(26,845)

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1918.

No. 759.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, AND ADDISON A. KEISER, APPELLANTS,

vs.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

APPEAL FROM THE DISTRICT COURT OF THE UNITED STATES FOR THE EASTERN DISTRICT OF MICHIGAN.

INDEX.

	Original.	Print.
Caption	*a*	1
Bill of complaint	1	1
Order extending time for return on order to show cause, &c.	21	14
Answer	23	15
Replication	35	23
Order appointing special master	37	24
Opinion on motion for preliminary injunction	39	25
Order continuing preliminary injunction conditionally	41	26
Bond of complainant in pursuance of order of court dated May 29, 1912	43	27
Order continuing restraining order	48	31
Præcipe for appearance	49	31
Motion for order permitting appearance	50	32
Stipulation regarding corporate and land-grant history	52	33

JUDD & DETWEILER (INC.), PRINTERS, WASHINGTON, D. C., APRIL 15, 1919.

	Original.	Print.
Memorandum order *in re* deposit in clerk's office of bank receipts, &c.	61	39
Order regarding fund to secure payment of refund coupons	66	42
Stipulation as to certain exhibits	70	44
Report of special master	74	46
Defendants' exceptions to report of special master	326	47
Complainant's exceptions to report of special master	357	71
Opinion, Sessions, J.	360	73
Final decree	376	90
Petition for and allowance of appeal and assignments of error	385	94
Citation and acceptance of service	401	103
Motion and order enlarging time for docketing appeal, &c.	403	105
Motion and order of September 13, 1918, extending time, &c.	409	109
Stipulation *re* exhibits, dated September 16, 1918	413	111
Clerk's certificate	415	113
Proof of service and praecipe for record and exhibits, &c.	415½	114
Statement by defendants for purpose of limiting record on appeal	1	125
Testimony of Henry Earle Riggs	11	129
John D. Stradley	215	246
Henry Hoffman	238	256
Edgar H. Hotchkiss	247	261
Roscoe C. Young	250	262
Ernest J. Dube	305	293
William D. Calverley	309	295
William P. Belden	312	297
Charles V. R. Townsend	362	326
William E. Mason	373	332
Joseph J. O'Connor	375	333
Arvo J. Vitali	376	333
August Hutula	377	334
August Wallen	378	334
John Campbell	380	335
Adolph W. Peterson	381	336
Jerome Brown	382	336
H. S. Thompson	383	336
Clerk's certificate to volume 1	386	338
Testimony of A. E. Delf	387	339
Merwin E. Astre	502	425
John Robertson	539	448
Charles F. Loweth	556	456
Albert H. Hogeland	585	474
James Maney	593	478
Chester J. McPherson	612	488
Nelson Cadarette	675	519
Charles Hansel	688	528
Testimony of Crescent A. Parker	787	577
Clerk's certificate to volume 2	892	648
Testimony of Henry C. Adams	893	650
Mortimer E. Cooley	949	683
F. L. Batchelder	992	708

		Original.	Print.
Testimony of	Henry R. Harris	1002	715
	Stephen Wood	1008	718
	Dias Wiseman	1016	723
	John Hager	1019	725
	Martin Ryan	1020	726
	Joseph Durocher	1023	727
	Charles E. Lytle	1025	728
	Morgan W. Jopling	1054	745
	Edward C. Anthony	1056	746
	Charles R. Lewis	1058	747
	Robert B. Rifenberick	1074	756
	Sumner G. Horton	1076	757
	Festus R. Metcalf	1108	779
	J. R. Davis	1110	780
	Fred M. Twiss	1124	789
	A. B. Hubbard	1134	795
	Charles M. Whiteside	1136	796
	Joseph L. McCheskey	1141	798
	William M. Snell	1143	799
	Charles E. Chipley	1147	801
	Charles Ripley	1150	803
	Ralph J. MacKenzie	1155	806
	William Pierce	1162	810
	Charles J. Johnson	1163	811
	James Kennaugh	1165	813
	L. J. Le Veque	1171	816
	F. J. Burtless	1172	817
	Thomas McCormick	1175	818
	Edward C. Cooley	1186	836
	Melville W. Thompson	1195	842
Clerk's certificate to volume 3		1323	913
Testimony of	Augustus C. Hone	1324	914
	Albert R. Dilley	1325	914
	Rolland C. Allen	1326	914
	Charles A. Lindsay	1350	927
	John B. Berry	1399	955
	Charles P. Howard	1434	975
	Wayland W. Walker	1450	985
	Ray Brotherton	1459	990
	Jacob P. Werner	1463	992
	F. J. Bachelder	1464	992
	Levi P. Atwood	1477	1001
	G. F. Bristol	1491	1015
	George L. Fowler	1495	1016
	Nelson Caderette	1497	1020
	A. E. Delf (recalled)	1512	1028
	R. C. Young (recalled)	1566	1058
	Edward S. Bice	1569	1060
	Charles F. Loweth (recalled)	1571	1061
	C. A. Parker (recalled)	1577	1065
	George E. Fisher	1639	1100

		Original.	Print.
Testimony of	L. C. Smith	1640	1100
	Hazeal J. Payne	1642	1101
	Elden E. Dadson	1646	1103
	Clement C. Williams	1659	1110
	Edmund J. Kates	1681	1123
	Edgar French	1684	1130
	Henry C. Adams	1686	1131
	C. W. Hillman	1694	1136
	W. W. Walker	1729	1156
Agreement to statement of evidence		1734	1159
Judge's approval of statement of evidence		1734	1159
Clerk's certificate to volume 4		1735	1159
Stipulation in regard to printing record		1736	1160
Complainant's Exhibit	33—Statements of mileage	1740	1163
	35—Statements of operating revenues (entire line)	1749	1167
	36—Statements of operating revenues (in Michigan)	1752	1170
	43—Mileage statement	1755	1173
	52—Statement of estimated loss by application of act 276	1757	1174
	53—Railroad mileage from report of Michigan Railroad Commission, 1910	1761	1179
	54—Statement of operations, &c.	1762	1180
	55—Five-year view of railroad income per mile	1765	1184
	67—(Extracts from) Statement of revenue train mileage, year ending June 30, 1913, &c.	1767	1185
	68—Statement of estimated loss by application of act 276	1771	1188
	201*a*—Valuation statement 1914	1774	1190
	201*b*—Valuation statement 1915	1775	1190
	201*c*—Valuation statement 1916	1776	1190
	220—Statement of operations in Michigan, June 30, 1914	1777	1191
	221—Computations of rate of return on property valuation	1783	1195

a UNITED STATES OF AMERICA:

In the District Court of the United States for the Eastern District of Michigan, Southern Division. In Equity.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, Morgan W. Joplin, John R. Van Evera, and Fred S. Case, Defendants.

Clerk's Return to Claim of Appeal in Above-entitled Cause from said Court to the United States Supreme Court.

1 1.

United States Circuit Court, Eastern District of Michigan, Southern Division. In Equity.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Complainant,

v.

FRANZ C. KUHN, CASSIUS L. GLASGOW, GEORGE W. DICKINSON, Lawton T. Hemans, John R. Van Evera, Morgan W. Jopling, and Fred S. Case, Defendants.

Bill of Complaint.

To the Judges of the Circuit Court of the United States for the Eastern District of Michigan:

Your orator, the Duluth, South Shore & Atlantic Railway Company brings this its bill of complaint against Franz C. Kuhn, a citizen of the State of Michigan and a resident of the County of Macomb, Cassius L. Glasgow, a citizen of the State of Michigan and a resident of the County of Barry, George W. Dickinson, a citizen of the State of Michigan and a resident of the County of Oakland, Lawton T. Hemans, a citizen of the State of Michigan and a resident of the County of Ingham, also, John R. Van Evera, Morgan W. Jopling and Fred S. Case, all citizens of Michigan residing in Marquette County and who are hereby made defendants, and thereupon your orator avers:

I.

Your orator is a consolidated railroad corporation duly created under the laws of the States of Michigan and Wisconsin, has its principal office at the City of Marquette in the State of Michigan, and is a common carrier of freight and passengers, and as
2 such is engaged in state and inter-state commerce, and owns, maintains and operates lines of railroad in the States of Michigan and Wisconsin, and in order to reach Duluth, operates its trains over a line of railroad of another company within the State of Minnesota. Its system of railroads, including its main line or lines and its branches, comprise about 584 miles of road owned by it, and 20.83 miles of road over which it operates its trains under agreement with other companies. About 475 miles thereof is situate within the State of Michigan. Its line extends from Sault Ste. Marie, Michigan, to Duluth, Minnesota, with a branch from Soo Junction in Luce County, Michigan, to St. Ignace, Michigan, and a branch from Nestoria, in Baraga County, to Houghton in Houghton County, Michigan, and other short branches in Michigan. It crosses the counties of Chippewa, Mackinac, Luce, Schoolcraft, Alger, Marquette, Baraga, Houghton, Ontonagon and Gogebic, in Michigan, thence westerly, from the westerly boundary of Gogebic County across the northerly portion of Wisconsin to the City of Superior, from which last named place it operates its trains as aforesaid over the line of another company to Duluth, Minnesota. The whole of its said railroad constitutes one system, and long has been, and now is, operated as such.

It has outstanding common stock of a par value of $12,000,000 and preferred stock of the par value of $10,000,000. Its outstanding bonds amount to $18,923,000 covering its entire system, and $1,077,000 covering its main line from Marquette, Michigan, to Houghton, Michigan, and its branch from Humboldt, Michigan, to Republic, Michigan, with the side tracks and other property appurtenant to such main line and branch line, being only about 104 miles of its road in Michigan. Its cars, engines, supplies and appliances are, for the most part used upon the system wherever required without regard to state lines. It is impossible to operate separately, with due regard to economy or the interests of the public, that portion of the system of your orator situate in any particular state. To a
3 great extent, the trains of your orator, whether freight or passenger, necessarily move between different states, and even when their movements are confined to one state, the same trains and the same cars carry both inter-state freight or passengers and intra-state freight or passengers. The principal business of your orator consists of interstate commerce, either wholly upon its own line, or jointly with other common carriers, and it is a carrier in such commerce subject to the exclusive jurisdiction, supervision and control of the Congress of the United States.

II.

The defendant, Franz C. Kuhn, is the Attorney General of the State of Michigan, duly elected, qualified and acting as such. The defendants Cassius L. Glasgow, George W. Dickinson and Lawton T. Hemans, are Commissioners constituting the Michigan Railroad Commission, duly appointed, qualified and acting as such under the general Statutes of said state creating such Commission. The above named defendants, John R. Van Evera, Morgan W. Jopling and Fred S. Case, and each of them are persons accustomed to use, and intending in the future to use, as passengers thereon, your orator's railroad between stations on said railroad within the State of Michigan. They represent a class of passengers within said state, most of whom are necessarily unknown to your orator, so numerous that it is impossible to join them all as parties hereto, and they are made defendants hereto for the purpose of determining the right of all passengers under Act 276 hereinafter referred to.

III.

Your orator represents that the Legislature of the state of Michigan, at its session in 1911, enacted Public Act No. 276, entitled "An Act to amend Sec. 9 of Act No. 198 of the laws of 1873, entitled 'An Act to revise the laws providing for the incorporation of railroad, bridge and tunnel companies, and to regulate the running and management, and to fix the duties and liabilities, of all railroad, bridge, tunnel and other corporations owning or operating any railroad, bridge or tunnel within this state,'" the section
4 amended being compiler's Sec. 6,234 of the Compiled Laws of the State of Michigan of the year 1897; and by the said Act 276, the said Legislature, among other things, enacted and provided that the tolls and compensation to be charged for transporting any passenger and his or her ordinary baggage, not exceeding in weight 150 pounds, should not exceed, for a distance of five miles, three cents per mile; and for all other distances for all companies the gross earnings of whose passenger trains, as reported to the Commissioner of Railroads for the year 1906, equalled or exceeded the sum of $1,200 per mile for each mile of road operated by any such railroad company on which regular passenger service is maintained, as thereinafter provided, two cents per mile; and for all companies whose earnings, reported as aforesaid, were less than $1,200 per mile of road operated by such company, three cents per mile. For children under twelve years of age a charge of one-half the above fares is provided. That the gross earnings of your orator's passenger trains, as reported to the Commissioner of Railroads of the State of Michigan for the year 1906, and for each subsequent year reported, exceeded the sum of $1,200 per mile for each mile of road operated by it within the State of Michigan on which regular passenger service was maintained. Such law, if valid, as to your orator and enforced against it, will make it unlawful for your orator to charge for the transportation of passengers within the State of Michigan more than

two cents per mile, whereas now it is, and hitherto has been, allowed to charge three cents per mile, and prior to September, 1907, it was allowed to charge four cents per mile.

IV.

This is a suit in equity arising under the Constitution of the United States, for that your orator seeks to enjoin the defendants above named, and each of them, from attempting in any manner to enforce against your orator the provisions of said Act 276
5 prescribing the rates, fares and charges for the transportation of passengers as aforesaid, or from instituting any action or proceeding against your orator, its officers, directors, agents or employes, for the violation of such provisions, for the reason that said Act, in so far as it attempts to prescribe as against your orator and compel it to accept the rates, fares and charges in said Act prescribed, is violative of the provisions of the fourteenth amendment to the Constitution of the United States, in that it will operate to deprive your orator of its property without due process of law, and to deny to your orator the equal protection of the laws. The matter in dispute in this suit exceeds, exclusive of interest and costs, the sum of $2,000.

V.

Said defendant Franz C. Kuhn, as Attorney General of the State of Michigan, threatens and intends to, and will, unless restrained by this court, take and institute proceedings against your orator, its officers, agents, servants and employees, to compel your orator and them to put into effect the rates, fares and charges prescribed in said Act 276, and to maintain and keep the same in effect. Said defendants Cassius L. Glasgow, George W. Dickinson and Lawton T. Hemans, as the Railroad Commission aforesaid, threaten to and will, in case your orator shall fail or refuse to put in effect, and to keep and maintain in effect, such rates, fares and charges, give to your orator the notification provided for in said Act 276; and in case your orator shall, within thirty days after such notification, fail or refuse to put in effect and maintain the rates, fares and charges, institute and cause to be instituted against your orator numerous actions, suits and proceedings for the purpose of enforcing against your orator the penalty of $500 per day for each and every secular day during the pendency of such failure as provided in said Act 276. They threaten to and will call upon the Attorney
6 General, or the Prosecuting Attorney of each county in Michigan through which your orator's road passes, to institute and prosecute actions, suits and proceedings to compel your orator to carry out and obey the provisions of said Act 276 with reference to rates, fares and charges, and to punish your orator by the enforcement of the penalties aforesaid.

Said defendants, John R. Van Evera, Morgan W. Jopling and Fred S. Case, are members of a class, as hereinbefore stated, each

of whom will be entitled, under the provisions of Sec. 6,235 of the Compiled Laws of the State of Michigan of 1897, to commence an action, on the refusal of your orator to carry him for the rates, fares and charges named in said Act 276, to recover the actual damage sustained by him by such refusal, or, at his election, a penalty of $100, and your orator believes and alleges that it will be harassed by, and subjected to, a multitude of such actions commenced to recover such penalties.

For the determination of the validity of said rates, fares and charges as applicable to your orator and its railroad, an examination of an immense number of complicated facts is necessarily involved. It is necessary to determine the value of your orator's entire property; its value in Michigan; the proportionate value of your orator's property used and to be used for the transportation of passengers, inter-state and intra-state, in Michigan; the total amount of the earnings of your orator allowable to its lines in Michigan; the amount of such earnings allowable to the freight business and to the passenger business in Michigan; the amount of earnings derived from transportation of passengers inter-state and intra-state in Michigan; and the apportionment of various miscellaneous items of earnings to the inter-state and intra-state passenger business in Michigan; the total amount of expenses for the operation of your orator's line;
7 the division of such operating expenses between the states in which your orator's lines are located; the division of such operating expenses between the freight and passenger business of your orator; the division of the passenger operating expenses in Michigan between the interstate passenger business and the intra-state passenger business; the apportionment of taxes paid in Michigan between the passenger business and the freight business of your orator in Michigan; the apportionment of the amount of taxes charged against the passenger business of your orator in Michigan between its intra-state and its interstate passenger business; together with other facts too numerous here to be stated, and the determination of which is most intricate and difficult, but all of which are necessary to be determined before it can be decided whether your orator will receive any or an adequate compensation from all its business, or from its intra-state passenger business in Michigan.

The accounting department of your orator's railroad has been, since the passage of Act 276, and is now, engaged in examining its accounts and determining the questions above suggested, and your orator is advised and believes, and so alleges the fact to be, that the profit from its business in Michigan will be so slight, if any, if it is compelled to accept a two cent per mile fare for the transportation of passengers, that it will amount to a confiscation of its property, and it brings this suit in good faith for a speedy and final judicial determination of the validity of the rates, fares and charges aforesaid as applicable to your orator and its railroad.

That the average number of passengers carried by your orator each day on its lines between stations in Michigan is about 1900, and there is no reason for believing that it will be less in the future, and if

your orator should be subjected to a penalty of $100, for each passenger whom it shall refuse to carry for two cents per mile, its liability will be about $190,000 per day, to say nothing of the $500 per day penalty hereinbefore referred to; and if such penalties shall
8 be enforced, the necessary result must be to deprive your orator of the right to have a judicial determination of the validity of the rates, fares and charges aforesaid, and it would thereby be deprived of its property without due process of law, and would be denied the equal protection of the laws, all in violation of the said fourteenth amendment of the constitution of the United States.

VI.

For many years immediately last past, the general basis of fares and charges for the transportation of passengers upon the lines of your orator in Michigan, whether for traffic local to Michigan or inter-state between Michigan and another state, or between points in Michigan and points in the Dominion of Canada, has been and now is three cents a mile (except for children entitled to half fare), which fares and charges have never been excessive or unreasonably high, but on the contrary, are, and always have been, so low as not to yield, over and above the cost of doing the business, any just or reasonable return to your orator on the fair, proportionate value of its property used in the conduct of its passenger business and properly assignable thereto.

The fares for all passengers traveling on your orator's line from points within the State of Michigan to points beyond its limits, whether reached by your orator's line or by the line of a connecting carrier, for a long time last past have been and now are generally arrived at and made by taking the sum of the local fares and charges, that is, by adding three cents per mile for each mile travelled in Michigan, (except children entitled to half fare) to the amount of the local fares for the other parts of the route. For example: Newberry, Michigan and Superior, Wis., are points on the main line of your orator's road 353.6 miles apart. The fare which is now and for a long time last past has been charged by your orator between said points is $9.50, arrived at as follows: 244.4 miles of such distance is within the State of Michigan, and
9 at three cents per mile amounts to $7.33; 109.2 miles of such distance is within the State of Wisconsin, which, at two cents per mile (the local rate in Wisconsin), amounts to $2.18.

The station of Montreal, in Gogebic County, Michigan, on your orator's line is near the Western boundary of Michigan, and 242 miles westerly from Newberry. If the fare prescribed by Act 276 shall be enforced, the fare from Newberry, Michigan, to Montreal, Michigan, can not exceed the sum of $4.84, which, added to the fare from Montreal to Superior, $2.18, amounts to $7.02, being $2.48 less than the present fare from Newberry, Michigan to Superior, Wis.

Again, Marquette, Michigan, and Lake Nebagamon, Wis., are

points on the main line of your orator's road. The present fare is $6.00, being three cents per mile for 147.9 miles in Michigan, and two cents per mile for 79.4 miles in Wisconsin. If said Act be enforced against your orator, the fare from Marquette, Michigan, to Montreal, Michigan, a distance of 145.5 miles, cannot exceed $2.91 and the fare from Montreal, Michigan, to Lake Nebagamon, Wis., at two cents a mile, would amount to $1.63, aggregating $4.54,—being $1.46 less than the present fare.

Still further: The present fare from the City of New York to Marquette, Michigan, via Mackinaw, is $25.33, made up as follows: The fare from New York to St. Ignace, Michigan, a terminus on your orator's line, is $20.80. The distance on your orator's line from St. Ignace to Marquette is 151 miles, which, at three cents a mile, amounts to $4.53. If the rates, fares and charges in said Act 276 be enforced against your orator, the fare from St. Ignace to Marquette can not exceed $3.02, which, added to $20.80, amounts to $23.82, a reduction of your orator's inter-state fare of $1.51.

The rates, fares and charges for the passenger business of your orator, made up of travel between points on your orator's line within the State of Michigan, and points beyond the limits of the State of Michigan, are made, filed and published in accordance with the requirement of the Act to regulate commerce and the amendments thereto, and are the only rates, fares and charges which may legally be applied to such passenger business. The direct and immediate effect of the installation of the rates, fares and charges prescribed in said Act 276 will be to deprive your orator of a substantial part of its inter-state passenger business between points on its line in the State of Michigan, and points beyond the limits of the State of Michigan, because the fares and charges for transportation of a passenger, a part of whose route is partly within and partly beyond the limits of Michigan, will then necessarily exceed the sum of the fares and charges for which such passenger may travel on local tickets. And while your orator is unable to learn definitely how much of its said inter-state passenger business will be so destroyed by the application of such rates, fares and charges on account of the purchase of local tickets on your orator's line between points in Michigan, being a part of inter-state travel, its officers believe, and so it avers the fact to be, that the amount thereof will be the greater part of its interstate passenger business.

The immediate, direct and necessary effect of the installation of the rates, fares and charges prescribed in said Act 276 will be to create unfair and unjust discrimination in favor of the passenger business of your orator local to the State of Michigan and against all its passenger business between Michigan and another state, or between Michigan and Canada, or which is made up of travel and routes partly within and partly beyond the limits of Michigan, and also unfair and unjust discrimination in favor of localities on your orator's line within the State of Michigan, and against localities beyond the boundaries of the State of Michigan.

The unavoidable effect of the reduction of the intrastate passenger

rates, fares and charges in said Act 276 prescribed to the business of your orator in Michigan, will be substantially to burden, and directly to regulate and to discriminate against, the inter-state passenger commerce of your orator, and to create undue and unjust dis-
11 crimination between localities in Michigan and those in other states, in violation of the commerce clause of the Constitution of the United States, and in violation of the Act of Congress to Regulate Commerce among the States and with Foreign Nations, and the amendments thereto, commonly known as the "Interstate Commerce Act."

VII.

The roads of your orator are well and *judicially* located, were built in obedience to public necessity, and are now, and always have been, well and economically operated. They are not equipped or constructed with reference to any other business than that which your orator is now doing, and that which it may reasonably expect to have within the near future.

Its property used in the conduct of its transportation business, is all located in the States of Michigan and Wisconsin. Its property used in the transportation business in the State of Wisconsin is reasonably of the value of not less than $2,430,000, and could not be reproduced for that sum.

Its property devoted to its transportation business within the State of Michigan is now, and for several years last past has been, actually, fairly and reasonably of the value of not less than $11,000,000 and could not be reproduced for that sum.

The proportionate value of its said property within the State of Michigan, which now and for some years past has been fairly and justly chargeable and assignable to the total freight business of your orator therein, does not exceed $7,400,000.

The proportionate value of said property within the State of Michigan which now and for some years past has been fairly and justly chargeable and assignable to the total passenger business of your orator in Michigan, is at least $3,600,000.

The proportionate value of its said property within the State of Michigan which now and for some years last past has been fairly and justly chargeable and assignable to the intrastate passenger business of your orator within Michigan, which is covered by the rates, fares and charges in said Act 276 prescribed, is at least $2,048,000.

The fiscal year ending June 30, 1910, may justly be taken
12 to be a fairly representative year, and a guide by which to determine what the net income of your orator from its various classes of business, as well as upon its entire railroad as from its business within Michigan, has been in recent years, and what the same will be in the future.

In said fiscal year the total operating revenue of your orator, both freight and passenger, including all miscellaneous earnings of every kind, did not exceed the sum of $3,302,147.03.

In said fiscal year the total operating revenue of your orator within the State of Michigan, both freight and passenger business,

including all miscellaneous earnings of every kind properly allowable to said state, did not exceed the sum of $2,896,602.50, of which not to exceed $1,940,388.04 was derived from, and assignable to, the freight department of the business in Michigan, and not to exceed $956,214.46 was derived from and assignable to, the passenger department of the business in Michigan, and not to exceed $539,502.50 was Michigan intra-state passenger earnings, including a just proportion of all miscellaneous earnings.

The total operating expenses and taxes in said year were not less than $2,491,778.16.

The total operating expenses and taxes properly chargeable to all of the business within the State of Michigan in said year, was not less than the sum of $2,120,950.09, of which operating expenses and taxes there was properly chargeable to the freight department of the business within Michigan not more than $1,419,536.38, and to the passenger department of the business in Michigan not less than $701,-413.71.

Of the total amount of the operating expenses and taxes properly chargeable to the passenger department of the business within Michigan in said year, there were properly chargeable to the intra-state passenger business in Michigan not less than $426,956.42.

The total net income, over and above operating expenses and taxes, derived from the total business of your orator of all kinds in
13 said year, including outside operations, rentals and hire of equipment, did not exceed the sum of $794,395.23.

The total net income over and above operating expenses and taxes derived from the total business of all kinds, including outside operations, rentals and hire of equipment, in Michigan in said year, did not exceed the sum of $770,694.92, and that derived from, and assignable to, the business of the passenger department in Michigan in said year did not exceed the sum of $256,920.10, and the total net income derived from the intra-state passenger business in Michigan in said year,—including a fair and just proportion of miscellaneous earnings, outside operations, rentals and hire of equipment,—did not exceed the sum of $113,740.14.

For many years prior to, and until 1907, your orator was by law allowed to charge four cents per mile for passenger travel in Michigan (except for children under twelve years of age). By a statute passed in 1907, taking effect in September of that year, this rate was reduced to three cents per mile.

Your orator has always transported children under the age of twelve years and clergymen on its line at one-half the regular fare, and has frequently granted excursion and party rates upon which large numbers of passengers have traveled at less than the regular fare, and competitive conditions have long existed, and will continue to exist, rendering it impossible for your orator to secure its maximum regular fares on certain of its business.

The number of passenger miles on your orator's whole line, and the average amount of revenue per passenger mile in each year ending June 30th, for the last four years, is as follows:

1907	40,284,349	$0.02662
1908	39,627,046	.02446
1909	37,924,125	.02413
1910	40,128,377	.02463

The number of passenger miles on your orator's line in Michigan, and the average amount of revenue per passenger mile in each year ending June 30th, for the last four years, is as follows:

14

1907	33,256,965	$0.02785
1908	32,438,206	.02590
1909	31,145,196	.02541
1910	32,813,258	.025432

In 1910 the total number of passenger miles in the intra-state passenger business of your orator in Michigan was 18,358,957, and the average revenue per passenger mile was .02563 cents, and the total number of inter-state passenger miles in Michigan was 14,454,-301, and the average revenue per passenger mile was .02518 cents.

There is no reason to believe that the passenger traffic on your orator's whole line, or its lines in Michigan, will increase substantially in the near future, for the reason that the territory served by such railroads in the northerly parts of Michigan and Wisconsin is sparsely settled, the population being in the Upper Peninsula of Michigan only about sixteen persons per square mile as against more than forty-two persons per square mile in the Lower Peninsula of Michigan, as your orator is informed and believes. If the rates, fares and charges prescribed in Act 276 be enforced against your orator, it will be impossible, because of the facts hereinbefore alleged, to secure an average of two cents per passenger mile upon its traffic in Michigan, and your orator believes that it will be impossible to secure more than one and eight-tenths cents per passenger mile. At the average revenue of one and eight-tenths cents per passenger per mile on the volume of traffic of 1910, the diminution of its revenue would amount to $243,868.13 per year in Michigan. Assuming that it would be possible to secure two cents per passenger per mile on the average, the diminution of revenue, on the volume of traffic in Michigan in 1910, would be, on interstate passenger business, $103,360.93, and on the inter-state passenger business, $74,873.28; making a total of $178,234.21. If the earnings of your orator's entire line for the year 1910 were reduced by the amount last above mentioned, the return on the entire value of your
15 orator's operating property would not exceed 4.59%, and if its total earnings in Michigan were reduced by the like sum, the return on the value of your orator's entire property in Michigan would be only 5.39%, and if the intrastate passenger earnings in Michigan be reduced $103,360.93, then the rate of return upon the proportionate value of your orator's property used in the conduct of such business and properly assignable thereto, would be less than .506%.

The cost of operation of your orator's lines has not declined within recent years, but, on the contrary, has advanced because of increase in the wages of all classes of laborers and other employes, and the advance in the price of many classes of material required for the operation of the road. The operating expenses per passenger per mile of all passenger business in Michigan, or of the Michigan intra-state passenger business, will not decline but will advance, as the officers of your orator believe and so it alleges the fact to be.

The condition of the property of your orator used in its transportation business for a long time has been—and will continue to be—such as to require large annual expenditures to make up depreciation of property, not formerly included in operating expenses or otherwise provided for, and also for betterments and additions required to enable your orator to discharge its duties to the public. Large sums of money have, in recent years, been taken from the operating income of your orator to make up for depreciation prior to 1907, and for additions and betterments.

Your orator has never paid any dividends upon any of its outstanding capital stock, and has only paid a comparatively small part of the interest accruing upon its bonds outstanding. The annual interest on such outstanding bonds is $859,700., amounting in the last five years to $4,298,500., but the annual payments on account thereof during such period of five years has been $255,420., except that in the year 1909 it paid $395,420., making the aggregate of all payments for the five years of $1,417,100.

16 The reduction of the rates, fares and charges prescribed by Act 276—even if the same be confined solely to the intra-state passenger business of your orator in Michigan,—will result in depleting its revenue so that it will not derive from such intrastate passenger business, over and above taxes and the fair or actual cost of doing the business, any fair or reasonable return upon the proportionate value of its property in Michigan necessary, for, and used in, the conduct of its intra-state passenger business therein which the rates, fares and charges prescribed in said Act specifically cover. Such rates, fares and charges as applicable to your orator and its business are unreasonable and too low, and the enforcement of the same against your orator will result in depriving it of its property without due process of law, and will deny to it the equal protection of the laws, in violation of the fourteenth amendment of the Constitution of the United States, and therefore the said Act is, as to your orator, null and void.

VIII.

Your orator has no remedy at law, and unless the defendants and each of them, be by a temporary restraining order restrained, and thereafter temporarily and permanently enjoined, as hereinafter prayed, it will suffer great and irreparable loss and damage.

IX.

In consideration whereof, and forasmuch as your orator is remediless in the premises by the strict rules of the common law, and can have relief only in a court of equity where matters of this kind are properly cognizable and relievable, and where only questions of this sort may properly be tried and determined,

Your orator prays, 1, That said Act of the Legislature of Michigan approved May 2, 1911—being Act No. 276 aforesaid,—insofar as it attempts to prescribe compensation for transporting passengers and their baggage at less than four cents per mile for a dis-
17 tance not exceeding ten miles, or less than three cents per mile for all other distances for passengers twelve years of age or more, and one-half those rates for children of twelve years or under, be declared and adjudged to be in violation of the Constitution of the United States, and therefore void and of no effect, so far as your orator, the Duluth, South Shore & Atlantic Railway Company, its officers, directors, agents and employes, are concerned:

2. That said Franz C. Kuhn, the Attorney General of the State of Michigan, be temporarily, until the final determination of this suit, and thereafter permanently, restrained and enjoined from instituting, or causing to be instituted, in the name of the state, his own name, as Attorney General or otherwise, any suit, action, or proceeding, to compel your orator, its officers, directors, agents or employes, to put in force, or to maintain or keep in force on the lines of your orator, any of the rates, fares or charges in said Act 276 prescribed, or for the recovery of any penalty on account of any failure or refusal on the part of your orator, its directors, officers, agents or employes, to put in force or to apply such rates.

3. That the defendants Cassius L. Glasgow, George W. Dickinson and Lawton T. Hemans, individually and as Commissioners constituting the Michigan Railroad Commission, be temporarily, until the final determination of this suit, and thereafter permanently, restrained and enjoined from in any manner enforcing or attemptig to enforce against your orator, its officers, directors, agents or employes, the rates, fares and charges prescribed in said Act 276, or attempting to enforce or collect any penalty on account that your orator fails or refuses to put in effect such rates, fares and charges, either by giving the notification referred to in subdivision Ninth of said Act, or by requesting or directing the Attorney General, or the Prosecuting Attorney of any County of the State of Michigan,
18. to institute or prosecute any suit, action or proceeding for the purpose of compelling your orator to put in force, or keep in force, the said rates, fares and charges, or by requesting or directing them, or either of them, to institute any action, suit or proceeding to collect or enforce any penalty for the refusal to put in force such rates, fares and charges.

4. And that the defendants John R. Van Evera, Morgan W. Jopling and Fred S. Case, and all other persons who desire to become passengers on your orator's railroad in Michigan, be temporarily and

permanently enjoined and restrained from demanding that the rates, fares and charges prescribed by said Act be given to them or any of them, and from asking, claiming or demanding, in or by any suit, action or proceeding whatsoever, any damages or penalty from or against your orator, its officers, directors, agents and employes or employe, on account of any failure or refusal to give them or either of them, or to put in effect and maintain the said rates, fares and charges;

5. And that your orator have such other and further relief as may be meet and proper, and conformable to equity.

6. And may it please your Honors to grant unto your orator a writ of subpœna of the United States of America, issuing out of and under the seal of this Honorable Court, directed to the said Franz C. Kuhn, Cassius L. Glasgow, George W. Dickinson, Lawton T. Hemans, John R. Van Evera, Morgan W. Jopling, and Fred S. Case, commanding them, and each of them, on a day certain therein to be named, and under a certain penalty, to be and appear before this Honorable Court, then and there to answer, but not under oath (answer under oath being expressly waived), all and singular the premises, and to stand to, and perform, and abide by such order, direction and decree, as may be made against them in the premises.

7. And that pending the hearing on the application for interlocutory injunction under the provisions of the Act of Congress approved June 18, 1910, a temporary order may be issued re-
19 straining the said defendants, and each of them, as above prayed.

And your orator will ever pray.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY,
By ARCH B. ELDREDGE,
Its Vice-President.

A. B. ELDREDGE,
Marquette, Mich.;
PIERCE BUTLER,
St. Paul, Minn.,
Solicitors for Complainant.
JARED HOW,
WILLIAM D. MITCHELL,
Of Counsel, St. Paul, Minn.

20 STATE OF MICHIGAN,
County of Marquette, ss:

I, Arch B. Eldredge, on oath, say that I am a Director, the Vice-President and General Attorney of the Duluth, South Shore & Atlantic Railway Company, the complainant above named, and one of its Solicitors herein; that I have read the foregoing bill of complaint, and know the contents thereof; that the same is true of my own knowledge, except as to those matters therein stated upon informa-

tion and belief, and as to those matters I believe it to be true; that I have subscribed the said bill and made this verification by authority from the said complainant.

ARCH B. ELDREDGE.

Subscribed and sworn to before me this 24th day of July, 1911.
[NOTARIAL SEAL.] W. J. ELLISON,
Notary Public in and for said County.

My commission expires Jany. 27th, 1912.

Filed July 26th, 1911.
MARTIN J. CAVANAUGH, *Clerk.*

21 2.

Order Extending Time for Return on Order to Show Cause, etc.

At a Session of the Circuit Court of the United States for the Eastern District of Michigan, Continued and Held, Pursuant to Adjournment, at the District Court-room, in the City of Detroit, in said District, on Tuesday, the Twenty-sixth Day of September, in the Year of our Lord One Thousand Nine Hundred and Eleven.

Present: The Honorable Loyal E. Knappen, United States Circuit Judge; the Honorable Arthur C. Denison, United States District Judge, and the Honorable Alexis C. Angell, United States District Judge.

No. 4117.

THE DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Complainant,

vs.

FRANZ C. KUHN, CASSIUS L. GLASGOW, GEORGE W. DICKINSON, Lawton T. Hemans, John R. Van Evera, Morgan W. Joplin and Fred S. Case, Defendants.

In this cause on reading and filing stipulation by and between counsel for respective parties, and on motion of A. B. Eldredge, Esq., solicitor for complainant, and Franz C. Kuhn, solicitor for defendants named, it is by the court now here ordered that the hearing upon the order to show cause, made and entered herein on the 26th day of July, A. D. 1911, by the Honorable Alexis C. Angell, District Judge, be and the same is hereby adjourned until the 16th day of January, A. D. 1912, unless the so-called Minnesota Rate Case, now pending in the Supreme Court of the United States and set for hearing on the 10th day of October, A. D. 1911, shall have been sooner decided, in which case either party shall be at liberty to move the court to advance the day of hearing.

22 And it is further ordered, in accordance with said stipulation, that the restraining order issued on the said 26th day of July, A. D., 1911, by the said Honorable Alexis C. Angell, District Judge, shall be continued in force until the hearing above provided for.

And it is further ordered, that after the 20th day of October, A. D., 1911, the said Complainant issue to each person buying Michigan intra-state passenger transportation, a receipt, certificate, or agreement, in form approved by the Attorney General of the State of Michigan, by which it binds itself to refund any amount paid for such transportation in excess of two cents per mile, and in case of children under twelve years of age in excess of one cent per mile, if this court shall finally decree that the rates, fares and charges provided for in Act of the Legislature of the State of Michigan, approved May 2nd, 1911, and known as Act number 276 of that year, is valid and enforceable against the said Complainant.

(Sgd.) LOYAL E. KNAPPEN,
United States Circuit Judge.

(Sgd.) ARTHUR C. DENISON,
United States District Judge.

(Sgd.) ALEXIS C. ANGELL,
United States District Judge.

23 3.

Answer.

UNITED STATES OF AMERICA:

The Circuit Court of the United States for the Eastern District of Michigan, Southern Division. In Equity.

No. 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Complainant,

vs.

FRANZ C. KUHN, CASSIUS L. GLASGOW, GEORGE W. DICKINSON, Lawton T. Hemans, John R. Van Evera, Morgan W. Jopling and Fred S. Case, Defendants.

The defendants Franz C. Kuhn, Cassius L. Glasgow, George W. Dickinson and Lawton T. Hemans, reserving to themselves all right of exception to the said bill of complaint, and without intent to represent or to answer for or to bind the state of Michigan in any way, for answer thereto say:

(1) That they admit the things stated in paragraph I of said bill of complaint to be substantially true as therein set forth, except that they have no knowledge or information upon whether the principal business of the complainant consists of inter-state commerce, but leave the complainant to its proofs with regard thereto.

(2) That they admit the statements contained in paragraph II of said bill of complaint to be substantially true as therein made, except that they have no knowledge with regard to the three defendants, John R. Van Evera, Morgan W. Jopling and Fred S. Case or the facts stated with reference to such defendants, but that they believe, upon such information as they now have, the things stated with regard to the said defendants to be true.

(3) That they admit the statements contained in paragraph III of said bill of complaint to be substantially true as
24 therein made, except that for distances in Michigan not exceeding five miles three cents per mile may under said Act 276 of the Public Acts of 1911, be charged for the carriage of passengers over twelve years of age, and one-half of that amount for children of the age of twelve years or under.

(4) That they admit that if this proceeding is properly instituted and is not a suit against the state of Michigan, it is a suit in equity arising under the Comstitution of the United States, and that the matter in dispute exceeds, exclusive of interests and costs the sum of $2,000, but that they deny that said Act 276 of the Public Acts of 1911, is violative of the provisions of the Fourteenth Amendment to the Constitution of the United States or that it will operate to deprive the complainant of its property without due process of law, or to deny to it the equal protection of the laws, and aver that the said act is constitutional and valid.

(5) That they admit that the said defendant Franz C. Kuhn, intends to and will, unless restrained, proceed against the complainant and its representatives to compel it and them to put and keep in effect the rates, fares, and charges prescribed in said act; that he admits that the defendants, Glasgow, Dickinson and Hemans will give (and have already given) to complainant the notice provided for in said act in case the complainant fails or refuses to put into effect and maintain the said rates, fares and charges, and will cause proceedings to be instituted for the recovery of the penalty provided for by statute; that they admit that persons entitled to travel over said railroad of complainant at the rates, fares and charges fixed in said act, are entitled in case of refusal to carry at such rates and charges, to proceed against the complainant for the penalty fixed by statute for the refusal to carry at such rates and charges; that they believe that the persons named are members of
25 the class entitled to bring such proceedings, though they have no direct information thereon, but that they deny that the complainant will be harassed by or subjected to, a multitude of such actions commenced to recover penalties; that they admit that the determination of the validity of the rates, fares and charges where the validity is contested involves the examination of a large number of complicated facts, and that in order to say positively that such rates are sufficient and accord to the complainant a fair return upon the value of its property, it is essential to determine and know the value of complainant's entire property, its value in Michigan, the proportionate value thereof used and to be used for the transportation of inter-state and intra-state passengers in Michigan, the amount

of earnings accruing to the complainant upon its line in Michigan, and the amount thereof derived from inter-state and intra-state transportation in Michigan respectively, the detailed amount of expenses for the operation of complainant's line and the division thereof between the states in which such line is located, together with numerous other facts and things bearing upon the amount of complainant's property in Michigan and the amount of earnings which will be permitted thereon from the intra-state business, all of which are necessary to be determined before it can be decided that the complainant will not receive any or adequate compensation from all of its business or from its intra-state business in Michigan, but that they deny that it is essential to ascertain and determine the amount of earnings allowable to the freight and passenger business in Michigan as separate and distinct items, the amount of earnings derived from the transportation of intra-state and inter-state passengers in Michigan separate from the earnings derived from all transportation in Michigan or the apportionment of various miscellaneous items to the inter-state and intrastate passenger business in
26 Michigan or the division of the operating expenses between the freight and passenger business of the complainant or the division between the inter-state and intra-state passenger business separate and apart from the entire intra-state business of the complainant in Michigan, or the apportionment of taxes paid in Michigan between the passenger business and the freight business of complainant in Michigan, or the apportionment of the amount of taxes charged against the complainant in Michigan between its intra-state and inter-state business as separate items from its entire intra-state business including both freight and passenger business in Michigan, but avers that the question for determination in ascertaining the reasonableness of the rates, fares and charges permitted to be charged by the complainant involves the inquiry of whether upon the entire property of the complainant devoted to its intra-state transportation and from business in Michigan a fair and sufficient return will be paid.

That they have no knowledge or information as to the examination which is being conducted by the accounting department of the complainant's railroad, but believe that such examination is being conducted, and that they deny that the profit from the complainant's business in Michigan will be so slight that the carriage of passengers at the rates fixed in said Act 276 of the Public Acts of 1911, will amount to a confiscation of its property.

That they deny that the average number of passengers carried by complainant daily on its line between stations in Michigan is about 1900, and that there is no reason for believing that it will be less in the future, but deny that if the complainant is in good faith and for the preservation of what defendant's representatives honestly believe to be its rights, institutes an inquiry or proceeding to determine the sufficiency of the rates, fares and charges, it would be subjected to a penalty of $100.00 a day to each passenger whom

27 it shall refuse to carry at two cents per mile, and deny that its liability therefore will be $190,000 per day, and deny that the necessary result of such penalty will be to deprive complainant of the right to a judicial determination of the validity of said rates and charges, or that it would therefore or thereby be deprived of its property without due process of law, or be denied the equal protection of the laws.

(6) That in so far as the said bill refers to the basis for fixing rates, fares and charges for the transportation of passengers as being three cents per mile, and in so far as it refers to specific fares between the points designated in the said paragraph or refers to the assignment now made of the revenues upon inter-state traffic between Michigan and other states or to the propriety of such assignment as is made in said bill, they have no knowledge, information or belief, but leave the complainant to its proofs with regard thereto, except that they aver and charge that the direct or necessarily incidental result of the said reduction of rates will not be to reduce to any extent the inter-state rates, and that the laws of Michigan since 1907 have fixed three cents per mile as the rate for the carriage of passengers, except children entitled to travel at half fare within the territory traversed by the complainant's lines, and that before 1907 four cents per mile was the charge permitted by statute, and they deny that such rates, fares and charges have never been excessive or unreasonably high and that they have always been so low as not to yield, over and above the cost of doing the business, any just or reasonable return to complainant on the fair proportionate value of its property used in the conduct of its passenger business and properly assignable thereto.

That they admit that the rates, fares and charges for the passenger business of the complainant made up of travel between
28 points on its line within Michigan and points beyond the limits of Michigan are made, filed and published in accordance with the requirements of the act to regulate commerce as amended, and are the only rates, fares and charges which may be legally applied thereto; they deny that the direct and immediate or necessarily incidental effect of the installation of the said rates, fares and charges so prescribed in said Act 276 will be to deprive complainant of a substantial part or any part, of its inter-state passenger business between points on its line in Michigan and points outside of Michigan, for the reasons stated in said bill or for any other reason and deny that a large part or any part of the complainant's inter-state passenger business will be destroyed, or the earnings therefrom decreased, by the application of the rates, fares and charges fixed in said act 276, or that the amount thereof will be the greater part of its interstate passenger business, or that if the said complainant is forced by the application of said act to carry any or all of its interstate passenger business at lower rates than it now receives therefor, that such reduction constitutes or will constitute a valid objection to the validity of said act.

That they deny that the immediate, direct and necessary or necessarily incidental effect of the installation of the rates, fares and

charges prescribed in said act 276 will be to create unfair and unjust discrimination in favor of the passenger business of complainant local to the state of Michigan, and against all its passenger business between Michigan and other states, or between Michigan and Canada, or which is made up of travel and routes partly within and partly without said state, or that the same will constitute unfair and unjust discrimination in favor of localities on complainant's line within Michigan, and against localities outside thereof.

That they deny that the unavoidable effect of the reduction
29 of the intra-state passenger rates, fares and charges in said act 276 prescribed, upon the business of the complainant in Michigan will be substantially to burden and to discriminate against the inter-state passenger commerce of complainant, or create undue and unjust discrimination between localities in Michigan and those in other states in violation of the said Constitution or laws of the United States.

(7) That the statements contained in paragraph VII of the said bill relate, for the most part, to matters not within the knowledge of the defendants, and with regard to which they have no information, but which are peculiarly and particularly within the knowledge of the complainant; that the statements made in such paragraph depend largely, and almost entirely, upon facts, accounts and figures in the possession and under the control of the complainant, and to which these defendants have not had, nor been offered, access as original sources of information; that the knowledge of the truth of the statements made in said paragraph depend almost entirely upon the examination of intricate and compiicated accounts which are only in the possession of the complainants and upon the making of extensive examinations of the complainant's books, papers and property; that none of these defendants have ever made, and have not been given leave by the complainant to make, such examination, and they have not, since the filing of said bill had any opportunity to make the same; that the only information which these defendants have with regard to the statements made and the facts upon which the same are based is that which is derived from the reports made by the said complainant to public officials and that resulting from examinations of its property made a number of years ago by the representatives of the state for the purpose of placing values thereon for taxation in Michigan, and that they believe upon such examination and knowledge so acquired that many of the statements made in said paragraph
30 are untrue both as statements of facts and as conclusions drawn therefrom; that they believe from such examination as they have been able to make and charge the truth to be that the statements contained in said paragraph, whether taken separately or collectively, do not fully or fairly represent the facts or state the truth; that the things and conclusions stated in said paragraph are in all instances stated in such a manner as to appear to be, and to be, of the most advantage to the complainant, and that many things might properly be and should be added to the statements made and things stated which, if stated, would change the character, import and effect of those stated, and for those reasons these defendants deny each and

all of the statements contained in the said paragraph numbered VII of said bill, and leave complainant to its proofs with regard thereto.

That in addition the defendants specifically deny that the value of the complainant's property devoted to its transportation business in Michigan is now and for several years last past has been actually, fairly and reasonably of the value of $11,000,000, or that the same could not be reproduced for that sum if proper allowance were made for depreciation, and deny that the proportionate value of the complainant's property within Michigan which now and for some years past has been, fairly chargeable and assignable to the total passenger business of complainant in Michigan, is at least $3,600,000, and deny that the proportionate value of its said property within the state of Michigan which now and for some years past has been fairly and justly chargeable and assignable to the intra-state passenger business of complainant within Michigan which is covered by the rates, fares and charges in said act 276 prescribed, is at least $2,048,000, and deny that the total operating revenue of the
31 complainant, both passenger and freight including all miscellaneous earnings of every kind, did not for 1910 exceed the sum of $3,302,147.03, or that the revenues in Michigan did not exceed $2,896,602.50, or that the said revenue is in said paragraph properly assigned between the freight and passenger business of the complainant in Michigan or between the inter-state and intra-state passenger business of the complainant in Michigan, and deny that in said year the total operating expenses and taxes of the complainant equaled $2,491,778.16, or that the same are properly assigned in said paragraph to the Michigan business, or between the freight and passenger business in Michigan or between the inter-state and intra-state passenger business in Michigan, and they deny that the total net income over and above operating expenses derived from the total business of complainant, including outside operations, rental and hire of equipment did not exceed $794,395.23, or that said net income is in said paragraph properly assigned to Michigan in the sum of $770,694.92, and that the true income in Michigan did not exceed that sum, and that the net income is properly assigned in said paragraph between the passenger and freight departments in Michigan, or between the inter and intra-state passenger business in Michigan, and that the total net income derived from the intra-state passenger business in Michigan including a fair and just proportion of miscellaneous earnings, outside operations, rentals, and hire of equipment, did not exceed $113,740.14; that they deny that there is no reason to believe that the passenger traffic on the complainant's lines in Michigan will increase substantially in the near future for the reasons stated in said paragraph or for any other reasons, or that upon the rates, fares and charges prescribed in said act 276, it will be impossible to secure an average of two cents per passenger mile upon its traffic in Michigan, or more than 1.8 cents per passenger mile, and deny that the putting into effect of
32 said rates will result in the diminution of revenue stated in said paragraph or of any diminution of revenue, but that

these defendants believe that the putting into effect of said rates will result in an increase in the number of passengers carried, sufficient to offset any loss by the reduction of rates, upon the number of passengers now carried, and deny that the putting into effect of said rates will result in such a reduction of complainant's revenues from its intrastate passenger business that it will not derive from such business after the payment of taxes and expenses of doing such business, any fair or reasonable return upon the proportionate value of its property in Michigan necessary for and used in the conduct of its intra-state passenger business, and deny that such rates, fares and charges as applicable to complainant and its business are unreasonable or too low or that the enforcement of the same against complainant will deprive it of its property without due process of law, or deny to it the equal protection of the laws or violate the Fourteenth Amendment.

That they admit that the complainant was, prior to 1907, by law permitted to charge four cents per mile for passenger travel, in Michigan, except for children under the age of twelve years, and that a statute taking effect in September 1907, reduced this rate to three cents per mile; that complainant has always transported children under the age of twelve years and clergymen at one-half the regular fare, and has given excursion and party rates to a considerable number of passengers at less than the regular fare, and that competitive conditions have existed which have rendered it impossible for the complainant to secure its maximum regular fares on certain of its business, but denies that said competitive conditions will be such as to require the complainant in future to carry any of its passengers, except children, at less than two cents per mile as prescribed by statute.

33 That they aver that the fair and reasonable value and cost of reproduction and allowing for depreciation, of the property of complainant, devoted to its business in Michigan, is the sum of $9,600,000; that the rates permitted to complainant in Michigan will pay an ample and sufficient return thereon after the payment of all expenses properly chargeable against the same, and that the earnings upon its passenger business at the rates fixed in act 276 will be ample and sufficient to pay a fair and reasonable return upon the value of such portion of the complainant's property in Michigan as is devoted to its intra-state passenger business.

(8) That they deny the statements contained in paragraph VIII of said bill.

(9) These defendants further answering, respectively represent and show;

(*a*) That this proceeding is in effect a suit against the State of Michigan, and that he, whether as Attorney General or member of the railroad Commission, has no personal interest in the said statute or in the subject matter of said bill, except as an officer of and representing the state of Michigan.

(*b*) That the said rates permitted by said act to be charged for the carriage of passengers are, together with the other moneys and

income permitted to be earned by the complainant in Michigan, sufficient to constitute a fair and sufficient return upon the value of its property in Michigan devoted to the public service and upon the property engaged in its passenger business, and that the said act 276 of 1911 fixing rates for the carriage of intra-state passengers within the state of Michigan at two cents per mile is valid, legal and constitutional.

(*c*) That by reason of the reduction of passenger fares upon the line of the said complainant in Michigan from the sum of
34 three cents per mile as heretofore to two cents per mile, will result in stimulating the traffic and so increasing the business of complainant within the state of Michigan as to make up for any loss which may result upon specific passengers from the reduction to two cents per mile, and that a fair trial of the said rates by putting them into effect will, in the judgment of each of these defendants, demonstrate that said reduction will result in an increase rather than a decrease of earnings from the passenger business.

(*d*) That said complainant has not stated such a case as entitles it to the relief prayed for, and that the said bill should be dismissed with costs.

FRANZ C. KUHN.
C. L. GLASGOW.
G. W. DICKINSON.
LAWTON T. HEMANS.

FRANZ C. KUHN,
GEORGE S. LAW,
ROGER I. WYKES,
Solicitors for Defendants.

Filed Dec. 2, 1911.

M. J. CAVANAUGH, *Clerk*.

35 4.

UNITED STATES OF AMERICA:

The Circuit Court of the United States for the Eastern District of Michigan, Southern Division. In Equity.

No. 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Complainant,

vs.

FRANZ C. KUHN, CASSIUS L. GLASGOW, GEORGE W. DICKINSON, Lawton T. Hemans, John R. Van Evera, Morgan W. Jopling and Fred S. Case, Defendant-.

The Replication of the Duluth, South Shore & Atlantic Railway Company, Complainant, to the Answer of the Defendants Franz C. Kuhn, Cassius L. Glasgow, George W. Dickinson, and Lawton T. Hemans.

This repliant, saving and reserving to itself all and all manner of advantage of exception, which may be had and taken to the manifold errors, uncertainties, and insufficiencies of the answer of the said defendants, for replication thereunto, saith, that it doth and will aver, maintain, and prove its said bill to be true, certain and sufficient in the law to be answered unto by the said defendants, and that the answer of the said defendants is very uncertain, evasive, and insufficient in law, to be replied upon by this repliant; without that, that any other matter or thing in the said answer contained, material or effectual in the law to be replied unto, confessed or avoided, traversed or denied, is true; all which matters and things this
36 repliant is ready to aver, maintain, and prove as this honorable court shall direct, and humbly prays as in and by its said bill it has already prayed.

A. B. ELDRDEDGE,
PIERCE BUTLER,
Solicitors for Complaint.

Dated, December 22, 1911.

Filed, Dec. 26, 1911.

MARTIN J. CAVANAUGH, *Clerk.*

37 5.

In the District Court of the United States, Eastern District of Michigan, Southern Division. (In Equity.)

(Former C. C. No. 4117.)

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Complainant,

vs.

FRANZ C. KUHN, CASSIUS L. GLASGOW, GEORGE W. DICKINSON, Lawton T. Hemans, John R. Van Evera, Morgan W. Jopling and Fred S. Case, Defendants.

Order Appointing Special Master.

This cause came on for hearing on the 17th day of May, 1912, upon the motion of complainant that a Special Master be appointed and that a time for taking the testimony herein be fixed. Mr. A. B. Eldredge, Mr. Pierce Butler appeared for the complainant. Mr. Franz C. Kuhn, the Attorney General, and Mr. Roger E. Wykes appeared for the defendants, and after hearing the parties and due consideration, it is ordered that Herbert L. Baker, of Detroit, Michigan, be and he is hereby appointed Special Master in Chancery in this case.

The Special Master hereby appointed is empowered and directed to take and report to the Court the evidence in this cause.

The Special Master hereby appointed is empowered and directed to examine the evidence, to make the necessary computations, and to find and state the facts in this case, and to make a report to this Court of the facts so found and of the results of such computations, and to recommend to the court in his report a form of a proper decree herein, all pursuant and subject to the rules and practice in equity.

It is further ordered that, upon the completion of his findings of fact and report, the Special Master shall notify counsel for the respective parties thereof, and shall exhibit said report to them, and shall deliver to them copies thereof, that each of the parties to this suit may thereupon file exceptions to the report with the Master within thirty (30) days after notice of its completion, and the Master shall thereupon consider and sustain or overrule each of said
38 exceptions, and shall thereafter return to the Court his report, the said exceptions, his rulings thereon, and any modifications of or additions to his report he may deem it just and proper to make, in view of such exceptions.

Upon the filing of such report and exceptions, the cause shall stand for hearing before the Court upon the said exceptions, as though they had been made at the time specified in Rule 83 in Equity, but further exceptions may be filed by any party to the suit within one month from the time of the return of said report to the Court.

It is further ordered, that the time in which complainant shall take its evidence in support of its bill is fixed at and limited to ninety (90) days from the date hereof; that the time within which the defendants shall take their evidence in defense herein is fixed at and limited to one hundred twenty (120) days thereafter; that the time within which the complainant shall take its evidence in rebuttal is fixed at and limited — thirty (30) days after the closing of the testimony for the defense and notice thereof in writing.

And it is further ordered, that the Master may appoint subject to the approval of the parties, a stenographer or stenographers, who shall be authorized to take and transcribe under the direction of the Special Master, the testimony in this case.

ALEXIS C. ANGELL,
District Judge.

Dated Detroit, Michigan May 17th, 1912.

Filed May 17th, 1912.
ELMER W. VOORHEIS, *Clerk.*

39 6.

Opinion on Motion for Preliminary Injunction.

In the District Court of the United States for the Eastern District of Michigan, Southern Division. In Equity.

No. 4117.

THE DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Complainant,

vs.

FRANZ C. KUHN, Attorney General of the State of Michigan, et al., Defendant-.

Before Knappen and Denison, Circuit Judges, and Angell, District Judge.

The judges who heard this motion think it probable that the decision of the Supreme Court in the pending so-called, Rate Cases, including Minnesota and Kentucky cases, will be instructive, if not controlling, as to the proper disposition of this motion. The Supreme Court will announce decisions on June 10th next, and it seems to us advisable to delay until after that date any decision upon the questions argued here. Whether our decision should be then further delayed in case the Supreme Court does not dispose of the Rate Cases on June 10th, we then can consider.

The restraining order will for the present be continued until June 28th next. This continuation, and any further continuations, will be upon two conditions: The first condition will be that the Complainant will speed the cause by proceeding with its testimony as

rapidly as may be. The second condition will be that the payment of the receipts which the Railroad Company is now issuing under our previous order for the excess over two cents per mile (and one cent in the case of children), be secured by filing in this cause
40 a bond in the sum of Two Hundred Thousand Dollars ($200,000) so that any holder of these excess certificates may resort through this court to such bond.

Dated Detroit, Mich., May 29th, 1912.

LOYAL E. KNAPPEN,
Circuit Judge.
ARTHUR C. DENISON,
Circuit Judge.
ALEXIS C. ANGELL,
District Judge.

Filed May 29th, 1912.
ELMER W. VOORHEIS, *Clerk.*

41 7.

Order Continuing Preliminary Injunction Conditionally.

At a Session of the District Court of the United States for the Eastern District of Michigan, Continued and Held, Pursuant to Adjournment, at the District Court-room, in the City of Detroit, in said District, on Wednesday, the Twenty-ninth Day of May, in the Year of Our Lord One Thousand Nine Hundred and Twelve.

Present: The Honorable Loyal E. Knappen, Circuit Judge; the Honorable Arthur C. Denison, Circuit Judge; the Honorable Alexis C. Angell, District Judge.

In Equity.

No. 4117.

THE DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY,
Complainant,

vs.

FRANZ C. KUHN, Attorney General of the State of Michigan, et al.,
Defendants.

The court having by an order entered on September 26th 1911 extended the operation of the restraining order entered herein on July 26th 1911 upon condition, which has since been fulfilled, that the Complainant should issue to each person buying Michigan intrastate passenger transportation, a receipt, certificate or agreement, in form approved by the Attorney General of the State of Michigan, by which it should bind itself to refund any amount paid for such transportation in excess of two cents per mile, and in case of children under twelve years of age any amount in excess of one cent per mile,

if this court should finally decree that the rates, fares and charges provided for in Act 276 of the Public Acts of the State of Michigan for 1911 are valid and enforceable against said Complainant; arguments upon the propriety of issuing an interlocutory injunction having been heard; and a decision not having as yet been handed down by the Supreme Court of the United States in the case mentioned in said order of September 26th, 1911.

42 It is by the Court Ordered that the restraining order heretofore issued and continued as aforesaid, be further continued until June 28th next upon the following conditions, viz: First, that the taking of testimony by the Complainant in said cause proceed with all reasonable speed; and Second, that, in addition to the issuance of the receipts, certificates or agreements to passengers, within twenty days from this day the Complainant file a bond in the full sum of Two Hundred Thousand Dollars ($200,000) with sufficient surety or sureties, to be approved by the Clerk of this court, and to run to the said Clerk for the benefit of the holders of such receipts, certificates or agreements, and conditioned that within such time and under such conditions as the court may hereafter order, the Complainant shall pay into court the full amount of such receipts, certificates or agreements as may be filed or presented in this court under the provisions of any order hereafter, entered herein.

LOYAL E. KNAPPEN,
Circuit Judge.

ARTHUR C. DENISON,
Circuit Judge.

ALEXIS C. ANGELL,
District Judge.

Filed May 29th, 1912.

ELMER W. VOORHEIS, *Clerk.*

43 8.

(Indorsement:) U. S. District Court, Eastern District of Mich., Southern Division, In Equity. Duluth, South Shore & Atlantic Ry. Co., Complainant, vs. Franz C. Kuhn, et al., Defts. Bond of Complainant in pursuance of Order of Court, dated May 29, 1912. Filed June 13th, 1912, at — o'clock — M. (Signed) Elmer W. Voorheis, Clerk.

44 District Court of the United States for the Eastern District of Michigan, Southern Division. In Equity.

No. 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Complainant,

vs.

FRANZ C. KUHN, Attorney General of the State of Michigan, et al., Defendants.

Know all men by these presents, That we, The Duluth, South Shore & Atlantic Railway Company, a corporation organized under the general railroad laws of Michigan, as principal, and Maryland Casualty Company, a corporation organized under the laws of Maryland, as surety, are held and firmly bound unto Elmer W. Voorheis, Clerk of the U. S. District Court for the Eastern District of Michigan, Southern Division, in the sum of Two Hundred Thousand Dollars ($200,000), lawful money of the United States, to be paid to the said Elmer W. Voorheis, or to his lawful successor in office, for the use and benefit of the holders of all receipts, certificates or agreements, hereinafter more particularly described; for which payment, well and truly to be made, we bind ourselves, our and each of our successors; jointly and severally, firmly by these presents.

Sealed with our seals, dated the sixth day of June, one thousand, nine hundred and twelve.

Whereas, the above bounden Duluth, South Shore & Atlantic Railway Company, on July 26, 1911, commenced a suit in Equity, in the Circuit Court (now District Court) of the United States for the Eastern District of Michigan, Southern Division, against the above named defendants, to enjoin the enforcement of Act No. 276 of the
45 Public Acts of 1911 of the Legislature of Michigan, approved May 2, 1911, as against said complainant; and,

Whereas, on July 26, 1911, the said Court entered an order restraining, until the further order of the Court, the said defendants from enforcing, or attempting to enforce in any manner, the provisions of said Act against said complainant, reference to which said restraining order, now on file in said Court, is hereby made for greater particularity; and,

Whereas, the said Court, by an order entered in the above entitled cause on September 26, 1911, extended the operation of said restraining order until January 16, 1912, upon condition, which has since been fulfilled, that the complainant therein should issue to each person buying Michigan intrastate passenger transportation a receipt, certificate or agreement in form approved by the Attorney General of the State of Michigan, by which it should bind itself to refund any amount so paid for such transportation in excess of two cents per mile, and in case of children under twelve years of age any amount in excess of one cent per mile, if the said Court should finally

decree that the rates, fares and charges provided for in said Act 276 are valid and enforceable against said complainant; and,

Whereas, on January 16, 1912, the said Court entered a further order continuing the said restraining order until May 29, 1912; and,

Whereas, on May 29, 1912, the said Court entered a further order continuing the said restraining order until June 28, 1912, upon certain conditions therein set forth, including the filing of this bond:

Now, therefore, the condition of this obligation is such, That if the above bounden Duluth, South Shore & Atlantic Railway Company, within such time and under such conditions as the said Court may hereafter order, pay into Court the full amount
46 due upon all such receipts, certificates or agreements hereinbefore described, as may be filed or presented in said Court under the provisions of any order hereafter entered in said cause, then this obligation to be void, else to remain in full force and virtue.

[SEAL.] DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY,
(Signed) By A. B. ELDREDGE, *President.*
(Signed) JAS. CLARKE, *Secretary.*

[SEAL.] MARYLAND CASUALTY COMPANY,
(Signed) By PETER WHITE PHELPS,
Its Attorney in Fact.

Signed, Sealed and Delivered in presence of:
(Signed) ALBERT E. MILLER,
(Signed) M. E. LEHNEN,
As to A. B. E.
(Signed) IVINS A. BROWNE,
(Signed) JOSEPH ZEPPO,
As to J. C.

(Signed) ALBERT E. MILLER,
(Signed) M. E. LEHNEN,
As to P. W. P.

Detroit, Mich., June 13, 1912.

I hereby approve the within bond as to sufficiency and amount.
(Signed) ELMER W. VOORHEIS,
Clerk U. S. District Court,
Eastern District Mich.

47 No. 293.

Power of Attorney from Maryland Casualty Company to —— ——.

Know all men by these presents: that Maryland Casualty Company, a corporation created by and existing under the Laws of the State of Maryland, of the City of Baltimore, Maryland, and duly authorized to act as sole surety in the State of Michigan, has made, con-

stituted, and appointed and by these presents doth make, constitute and appoint Peter White Phelps or Harlow A. Clark its true and lawful attorney for and on behalf of the said corporation as surety, to make, sign and acknowledge a Bond in the penalty of two hundred thousand ($200,000.00) dollars to be executed by Duluth South Shore & Atlantic Railway Company, as Principal, conditioned for payment by said Railway Company to Clerk of U. S. District Court, Eastern District of Michigan, within such time and under such conditions as the Court may hereafter order (in the case now pending in said Court of said Railway Company vs. Franz C. Kuhn, Attorney General of the State of Michigan, and others) the full amount due upon all such receipts, certificates or agreements issued by said Railway Company pursuant to the order of said Court in said cause, dated Sept. 26, 1911, as may be filed or prescribed in said Court under the provisions of any order hereafter entered therein, hereby approving, ratifying and confirming all that its said attorney may do or lawfully cause to be done in the premises by virtue of these presents.

In witness whereof Maryland Casualty Company has caused these presents to be signed by —— —— Vice President of said Company and its corporate seal to be hereunto affixed this the sixth day of June 1912.

MARYLAND CASUALTY COMPANY,
(Signed) By JAS. W. STONE, *Vice-President.*

Attest:
[SEAL.] (Signed) JAS. F. MITCHELL, *Secretary.*

O. K.
L. C. R.

Extract from the By-Laws.

Article IV, Section V. The President, or any of the Vice-Presidents, shall have power by and with the concurrence of the Secretary or any one of the Assistant Secretaries, to appoint any attorney in fact or to authorize any person or persons to execute on behalf of the Company, any bonds, recognizances, stipulations, undertakings, deeds, releases of mortgages, contracts, agreements and policies, and to affix the seal of the Company thereto.

I, James F. Mitchell, Secretary of the Maryland Casualty Company, do hereby certify that the above and foregoing is a full, true and correct copy of Article IV, Section V, of the by-laws of the Maryland Casualty Company, as the same appears on the records of the Company now in my possession and custody.

In witness whereof, I have hereunto set my hand and affixed the seal of said Company at the City of Baltimore, this sixth day of June, A. D. 1912.

(Signed) JAS. F. MITCHELL, *Secretary.*

Filed June 13th, 1912.
ELMER W. VOORHEIS, *Clerk.*

48 9.

Order Continuing Restraining Order.

The District Court of the United States for the Eastern District of Michigan, Southern Division. In Equity.

Former C. C. No. 4117.

THE DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Complainant,

vs.

GRANT FELLOWS, Attorney General of the State of Michigan, et al., Defendants.

This Court having heretofore continued the restraining order entered in said cause on July 28, 1911 until the 1st day of February, 1913:

Pursuant to the stipulation of counsel, and with the approval of the Circuit Judges who participated in the hearing of the application for interlocutory injunction;

It is now further ordered that the restraining order heretofore entered and continued here, be and the same is hereby continued in force until the hearing of said cause upon the motion for a preliminary injunction heretofore made herein, which said motion may be set down for hearing by either party to the said cause upon two weeks' notice to the opposite party, unless the said court shall sooner vacate the said restraining order.

Approved for entry.

LOYAL E. KNAPPEN,
Circuit Judge.
ARTHUR C. DENISON,
Circuit Judge.
ARTHUR J. TUTTLE,
Circuit Judge.

49 10.

Præcipe for Appearance.

United States Circuit Court, Eastern District of Michigan, Southern Division. In Equity.

No. 4117.

THE DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Complainant,

vs.

GRANT FELLOWS, CASSIUS L. GLASGOW, C. S. CUNNINGHAM, LAWTON T. HEMANS, et al., Defendants.

Now come Grant Fellows, Attorney General of the State of Michigan, and Roger I. Wykes, of Counsel, and enter appearance in the

above entitled cause for the class of passengers within the State of Michigan similar to those named in paragraph II of the Bill filed herein, the individuals of which class are unknown to complainant, and for each and every person constituting or belonging to that class, except the defendants, John R. Van Evera, Morgan W. Joplin and Fred S. Case, and claim the benefit for such class and for each member thereof, except those named, of the answer, proceedings, and testimony which have been heretofore filed, taken or introduced on behalf of the state officers who are named as defendants in said proceedings fully and to the same extent as though such class and the representatives thereof had joined in such answer and proceedings, and had participated directly in the taking of proofs and in the defense in this cause.

GRANT FELLOWS,
Attorney General.
ROGER I. WYKES,
Of Counsel.

Filed Dec. 10, 1914.
ELMER W. VOORHEIS, *Clerk.*

50 11.

Motion for Order Permitting Appearance.

United States District Court, Eastern District of Michigan, Southern Division. In Equity.

No. 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Complainant,

vs.

GRANT FELLOWS, CASSIUS L. GLASGOW, LAWTON T. HEMANS, C. S. CUNNINGHAM, et al., Defendants.

Now come Grant Fellows, Attorney General of the State of Michigan and Roger I. Wykes of Counsel, representing the unnamed and unknown persons who may become or desire to become passengers upon the complainant's railroad, and move the court for an order nunc pro tunc as of the date of the appearance of the several state officers herein, permitting the above named solicitors to appear for such class, and the individuals constituting the same (except John R. Van Evera, Morgan W. Joplin and Fred S. Case) and permitting such a class, (except the persons named) to stand upon and have full advantage of the answer, proceedings and testimony of, and taken on behalf of, the several state officers named as defendants herein, and who have appeared, answered, and participated in the defense hereof.

This motion is based upon the record and proceedings in said cause which indicate: that no appearance for such class has hereto-

fore been entered, and such class has not been defaulted nor have any individual members thereof, except John R. Van Evera, Morgan W. Joplin and Fred S. Case; that no change in the pleadings or proofs will be required or made necessary by accepting and permitting such appearances, and that the proceedings in such cause do not show that the defendants who have appeared or their silicitors have had any notice of the attempted default of the above named defendants, John R. Van Evera, Morgan W. Joplin or Fred S. Case.

On behalf of the defendants who have appeared herein, and
51 the said Attorney General, and his counsel, it is hereby stated that no notice of the default of the last named persons or of their failure to appear in said cause, was ever served upon the state officers who are defendants herein, or upon their solicitors or any of them.

GRANT FELLOWS,
Attorney General.
ROGER I. WYKES,
Of Counsel.

Filed December 10th, 1914.
ELMER W. VOORHEIS, *Clerk.*

52 12.

Stipulation Regarding Corporate and Land Grant History.

In the District Court of the United States for the Eastern District of Michigan, Southern Division. In Equity.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Complainant,

vs.

GRANT FELLOWS et al., Defendants.

Subject to the objection of the complainant that the facts are irrelevant and immaterial, it is stipulated, by and between the above named parties, by their respective solicitors, as follows:

1. The Iron Mountain Railroad Company was a steam railroad incorporated in 1855 for a term of 100 years. Capital stock authorized $400,000. Surveyed in 1852 and completed in 1857. It ran from Marquette to Lake Superior Mine (Ishpeming) and other mines.

2. The Iron Mountain Railway Co., was a strap railroad incorporated in 1855. Capital stock authorized $140,000. Opened Nov. 1, 1855. Its projected termini were from Marquette to the Mines of Jackson Iron Mountain (14 miles). It was operated for 2 years and in 1857 consolidated with the Iron Mountain Railroad. Its corporate term expired March 10, 1885. The Iron Mountain Railroad and the Iron Mountain Railway were, after consolidation in 1857, sold in 1859 to Bay de Noquet and Marquette Railroad Co., which sale was confirmed by the act of February 15, 1859.

3. The May De Noquet and Marquette Railroad Co., was incorporated in 1856 under the act of February 12, 1855. Its corportae term was for 100 years and its capital stock authorized $1,500,000.

It received a land grant from the State of Michigan under the
53 Act of Congress of June 3, 1856, and the Michigan Act of February 14, 1857, the land grant being accepted by it March 25, 1857. The construction was approved by the Governor in 1862. the acreage of the original grant was 318,123.28, and of this 128,301.05 was patented by the state to the Marquette, Houghton and Ontonagon Railroad Co., the successor of the Bay de Noquet and Marquette Railroad Co., on account of the construction of the latter, Marquette to Ishpeming. The projected termini of the Bay de Noquet & Marquette Railroad were Marquette and Little Bay de Noquet. The road was completed from Marquette to Ishpeming (20 miles) on December 1, 1862. The Bay de Noquet & Marquette was, in 1871, consolidated under the Michigan General Railroad Law with the Marquette and Ontonagon Railroad Co. retaining the name of the latter. The contract of consolidation providing that the new corporation "shall be subject to all the restrictions and liable for all the contracts and indebtedness and perform all the duties imposed by law upon either or both the said corporations."

4. The Marquette and Ontonagon Railway Co., was incorporated in 1857 for a term of 500 years. Capital stock authorized $1,000,000. The projected termini were Marquette and Ontonagon (100 miles). This road accepted a land grant from the state of Michigan under the act of Congress of June 3, 1856, and the Michigan Act of February 14, 1857. There was no construction and the land grant was forfeited by the act of the Legislature of March 17, 1863.

5. The Marquette and Ontonagon Railroad Co., was incorporated in 1863 for a term of 99 years. Capital stock authorized $2,000,000. The projected termini were Marquette and Ontonagon, via L'Anse (125 miles) 20 miles of the road was constructed by November 17, 1865, from Ishpeming to Lake Michigamme (Champion). An amendment to the articles of association was filed in 1872, making the western terminus the westerly line of Section 9, T. 47, N., 30 W. (length 42 miles). By the Legislative act of March 17, 1863, the forfeited land grant of the Marquette & Ontonagon Railway Co., was

conferred upon the Marquette & Ontonagon Railroad Co.
54 This grant was later forfeited by the joint resolution of the Michigan Legislature of March 30, 1869, and the resolution gave the Michigan Board of Control of state swamp lands the power to confer the grant upon some other company. This Board of Control conferred the grant upon the Houghton and Ontonagon Railroad Company and this action was confirmed by the joint resolution of January 24, 1871.

There was patented to the Marquette, Houghton & Ontonagon Railroad Co., 153,690.27 acres on account of the Marquette & Ontonagon Railroad construction from Ishpeming to Champion.

6. The Houghton and Ontonagon Railroad Co., was incorporated in 1870 for a term of 999 years. Original capital stock $560,000; increased in 1872 to $1,200,000. The projected termini were a

point east of Lake Michigamme and Ontonagon. In 1872 the termini were changed to Marquette and Ontonagon and were again changed to Champion and Ontonagon. No construction. This company took the Marquette & Ontonagon Railroad forfeited grant as above set forth. By virtue of a contract entered into on September 1, 1871, with Peter Mitchell, Swamp Land State Road Commissioner for the Upper Peninsula, this company became entitled to the sum of $40,000, payable in state swamp lands. Under this contract, land to the amount of 32,000 acres was granted to various persons on order of the Marquette, Houghton and Ontonagon Railroad Company, which succeeded to the rights of the Houghton and Ontonagon Railroad Co.

7. The Houghton and L'Anse Railroad Co. was incorporated in 1881 for a term of 1000 years. Capital stock authorized $1,000,000. The projected termini were Houghton and L'Anse (32 miles). This company received from the state a grant of state swamp lands under the act of May 1, 1875. The grant passed and was patented to the Marquette, Houghton & Ontonagon Railroad Co., upon the consolidation of the Houghton and L'Anse Railroad, with the Marquette, Houghton & Ontonagon Railroad.

55 8. The Marquette, Houghton and Ontonagon Railroad Co., this corporation was formed in 1872 for a term of 999 years by consolidation of the Marquette and Ontonagon Railroad with the Houghton and Ontonagon Railroad under the Michigan General Railroad Law. Original capital stock $2,040,000, increased in 1874 to $5,000,000. The projected termini were Marquette and Ontonagon. The Governor on February 6, 1873, certified that the road between the completed portions of the Marquette and Ontonagon Railroad (Champion) and L'Anse (32 miles, plus 1390 ft.) was completed before December 31, 1872. In 1883, the Marquette, Houghton & Ontonagon Railroad was consolidated with the Houghton and L'Anse Railroad under the Michigan General Railroad Law under the name of the former. The road was opened from L'Anse to Houghton in 1883 (32.14 miles). The total mileage in 1872 was 84.34 miles; in 1887 it was 135.42 miles, as shown by reports.

The land grants patented to the Marquette, Houghton and Ontonagon Railroad were the following:

(A) Federal acts:

(1) The grant to the Bay de Noquet and Marquette Railroad Co., on account of construction from Marquette to Ishpeming..	128,301.05	acres
(2) The grant to the Marquette and Ontonagon Railroad on account of construction from Ishpeming to Champion	153,690.27	"
(3) The grant to the Marquette, Houghton and Ontonagon Railroad Co., on account of construction from Champion to L'Anse..	180,389.42	"
Total lands patented by state to Marquette, Houghton and Ontonagon Railroad on account of Federal Acts.....	462,380.74	"
Less amount necessarily included in the deed of release to the State, executed on April 8, 1874..	28,150.10	"
Net total lands received by Marquette, Houghton and Ontonagon Railroad Company, on account of Federal Acts..	434,230.64	"

56 (B) Under State swamp land contracts:

(1) On account of the grant to the Houghton and L'Anse Railroad Co., for the construction from L'Anse to Houghton.....	82,421.62	acres
(2) On account of grant to Houghton and Ontonagon Railroad Co., for construction from L'Anse to Nestoria, (patented to various people on order of Marquette, Houghton and Ontonagon Railroad Co.)	32,000.00	"
Total acres swamp land used or received by Marquette, Houghton and Ontonagon Railroad Co.	114,421.62	"

Of the public lands patented to the Marquette, Houghton and Ontonagon Railroad Co., there passed to the Duluth, South Shore & Atlantic Railway Company 82,385.29 acres (being the lands conveyed by that company to the South Shore Land Company, Limited). All the other granted lands of the Marquette, Houghton and Ontonagon Railroad Co. having been disposed of by the last named Company; of which lands so previously disposed of, about 386,000 acres were sold for a consideration of $2,400,000 during the year 1881.

9. The Marquette and Western Railroad Co. was incorporated in 1883, to compete with the Marquette, Houghton and Ontonagon Railroad. Capital stock authorized $1,250,000. Its termini were Marquette and Ishpeming (17.03 miles). Was purchased in 1885,

by the Marquette, Houghton and Ontonagon Railroad for the sum of $2,011,346.93, stocks and bonds being given in payment.

10. The Detroit, Mackinac and Marquette Railroad Co. was incorporated in 1879 for a term of 1000 years. Original capital stock authorized $1,200,000; amount paid in, in 1880, $5,360. The capital stock was increased in 1881, in 1882 and 1883 to a total of $10,000,000. The projected termini were Mackinac to Marquette (152 miles). The road was reported complete on December 15, 1881. This company received a state swamp land grant by the provision of Chapter 36 of the Public Acts of 1873, and subsequent acts extending the time for construction. The grant as made was 1,326,688.35 acres and the lands were patented in March and April 1882.

The Detroit, Mackinac and Marquette Railroad was sold under foreclosure on October 20, 1886, and was purchased for $1,010,000 by Hugh McMillan, whose deed was filed December 20, 1886. The patented lands of this company were separately mortgaged and passed to the mortgagees or their grantees. None of this land came into possession of the Duluth, South Shore & Atlantic Railway Company.

57

11. The Sault Ste. Marie & Marquette Railroad Co. was incorporated in 1880 for a term of 99 years. Capital stock authorized $300,000. Its projected termini were from a point on the Detroit, Mackinac and Marquette Railroad to Sault Ste. Marie (35 miles) all in Chippewa County. There was no construction.

12. Mackinac and Marquette Railroad Co. was incorporated in 1886 for a term of 999 years. Capital stock authorized $3,040,000. This company was organized by the *purchaser* at the foreclosure sale of the Detroit, Mackinac & Marquette Railroad pursuant to the provisions of Section 6224 of the Compiled Laws of 1897.

13. Duluth, Superior and Michigan Railway Co., was a Wisconsin corporation, incorporated in 1886. Capital stock authorized $6,500,000. Its projected termini were from West Superior to Montreal River, Township 47, Range 1 East. No construction.

14. The Wisconsin Sault Ste. Marie & Mackinac Railway Co. was incorporated in 1886 for a term of 99 years. Capital stock authorized $2,600,000. The proposed termini were the Montreal River, the dividing line between Michigan and Wisconsin, and Marquette, Michigan. No construction.

15. Duluth, South Shore & Atlantic Railway Co., was incorporated in 1887 under the Michigan General Railroad Law by the consolidation of the railroad companies described above in paragraphs 11, 12, 13 and 14 for a term of 99 years. Its capital stock is $22,000,000; $10,000,000 of preferred stock and $12,000,000 of common stock. By the law authorizing the consolidation the new company was required to become and "be subject to all the obligations and liabilities heretofore resting upon said several corporations so consolidated."

58

The Marquette, Houghton and Ontonagon Railroad was leased to the Duluth, South Shore & Atlantic Railway Co., in 1887, on the latter guaranteeing 6% on $3,278,456, now preferred stock and surplus net earnings to holders of common stock. This lease

was repudiated by the Duluth, South Shore & Atlantic Railway Co., stockholders and cancelled by both companies. On July 17, 1890, the Duluth, South Shore & Atlantic Railway Co., purchased all the property of the Marquette, Houghton and Ontonagon Railroad Co., except its franchise to be a corporation; the latter company having previously disposed of the larger portion of its lands, as hereinbefore set forth in paragraph 8 hereof; the Duluth, South Shore & Atlantic Railway Co., acquired and holds the entire capital stock of the Marquette, Houghton and Ontonagon Railroad Co., with the exception of a few hundred shares of stock which are still outstanding in the hands of the public.

16. The Dead River Railroad was constructed in 1889 and ran from a point on the Duluth, South Shore & Atlantic Railway near the west limits of the city of Marquette, about 3 miles northeasterly to reach the mill and yards of the Dead River Lumber Company. All the property of this company was purchased by the Duluth, South Shore & Atlantic Railway Co. in July 1907.

The following corporations are connected with the Duluth, South Shore & Atlantic Railway Co., through stock ownership or otherwise.

17. The South Shore Land Company Limited was organized in 1898 under the Michigan partnership association statute for the purpose of taking over and managing the lands received from the Marquette, Houghton and Ontonagon Railroad Co. Capital stock $3,000, all of which is owned by the Duluth, South Shore & Atlantic Railway Co. To this company was conveyed 82,385.29 acres of swamp land granted on account of the Marquette, Houghton and Ontonagon Railroad construction from Houghton to L'Anse.
59 Up to the time of the commencement of this suit 10,991.82 acres of said land had been sold by said company and it then held about 71,393.47 acres unsold.

18. The Mineral Range Railroad Co., was incorporated in 1871, under the name of the Mineral Range and L'Anso Bay Railroad Co. Its capital stock was $200,000 and on November 8, 1872, its stock was increased to $400,000 and its name changed to the Mineral Range Railroad Company. The stock was increased in 1901, 1903 and 1910 until it is now authorized at $1,500,000. Its projected termini were from Keweenaw Bay, via Houghton, to Calumet (45 miles). The proposed length was increased to 100 miles on November 18, 1872. The total mileage is 73.21. This company is controlled by the Duluth, South Shore & Atlantic Railway Co., through the ownership by the Duluth, South Shore & Atlantic Railway Co. of 53% of the capital stock of the Mineral Range Railroad Co.

19. The Hancock and Calumet Railroad Co. was incorporated in 1885, for a term of 50 years. Its projected length was 18 miles, from Portage Lake, via Lake Linden, to Red Jacket. In 1886, its length was increased 4 miles and capital stock increased to $350,000, and in 1899, the proposed length was increased to 50 miles. The total mileage is 33.14 miles. This road is controlled by the Mineral Range Railroad Co., by its ownership of the entire capital stock of the former. The road is leased by the Mineral Range Railroad Co.,

for the corporate existence of the Hancock and Calumet Railroad Co.

20. The Mohawk Mining Company Railroad. This railroad has a mileage of 16.7 miles and is owned by the Mohawk Mining Company. It is operated and maintained by the Mineral Range Railroad Company by a contract which expires on Decem' er 15, 1917, and calls for an annual rental, paid by the Mineral Range Railroad Co., to the Mohawk Mining Company of $2,700.

21. Canadian Pacific Railway Company. This company in July 1888 purchased majority holdings of the common and pre-
60 ferred stock of the Duluth, South Shore & Atlantic Railway Co. At present the Canadian Pacific Railway Co. holds $6,100,000 in common stock; $5,100,000 in preferred stock, the entire issue of the first consolidated mortgage bonds and the entire issue of the income bonds of the Duluth, South Shore & Atlantic Railway Co.

All of the incorporations above referred to, with the exception of that of the Canadian Pacific Railway Co., were under the general laws of the state of Michigan.

Dated this 7th day of December, 1914.

A. B. ELDREDGE,
Solicitor for Complainant.
ROGER I. WYKES,
Of Counsel for Defendants.

Filed December 10, 1914.
ELMER W. VOORHEIS, *Clerk.*

61 13.

(Indorsement:) United States District Court, Eastern District of Michigan, Southern Division. Duluth, South Shore & Atlantic R. R. Co., vs. Grant Fellows, Attorney General, et al. Memorandum Order in re deposit in Clerk's Office of Bank receipts of 1/3 of Plaintiff's gross earnings. Filed Oct. 25, 1915, at — o'clock — M. (Signed) Elmer W. Voorheis, Clerk. (Not to be entered. E. W. V.)

62 United States District Court, Eastern District of Michigan, Southern Division. In Equity.

At Chambers in the City of Grand Rapids, on the 22nd day of Octo'er, 1915, there being present: Circuit Judges Loyal E. Knappen and Arthur C. Denison, and District Judge Clarence W. Sessions.

Former C. C. No. 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Complainant,

v.

GRANT FELLOWS, CASSIUS L. GLASGOW, LAWTON T. HEMANS, C. S. CUNNINGHAM, et al., Defendants.

In the above entitled cause it having been made to appear to the Court that the bond for $200,000, filed by the complainant pursuant to the order of this Court, is no longer sufficient in amount to secure the liability of the complainant in this suit if a decree adverse to it shall be rendered.

It appearing, further, that on September 30, 1915, the total amount of the receipts, certificates or agreements issued by the complainant pursuant to the order of the Court entered herein on September 26, 1911 (which receipts, certificates or agreements are hereinafter called "refund checks"), was approximately $502,192.00, and not in excess of that amount.

It appearing, further, that the complainant had, on September 30, 1915, created a fund amounting to $188,546.63, which it has set aside for the purpose of redeeming said refund checks in case it shall be compelled to make such redemption, which fund is deposited as follows:

63

In the Marquette County Savings Bank, Marquette, Mich.	$103,091.16
In the Negaunee National Bank, Negaunee, Mich.	36,649.28
In the Negaunee National Bank, Negaunee, Mich.	36,649.28

It appearing, further, that the said complainant is willing to submit said fund to the order of the Court, to be used for the redemption of said refund checks in case the complainant shall become liable to make such redemption; and,

It further appearing that said complainant is willing hereafter to deposit in such redemption fund one-third of its gross revenues received during each month hereafter for the transportation of passengers within the State of Michigan, until such time as the amount of the fund, including the amount of the bond heretofore given, shall equal the gross liability of the complainant for refund checks theretofore issued, and is willing thereafter to deposit monthly the amount of its current liability by reason of the issuing of refund checks.

Now, therefore, it is ordered, That

If and when, within twenty days from the date of this order, the complainant shall subject the fund already accumulated to the order of this Court, to secure the payment of such refund checks as the

complainant shall be adjudged liable to pay, by filing with the Clerk of this Court a receipt from each bank hereinbefore named, acknowledging that it holds, and will hold, that portion of said fund already on deposit with it, and all additions thereto, including interest accruing thereon, subject to the order of this Court in this case;

And if the complainant shall make further deposits monthly equaling one-third of its gross revenues received for the transportatoin of passengers in Michigan, as such earnings are determined in the usual course of its business, until the total on deposit
64 to secure the redemption of refund checks shall equal the gross accrued possible liability of the complainant on that account, less $200,000.00, and thereafter shall deposit each month an amount equal to its accruing liability by reason of the issuing of refund checks in that month, less any interest accrued and payable on deposits previously made;

And if the complainant shall hereafter make monthly reports to the Clerk of this Court on or before the 27th day of each month, certifying that it has complied with this order, and showing the amounts deposited in pursuance hereof during the preceding calendar month, and the several depositories thereof, which depositories shall be the banks hereinbefore named, or such other bank or banks selected by complainant as shall have agreed, in the manner and form hereinbefore described, to hold the sums deposited with it or them subject to the order of this Court; then the restraining order heretofore issued in this case shall be and continue in force until the further order of the Court.

Such funds when so deposited, including all additions thereto, shall be held, pursuant to this order, and be subject to be withdrawn only upon the proper order of this Court, and shall be charged with a trust in favor of such holders of refund checks, as shall, upon the termination of this litigation, be determined by the court to be entitled to participation therein.

It is further made a condition of this order that complainant shall make such further or other reports showing its proceedings under this order as may be required by the Court, or by the Clerk thereof, and that it shall serve on the solicitor for the defendants copies of all statements or reports that it shall make to the Court or its Clerk.

(Signed) L. E. KNAPPEN,
(Signed) A. C. DENISON,
Circuit Judges.
(Signed) C. W. SESSIONS,
District Judge.

65 The undersigned Bank hereby acknowledges that there has been deposited with it by The Duluth, South Shore & Atlantic Railway Company a special fund known as the "Michigan Rate Case Fund," amounting at this date to the sum of $———; that it will hold such deposit, and all additions thereto, together with all interest accruing, in strict accordance with the terms of an order of the United States District Court for the Eastern District of Michi-

gan, Southern Division, in Equity, of which the foregoing is a copy; that it will pay the same out only when and as authorized by proper order of the said Court; and that it will make reports of the amounts on deposit in such fund whenever required to do so by said Court or the Clerk thereof.

Dated —— —, ——.

—— ——.

Filed Octo'er 25, 1915.
ELMER W. VOORHEIS, *Clerk.*

66 14.

Order Regarding Fund to Secure Payment of Refund Coupons.

United States District Court, Eastern District of Michigan, Southern Division. In Equity.

At Chambers in the City of Grand Rapids on the 22nd day of October 1915, there being present: Circuit Judges Loyal P. Knappen and Arthur C. Denison, and District Judge Clarence W. Sessions.

Former C. C. No. 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Complainant,

v.

GRANT FELLOWS, CASSIUS S. GLASGOW, LAWTON T. HEMANS, C. S. CUNNINGHAM, et al., Defendants.

In the above entitled cause it having been made to appear to the Court that the bond for $200,000 filed by the complainant pursuant to the order of this Court, is no longer sufficient in amount to secure the liability of the complainant in this suit if a decree adverse to it shall be rendered.

It appearing, further, that on September 30, 1915, the total amount of the receipts, certificates or agreements issued by the complainant pursuant to the order of the Court entered herein on September 26, 1911 (which receipts certificates or agreements are hereinafter called "refund checks") was approximately $503,192.00, and not in excess of that amount.

It appearing, further, that the complainant had, on September 30, 1915, created a fund amounting to $188,546.63, which it has set aside for the purpose of redeeming said refund checks in case it shall be compelled to make such redemption, which fund is deposited as follows:

In the Marquette County Savings Bank, Marquette, Mich	$103,091.16
In the Negaunee National Bank, Negaunee, Mich	36,649.28
In the First National Bank, Duluth, Minn.	48,803.19

It appearing further that the said complainant is willing to submit said fund to the order of the Court, to be used for the redemption of said refund checks in case the complainant shall become liable to make such redemption; and,

67 It further appearing that said complainant is willing hereafter to deposit in such redemption fund one-third of its gross revenues received during such month hereafter for the transportation of passengers within the State of Michigan, until such time as the amount of the fund, including the amount of the bond heretofore given, shall equal the gross liability of the complainant for refund checks theretofore issued, and is heretofore to deposit monthly the amount of its current liability by reason of the issuing of refund checks.

Now, therefore, it is ordered, That

If and when, within twenty days from the date of this order, the complainant shall subject the fund already accumulated to the order of this Court, to secure the payment of such refund checks as the complainant shall be adjudged liable to pay, by filing with the Clerk of this Court a receipt from each bank hereinbefore named, acknowledging that it holds, and will hold, that portion of said fund already on deposit with it, and all additions thereto, including interest accruing thereon, subject to the order of this Court in this case;

And if the complainant shall make further deposits monthly equaling one-third of its gross revenues received for the transportation of passengers in Michigan, as such earnings are determined in the usual course of its business, until the total on deposit to secure the redemption of refund checks shall equal the gross accrued possible liability of the complainant on that account, less $200,000.00, and thereafter shall deposit each month an amount equal to its accruing liability by reason of the issuing of refund checks in that month, less any interest accrued and payable on deposits previously made;

And if the complainant shall hereafter make monthly reports to the Clerk of this Court on or before the 27th day of each month, certifying that it has complied with this order, and showing the amounts deposited in pursuance hereof during the preceeding calendar

68 month, and the depositories thereof, which depositories shall be the banks hereinbefore named, or such other bank or banks selected by complainant as shall have agreed, in the manner and form hereinbefore described, to hold the sums deposited with it or them subject to the order of this Court; then the restraining order heretofore issued in this case shall be and continue in force until the further order of the Court.

Such funds when so deposited, including all additions thereto, shall be held, pursuant to this order, and be subject to be withdrawn only upon the proper order of this Court, and shall be charged with a trust in favor of such holders of refund checks, as shall, upon the termination of this litigation, be determined by the court to be entitled to participate therein.

It is further made a condition of this order that complainant shall make such further or other reports showing its proceedings under this order as may be required by the Court, or by the Clerk thereof,

and that it shall serve on the solicitor for the defendants copies of all statements or reports that it shall make to the Court or its Clerk.

L. E. KNAPPEN,
A. C. DENISON,
Circuit Judges.
C. W. SESSIONS,
District Judge.

69 The undersigned Bank hereby acknowledges that there has been deposited with it by The Duluth, South Shore and Atlantic Railway Company a special fund known as the "Michigan Rate Case Fund," amounting at this date to the sum of $43,217.75, that it will hold such deposit and all additions thereto, together with all interest accruing, in strict accordance with the terms of and order of the United States District Court for the Eastern District of Michigan, Southern Division, In Equity, of which the foregoing is a copy; that it will pay the sum out only when and as authorized by proper order of the said Court; and that it will make reports of the amounts on deposit in such fund whenever required to do so by said Court or the Clerk thereof.

Date- Negaunee, Michigan Oct. 26, 1915.

NEGAUNEE NATIONAL BANK.
W. C. WAGNER, *Cas.*

Filed October 29, 1915.
ELMER W. VOORHEIS, *Clerk.*

70 15.

Stipulation as to Certain Exhibits.

In the District Court of the United States, Eastern District of Michigan, Southern Division. In Equity.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Complainant.

vs.

GRANT FELLOWS, CASSIUS L. GLASGOW, LAWTON T. HEMANS, C. S. CUNNINGHAM et al., Defendants.

It is hereby stipulated between the parties that, inasmuch as the originals can not be found, duplicates of the following exhibits may be marked by the Master and returned to the Court:

Complainant's:

No. 1*c*, Riggs' Allocation of Lands, 1913, as amended.
No. 49, Riggs' Apportionment of Values by Departments.
No. 50, Riggs' Modification of Exhibit No. 1, Appraisal 1911.
No. 94, I. C. C. Classification for Operating Expenses.

Defendants':

No. 43, and 43*a* to 43*h* inclusive, Printed Reports of South Shore for the years 1905 to 1913 inclusive.
No. 44, D. S. S. & A. Switching Tariff.
No. 45, C. P. R. Freight Division Sheet.
No. 83, Three Blueprints showing D. S. S. & A. rail sections, and showing wear on upper and lower sides on curves.

71 It is further stipulated and agreed, that the following exhibits need not be returned to the Court, but that the Court may call for, and that either party may produce or use, or refer to, any or all of them if and as desired, but that if either party shall produce or use, or refer to, any of said exhibits, said party shall produce the whole thereof for use by the other party if desired.

Complainant's:

No. 11, Riggs' Memorandum of Cooley Appraisal of 1900.
No. 90, Horton, Tax Commission Field Notes, Harlow Additions 1, 2 and 3, Marquette.
No. 91, Horton, Tax Commission Field Notes, Harlow Addition 5, Marquette.
No. 92, Horton, Tax Commission Field Notes, Nester Addition 1, Marquette.

Defendants':

No. 1, Report to State Board of Assessors, 1910.
No. 2, Vitali's Map of Ontonagon Valley.
No. 3, Robertson, Report of Council Committee, Marquette.
No. 9, Delf's Ore Tariffs, 1909–1913.
No. 23, Volume 5 of 1900 State Appraisals, pp. 64 to 99.
No. 41, Adam's large Land Grant Map.
No. 63, Printed Report of Mackinaw & Marquette R. R. Co., in Railroad Com. Report for 1887, pp. 77 to 88.
No. 66, Proceedings of 3rd Annual Convention of Railroad Commissioners, 1891.
No. 67, Proceedings of 4th Annual Convention of Railroad Commissioners, 1892.
No. 68, Proceedings of 5th Annual Convention of Railroad Commissioners, 1893.
No. 69, 28th Report of Association of American Railway Accounting Officers, 1913.

72 The following are exhibits of which the Record contains either a full copy, or a sufficiently full copy of the parts pertaining to this controversy, so that the originals need not be returned by the Master:

Complainant's:

No. 45*a*, sheet 2, Hire of Equipment, etc., 1910 (R. 3251).
No. 47*a*, sheet 2, Hire of Equipment, etc., 1911 (R. 3251).
No. 48*a*, sheet 2, Hire of Equipment, etc., 1912 (R. 3251).
No. 51, Diagram for earthwork estimates, Loweth (R. 2731).
No. 52, Estimated Loss (R. 3232).
No. 53, Population and Railroad Mileage (R. 3264).
No. 54, Statement of Operations, 1887–1913 inclusive (R. 3298).
No. 55, Statistics of other Michigan Railroads (R. 3312).

Defendants':

No. 3, Robertson, Report of Council Committee, Marquette (R. 2401–2405).
No. 13, Delf's Compilation of Freight-train Speed (R. 4238–4242).
No. 24, Summary Sheet of 1902 Appraisal (R. 5111).
No. 25, Summary Sheet of 1905 Appraisal (R. 5117).
No. 28, Letter on Land Values, from A. E. Miller (R. 5226–5228).
No. 46, Delf, Additions and Betterments, 1900 to 1913 (R. 7925–7933).

There are two of Complainant's exhibits numbered "90," one being a copy of a letter from Mr. Eldredge to the Interstate Commerce Commission, and the other being Tax Commission Field Notes, above referred to. The former is returned to the Court, the latter is not.

73–325 Defendants' Exhibits Nos. 66 to 70 inclusive were erroneously marked with the numbers 94 to 98 inclusive.

Dated October 24, 1916.

A. B. ELDREDGE,
Of Counsel for Complainant.
ROGER I. WYKES,
Of Counsel for Defendants.

Filed February 1, 1917.
ELMER W. VOORHEIS, *Clerk.*

(Here follows report of Herbert L. Baker, Special Master, filed Feb. 1, 1917, printed as a separate volume.)

326 17.

United States District Court, Eastern District of Michigan, Southern Division. In Equity.

No. 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Complainant,

vs.

GRANT FELLOWS, CASSIUS L. GLASGOW, LAWTON T. HEMANS, C. S. CUNNINGHAM, et al., Defendants.

Defendants' Exceptions to the Report of the Special Master.

Now come the above named defendants, and severally and collectively take the following exceptions to the Report of the Special Master, dated January 28, 1917, filed February 1st, 1917.

Exception No. 1.

General Overruling Objections to Tentative Report.

That they except to the action, conclusions, determinations and findings of the Master in overruling and refusing in whole or in part to make the corrections and alterations in his tentative report indicated by the several objections presented on the part of the defendants to such report as submitted to counsel for the respective parties of which the final report is largely a copy, such objections being set forth in the final report of the Master on pages 417–469 inclusive, and the specific objections overruled by the Master appearing upon the face of the report and being enumerated as follows, to-wit:

327 Objections numbered 1–24, both inclusive, and 26–29, both inclusive.

That the objections to said report so set forth are hereby intended to be renewed as exceptions, and that wherever the right is therein reserved to present a specific exception to the court, such exception is herein, whether repeated or not, intended to be presented to the court as an exception to such report.

Exception No. 2.

Estoppel—Land Grant Condition.

They except to that finding and conclusion of the Master discussed and determined on pages 18-30 of such report, that as a matter of law complainant is not bound or estopped by the condi-

tions attached by law to the receipt and acceptance of land grant lands through the acceptance of land grant lands by itself or its predecessors in ownership, from questioning the validity of the Michigan passenger rate statute as found in Act 276 of the Public Acts of 1911 fixing the rates of fare to be charged upon the complainant's railroad in Michigan of two cents per mile for the carriage of passengers.

Exception No. 3.

Decree, Objection to, and Form and Findings of.

That they except to the findings and conclusions of the Master as expressed and set forth in the proposed form of decree set forth in said report on pages 407 to 409 thereof, and to the conclusion and determination therein that the rates of fare fixed by Act 276 of the Public Acts of Michigan of 1911 are, or will if enforced be, confiscatory of the property of complainant or will operate to deprive it of its property without due proces of law, and that said Act is in violation of the Constitution of the United States as applied to complainant and to the conclusion, finding and determination as expressed in said form of decree that the defendants and their successors, or any of them, should be restrained and enjoined from attempting to compel the complainant to put into force the rates in said statute fixed or from taking action or proceedings against complainant or its representatives to enforce the penalties
328 prescribed by law for a violation of the terms of said act, and to the finding and determination as expressed in said form of decree, that the defendants therein named as selected individuals representing the traveling public, be restrained from instituting proceedings against the said complainant.

Exception No. 4.

General, to Determination of Confiscation.

That they except to the entire of such report in that the said Master erred in his conclusions, determinations and findings in substance and effect that the statutory rate of fare prescribed by Act 276 of the Public Acts of Michigan of 1911 is confiscatory or insufficient or inadequate or that the enforcement of such statute will invade the constitutional rights of the complainant or will operate if enforced to deprive it of its property without due process of law, and that by reason thereof the enforcement of the rates there fixed or the operation of the statute as applied to the complainant in the operation of its intrastate passenger business ought to be restrained.

Exception No. 5.

Burden of Proof.

They object to the said report and to the conclusions and determinations and findings thereof as expressed in pages 31 to 61 thereof in overruling the contention of the defendants that as a matter of law the burden of making full and positive proof in order to overcome the validity of a rate fixing statute is upon the complainant and that it is essential that the complainant prove beyond controversy and beyond the possibility of a reasonable doubt every fact, element or thing upon which a decision of invalidity or confiscation or of insufficiency of net earnings in the regulated service is predicated.

They further except that in a number of instances throughout the report the reasonable doubt has been resolved in favor of the complainant and against the validity of the statute and the
329 rate. A few of the particulars which are pointed out as illustrative are the following:

(*a*) In making charges or in allowance for additions to property schedules for the items of contingencies at $400,000, taxes at $100,000, appreciation and solidification at $300,000 and working capital, stores and supplies at $339,918.

(*b*) In refusing to depreciate the items of ballast and track laying and surfacing in the face of testimony to the effect that those items of property do in fact depreciate and now exist and did in 1910-1913, inclusive, exist, upon complainant's railroad in a depreciated condition.

(*c*) In the acceptance of the complainant's alterations of the defendants' modified revenue train mile ratio for the division of the common property and common expenses of the complainant between passenger and freight service.

(*d*) In the determination that the decreased rates of fare now provided for by statute will not, if put into effect and that the decreased rates of 1907 did not subsequent thereto, produce increases in traffic or did not produce increases of traffic sufficient to offset in whole or in large part the decrease in revenue per passenger mile caused thereby.

(*e*) In refusing to eliminate from the operations of the complainant necessary to furnish the service required at two cents per mile the other more expensive and less profitable operations of the complainant in the carrying on of its outside operations including sleeper and diner service.

As incidental to this exception they also except to the refusal of the Master to find or to hold in substance or effect, that the character, extent or effect of the presumption of validity does not depend upon proof or inference of the legislative knowledge or upon its want of knowledge or upon its means of knowledge, or the extent of its investigations, and they insist that it is a positive presumption that the

law is valid unless all conditions which would render it invalid appear absolutely and they except to his holding, finding and setting forth of the contrary doctrine.

Exception No. 6.

Rule of Reasonable Doubt.

That they except to so much of said report as discusses, applies, adjudicates or determines the rule of "reasonable doubt" or the presumptions applicable in rate cases or the burden of proof or degree of proof required, as found on pages 31 to 61 of the report in its entirety without setting out specific language used for the
330 reason that a great multitude of separate paragraphs, sentences and clauses thereof are objectionable, and the objectionable matter is so interwoven with that which is proper as to render it inexpedient and confusing to attempt to separate and base separate exceptions upon each objectionable clause or series of clauses and as to render the entire discussion and conclusions upon the subject improper.

Exception No. 7.

Sufficiency and Character of Proof.

That the said report and its several findings are excepted to as erroneous and improper in that upon the showing made by the complainant the Master should have determined that the proofs, testimony and exhibits were insufficient to sustain or to permit a determination of confiscation in that the proofs are indefinite, that the divisions of expenses between passenger and freight services were dependent upon arbitrary assumptions and upon general opinions not represented by or shown in accounts kept for the purpose of showing the amount of expenditures incurred for the various services and were not based upon actual experience or shown to be derived from the keeping of suitable accounts, at least during typical periods which would furnish statistical information bearing upon the separation of costs to the several services. That the proof of matters of such intricacy should not be permitted to rest upon general expressions of judgment, and that the proofs do not fulfill the burden incumbent upon complainant to establish the claimed invalidating facts by definite and convincing proofs, but represent an attempt on the part of complainant after having assailed the constitutionality of the State act, to rest upon expressions of judgment when it had in its power to present accurate data which would permit the court to draw the right conclusions?

Exception No. 8.

Determination of Legal Principles.

They except to the report of the Master and to his conclu-
331 sions and determinations in deciding in favor of the complainant and against the contentions of defendants upon each of the eight distinct points of defense listed and set forth in said report, on pages 400-401 thereof, in the language following:

"This method of division proposed by defendants would, if adopted, defeat the complainants' case, and it is one of a number of distinct points of defense, any one of which if sustainable would also defeat the complainants' case. Those points of defense are eight in number and are as follows, viz.:

1. That the complainants are estopped from contesting the validity of the statute by the acceptance of land grants.

2. That the value on which complainants are entitled to a return is commercial value and that the same has not been proven.

3. That the common property and expenses must be divided between passenger and freight on the basis of time of occupancy as proposed by defendant.

4. That the sleeping and dining car service must be treated as outside operations and not a part of the service to which the prescribed rate applies.

5. That the complainants must prove every material fact beyond the possibility of a doubt.

6. That the presumption in favor of the statute although disputable in theory is indisputable in fact.

7. That the complainants must prove by affirmative evidence that the loss from decreased rates will not be overcome by increased traffic.

8. That complainants must prove what percent of return they are entitled to; that they have failed to make such proof, and are therefore not entitled to the relief prayed for.

If any one of these points of defense is sustainable the complainants' case must fail."

Exception No. 9.

Rate of Return.

They except to such report in its entirety and to the several determinations and findings thereof which resulted in the conclusion that the rate of return to complainant to be expected upon the value of the property employed by it in its Michigan intrastate passenger business under the rates prescribed in said Act 276 of the Public Acts of 1911, is or would be but 2.24%, and that such rate of return upon such property amounts to a deprivation of complainant's property rights in violation of the Fourteenth Amendment of the Federal Constitution, and they except to all findings and determinations upon which is based any conclusion that a less rate of return than 8% on

such property is shown with such statute in operation, and they specifically except to the conclusion, and to the several findings upon which it is based, stated on page 391 of such report as follows:

332 "I have found (1) the entire value of complainant's property to be $13,901,938; (2) the value of the property employed in the complainant's Michigan intrastate passenger service to be $2,741,872; (3) the rate of return to be expected thereon under the prescribed rate to be 2.24 per cent, and (4) the rate of return to which the complainants are entitled under the constitution to be 6.5 per cent."

Exception No. 10.

Rate of Return.

They except to the conclusions, determinations and findings of the Master upon the subject of the rate of return to which complainant is entitled on its whole property in Michigan engaged in serving the public as well as upon that part of its property engaged in performing its intrastate passenger operations in Michigan, as embraced in pages 377 to 390 of the report, and also except specifically to the finding, on page 389 thereof and repeated on page 391, that the minimum rate of return to which complainant is entitled under the constitutional guaranty of the Fourteenth Amendment is 6.5 per cent, and specifically except to the several incidental or corollary conclusions and findings upon which the same is based as follows:

(*a*) That the complainant is entitled to a greater return than the current rate of interest at 5% upon money loaned without specific contract arrangements.

(*b*) That there is any testimony or evidence in the case or that the Master may take judicial notice of practices and customs or the experience of the community, of such a character or in such a manner as to predicate thereon a determination that complainant is entitled to a fixed or minimum rate of return of 6.5% or that a rate of return of more than the current rate of interest is expected by investors generally, on investments of similar hazard in the community in which complainant's railway lies.

(*c*) That, as stated on page 386 of the report, the rate of interest provided by statute where no rate is stipulated has no relation whatever to the question of what would be a proper rate of return from a given property investment or from the investment in complainant's property on the case presented to the Master on the record in this cause.

333 (*d*) That the complainant is entitled to a greater rate of return than is paid as interest on its bonded indebtedness, which is greater than the value of its property.

(*e*) That capital could not be induced to reproduce and operate this property by a prospective return of less than 8 per cent.

(*f*) That he resolves doubts in favor of defendants in finding the minimum rate of return to which complainant is entitled by taking a

point half way between the interest rate on money without contract and such 8 per cent.

(*g*) That where the statutory regulation is of a part of the business only, the complainant is entitled to a full return upon the property engaged in the regulated part of the business as against a claim of confiscation and to the same rate of return to which it would be entitled, if its whole rate schedule on all branches of its business were in litigation.

Exception No. 11.

Rate of Return.

That they except to so much of said report, found on pages 394 et seq., as discusses the relative rates of return from passenger and freight services and to the determinations and findings based thereon, and particularly to such part thereof as bears upon or supports the inference that a passenger rate, sufficient in itself to support the property engaged in carrying under it, can be affected or made insufficient by being combined with freight rates which are insufficient, and they insist that it is incumbent upon a complainant before it can be entitled to relief on the ground of confiscation, to show confiscation in fact through the denial of sufficient earnings from the regulated service at the rates being questioned, to support the fair proportion of the property actually devoted to that service.

Exception No. 12.

Values in General.

They except to the discussions and determinations in such report, upon page- 65 to 87 thereof, upon the questions of "value" and "value proper for use in rate cases" for the reason that the
334 same is predicated upon erroneous premises, is supported by untenable arguments, is based upon faulty reasoning and does not properly lay down the rules applicable in rate cases. This exception is made to the entire discussion, for the reason that to except to each erroneous passage thereof would make these exceptions unduly prolix and confusing.

Exception No. 13.

Values, Cost of Reproduction.

They except to said report as being erroneous in its several findings and conclusions and particularly as discussed and set forth on pages 62 to 87 thereof, that as a matter of law the "cost of reproduction value," less depreciation, or "the replacement cost value" is to be taken as the absolute measure of the value which must be sustained by the rates permitted by law to be charged, and except to the findings that inasmuch as the rates fixed do not pay what the Master finds to

be a fair rate of return upon the value thus arrived at, the rate fixed is unremunerative or confiscatory.

Exception No. 14.

Values, Commercial, as Limiting.

They except to such report and to its findings and conclusion as matters of law and fact as expressed between pages 62 to 87 thereof, that the cost of reproduction value of the property upon which complainant is entitled to a return can, or does exceed its commercial value or can or does exceed the consideration at which the public could acquire the full title to such property through exercise of its power of eminent domain.

Exception No. 15.

Values, Intrastate Passenger, Too High.

They except to the finding and conclusion, as expressed on page 391 of such report and at other places and exhibits therein, that the value of the entire of complainant's property devoted to its intrastate
335 passenger business in Michigan is as much as $2,741,872, or that it is greater than the $1,547,888 shown by defendants' claimed value, or that the value of complainant's property devoted to its entire freight business, or to its interstate or intrastate freight business, or to its interstate passenger business, is so small in proportion to the amount devoted to its intrastate passenger business, as he finds it to be; otherwise stated, the exception is that too large a proportion of property is found to be devoted to intrastate passenger business and too small a proportion to other classes of business.

Exception No. 16.

Values—Specific Criticisms.

They except to such report, and its several findings and conclusions appearing on pages 62 to 242 thereof, in that the value of complainant's property engaged in and devoted to, its business in serving the public in Michigan as adopted by the Master at $13,901,938, is excessive, is greater than its actual value and is greater than the cost to replace or reproduce the same, less depreciation, and is greater than the, or any, value thereof, that complainant is entitled to support by Michigan statutory rates of charge, and is greater than the, or any, value thereof, that the public is required to support; that such excessive, erroneous and inflated value is due to the considerations mentioned in the other exceptions herewith made, and to the following:

(*a*) In arriving at, and in fixing the values fixed and listed for the various descriptions of real estate and right of way, the Master includes improper values, and improper elements of value and proceeds upon erroneous theories of value, in that, to-wit:

(1) On pages 88 to 90 and 114 of the report, strategic or special values are improperly attributed to and included for, certain lands on account of their claimed adaptation for railroad purposes.

(2) On pages 91 to 95 and 115 of the report riparian and other water rights not in actual railroad use, are improperly allowed
336 as being appurtenant to lands of complainant at St. Ignace, Marquette and Houghton.

(3) On pages 95 to 99 of the report, certain trackage rights existing in streets in the cities of Marquette and Ishpeming *and* erroneously included.

(4) On pages 99 to 107 and 115 of the report, mineral and ore values in and under the right of way, and speculative values due to the possibility of discovery of minerals under the right of way are improperly allowed.

(5) On pages 107 to 118 and 115 of the report, land values generally are taken, and are in the findings used, which are excessive and contrary to the weight of evidence.

(6) Pages 107 to 118 of the report show improper reliance upon testimony of witnesses placing high values, and a refusal to take the testimony of witnesses equally entitled to credit and equally well qualified to fix values, whose values were well considered, and who fixed lower values and the refusal to apply proves tests of the corectness or incorrectness of opinion evidence of value, which tests show the values used by the Master to be excessive.

(7) The refusal to take into account, or be influenced by, values fixed by actual purchase and sale of similar, nearby and adjacent lands.

(8) On pages 124 et seq., the allowance of additions to values for clearing and grubbing, which operates to bring the values of complainant's lands above the values of similar nearby and adjacent cleared lands.

(*b*) In arriving at and fixing such values for real estate and right of way, the Master proceeds upon erroneous and improper methods of valuation, in that, to-wit:

(1) Lands in considerable or large tracts are considered and valued upon the basis of adjacent or nearby lands subdivided into small lots, and upon the basis of present demand for and immediate sale of the whole of such lands at prices which were paid for a small number of lots out of a larger number in the vicinity.

(2) The assumption is given effect, that there would be immediate demand, at high prices, for all the South Shore lands now occupied by the railroad.

(3) The detrimental effect of the railroad, as giving a lower value to lands in its immediate vicinity for other than railroad pur-
337 poses, was not taken into account, in that the railroad lands were considered of the same value as, and favorably compared with, residence and high-class business property located in better parts of the municipalities where those lands lay.

(4) Principal and main streets in municipalities were assumed to be projected through and on to the lands of complainant, and it was assumed that there would be immediate demand for all railroad

lands thus assumed to be on such streets, for the same uses as occupied lands now on such streets or in the vicinity are now devoted to.

(5) Values which are based upon purchases for railway purposes are accepted, resulting in the inclusion of the value, and elements of value, for railway purposes forbidden under the Minnesota Rate Cases.

(c) In valuing the property of complainant, the Master places high and excessive values, in that:

(1) He found the total value of the lands of the complainant in Michigan to be $1,780,239, whereas the true value, and the value proper for use in a rate case, was, and is, much less, excessive values being placed upon the lands in each of the counties of Chippewa, Mackinaw, Schoolcraft, Marquette, Baraga, Houghton, Ontonagon and Gogebic.

(2) On pages 95 to 99, he valued trackage rights in streets (erroneously included) at much in excess of cost to produce, or to reproduce, and in excess of any value therein belonging to complainant.

(3) On pages 118 to 124, he assumed that to reproduce the earth grading upon complainant's line would cost thirty cents a cubic yard, whereas, the true cost to reproduce, and the real reproduction value and the value proper for use in this proceeding does not exceed an average of twenty-five cents a yard.

(4) On pages 134 to 136, he finds a unit price for ties of thirty-nine cents each, notwithstanding the records and reports of complainant to public boards in Michigan show tie prices to be considerably less, and notwithstanding the actual purchase price and value of ties is and has for several years been less.

338 (5) Notwithstanding the weight of the evidence shows that ballast does depreciate and that it must be renewed and replaced from time to time, to keep it in 100 per cent condition, and that it now exists on complainant's railroad in a depreciated condition, he, on pages 138 to 145, refuses to allow for its depreciation, and erroneously finds and determines that there is no depreciation in it.

(6) On pages 145 to 157, he adopts as the price or value, or cost of reproduction, of "Tracklaying and surfacing" $600 a mile, whereas, its real value or reproduction cost is not shown by the preponderance of evidence to exceed $526 a mile on complainant's railroad.

(7) He refuses to depreciate "Tracklaying and surfacing" though the same does depreciate and now exists and did in 1913 exist, in complainant's railroad in a depreciated condition, and though the track structure, made up of ties, rails, frogs, switches and crossings, track fastenings, and track laying and surfacing as a whole does depreciate, and is now and was in 1913, in a depreciated condition, and the track laying and surfacing, as a whole does depreciate and was and is in fact depreciated in like proportion as do and are the other items of the track structure.

(8) On pages 180 to 182, the value is improperly increased and enlarged by allowance for and addition to property values of, a con-

structive percentage of two per cent as "Engineering on Equipment."

(9) On pages 147 to 203 he adds on account of "Contingencies," $400,000, without sufficient proof that contingencies in that, or in any account, existed in the property or would inevitably occur in a reconstruction, or were incurred or paid for in construction of the property and against the contention that such item is not proper for allowance in rate cases.

(10) On page 204, he allowed and included in the value of complainant's property, on account of "Legal Expenses during Construction," $51,400, notwithstanding the weight of evidence indicates that the allowance therefor should not exceed $25,000.

(11) The amount allowed on pages 207 to 219, as "Interest during Construction" is more than any proportion of the value of complainant's road attributable thereto, is greater than any amount shown to have been expended thereof by complainant out of capital, and is greater than any amount which would be expended in the event of reproduction.

(12) The allowance, on pages 203 to 218, of $100,000, on account of "Taxes during Construction," is improper, as there is no
339 proof that taxes would be paid, or of the amount that would be paid, in case of reconstruction, or what was actually paid during construction, and during the period of construction of complainant's railroad, taxes were imposed upon gross earnings of railroads, the property being exempt.

(13) The allowances and additions, on pages 219 to 224, on account of "Working Capital" and "Stores and Supplies" are excessive, in that the amount allowed for stores and supplies is ample for both items.

(14) The amounts allowed for depreciation upon various of the elements or items of property are insufficient.

(15) The amount of $300,000 added to the appraisal on pages 224 to 234, on account of "Appreciation" is not sustained by the evidence and the existence of any appreciation in the roadbed of complainant, which would increase its condition above the 100 per cent inventoried and included in the appraisal, is not proven, and there is no proof from which it is possible to find that appreciation of $300,000, or any other amount, exists in complainant's railroad. Nothing was included in complainant's inventory for appreciation, and no notice or intimation was given of a purpose to claim or add for it, until the argument.

(16) The allowance, or addition to the property, of items listed in schedule No. 39, pages 206-7 of the report, under "Organization, administration and general expenses during construction" is improper.

(17) The exceptions to the value of the property and the particulars stated are not intended to exclude other exceptions which are comprehended in the general exception to the fixing of the value of the Michigan property at $13,901,938, and the right is reserved to specify objections to every item of property entering into the final value.

Exception No. 17.

Values—Contingencies.

That they except to so much of said report, appearing on pages 194-195 and 203, as is hereinafter set out, as follows:

"From the foregoing evidence, I find that in the reproduction of complainant's property, there are costs which are certain to be incurred for certain purposes which can be foreseen, and the amount of which can be estimated with reasonable certainty; that according to universal experience, the total cost of reproducing the property will exceed the total of the costs, thus foreseen and estimated
340 by reason of additional costs arising from mistakes and unforeseeable happenings, that these additional costs are by their very nature such that their amount cannot be foreseen or estimated in the manner and with the degree of certainty that the foreseeable costs can be estimated, but that they can be estimated on the basis of general experience and the law of averages; that according to such experience these additional unforeseeable costs usually amount to, on the average from ten to fifteen per cent of the total of the estimated costs of Schedules 3 to 28 inclusive, that, according to the weight of evidence in this case, the amount of such unforeseeable costs to be estimated on the reproduction of complainant's property would be ten per cent of the total of the estimated costs of Schedules 3 to 28 inclusive, amounting to the sum of $782,306; that although an allowance of this amount would be supported by the weight of evidence I do not make such allowance, but in view of the uncertainty pertaining to the subject, and on the principle of resolving all doubt in favor of the defendant, I have decided to allow for contingencies the sum of $400,000, the same being little more than one half of the amount last named and more than $79,000 less than the amount allowed for contingencies by the defendants' expert, Mr. Hansel." (Pp. 194-195.)

"From all the evidence in the case, I am convinced beyond a reasonable doubt, not that the $400,000 which I have allowed for contingencies is the exact amount of the additional costs that would be incurred in the reproduction of complainant's railroad resulting from contingencies, but that that amount is a fair and conservative estimate of the minimum of such additional costs, arising from contingencies not taken into account in the other estimates." (P. 203.)

Exception No. 18.

Values—Appreciation.

That they except to the entire discussion, conclusions and findings of the Master upon the subject of appreciation, as comprehended in the report on pages 225 to 234 inclusive, and particularly to so much of said report as finds there is proof of the amount of appreciation existing upon complainant's property, or that the fact or the

existence of appreciation is proved by contradicted evidence, or that appreciation of the character described and allowed for, is proper for addition in a rate case, or that the proof upon or the question of law or fact involved, in any of those assumptions, appears in this case beyond possibility of reasonable doubt.

341 Exception No. 19.

Values, Created by Operating Expenses, Deduction of.

They except to such report and to its conclusions and findings as erroneous, in that it finds the value of the property of complainant and of the portion thereof attributed to, and which is required to be supported by, the Michigan passenger business, to exist in too great an amount and value, due to the failure to make deduction therefrom for that part thereof created or paid for out of operating expenses, and on page 241 et seq. thereof, the Master refuses to make such deduction; that the amounts of property created out of operating expenses are indicated by the testimony to be large, that it was incumbent upon complainant to show the amounts thereof, in order that they might be deducted from the value and that in the absence of such proof, no finding of a value of complainant's property which should be supported by rates was possible.

Exception No. 20.

Values, Contributed by Public, Deduction of.

They except to such report on the ground that its conclusions and findings are erroneous in failing to find, and deduct from the value of complainant's property to be supported by rates, as claimed by defendants, the value of property included in the inventory, which was contributed to complainant by the public for railroad use, and in determining on page 239 thereof, that property so contributed or obtained is properly added to the inventory and made a part of the value to be sustained by statutory rates.

Exception No. 21.

Values, Division of Common Between Passenger and Freight.

They except to the division between services of property used commonly in passenger and freight services, as made in such report on pages 245, et seq. thereof, as erroneous in the particulars, severally and collectively, as follows:

(*a*) That neither the basis of the time of use by the respective services, as proposed by defendants, nor the alternative basis,
342 using the modified revenue train-mile ratio, as computed by defendants, was used.

(*b*) That the amended modified revenue train-mile ratio, as adopted, is erroneous, as it attributes to passenger business a greater

amount, volume and value of property, and to the freight business a lesser amount, volume and value of property, than is used by them respectively. The errors therein are in each of the particulars, and the exception is for the reasons severally and collectively, that:

(1) It does not give effect to the time, value or amount of use by the respective services.

(2) In the elimination from the percentage as is done on pages 256 to 267 of the report, of the time of freight trains engaged in stational service of the part of their time spent on exclusive freight tracks, too large an amount of time is deducted, due to the use of too great a mileage of exclusive freight track, and of too small a mileage of common track, and due to the assumption that the volume of use or stational time per track mile, is the same for both common and exclusive tracks.

(3) In dividing as described on pages 256 to 267 of said report, that statistical switching mileage of complainant between passenger and freight business for addition to the train mileage to reach the modified train-mile ratio, too great an amount of switching mileage is attributed to exclusive tracks and too small an amount to common tracks.

(4) In arriving at the modified revenue train-mile ratio which the Master uses, the applicable presumptions of law are reversed by him, and, instead of resolving the doubts which existed in favor of validity of the statute and rate, he resolved doubtful questions against the sufficiency of the rates.

(5) The division made of common property between passenger and freight services, is dependent solely upon opinion, without adequate supporting data.

(6) The deductions and recomputations by which complainant alters defendants' modified revenue train-mile ratio, which deductions and recomputations are accepted by the Master as described on pages 256 to 267 of the report, depend largely on the assumption of unproven conditions, on which there is no testimony; the assumptions without evidence being:

That stational service occurs in equal volume on exclusive and on common tracks.

343 That the statistical switching mileage is made on exclusive tracks in the same relative proportion per track-mile as it is made on common tracks.

(7) Certain mileage of exclusive ore trackage upon which no stational time is spent or stational mileage made, and upon which none of the time of freight trains comprising the 39.01 per cent of stational time is spent, is used in setting off stational time to exclusive freight trackage, whereas in fact it should not be used because no stational time is included for it. The detail of such mileage is as follows:

American Mine Branch	2.96 miles
Republic Mine Branches	1.48 miles
Champion Branch	.97 miles
Imperial Mine Branch	2.80 miles
Beaufort Mine Branch	1.10 miles

(8) Certain exclusive freight track not operated in 1912 or 1913, and some abandoned exclusive freight track, is included for the purpose of drawing to it, and away from the common trackage, a portion of the stational time, for the purpose of reducing the freight side of the modified revenue train-mile ratio. As such mileage was not in existence or was not used, it results that no stational time could have been spent on it, and, therefore, it is not to be used in reducing expenses due to stational time upon it, as exclusive freight trackage. The detail of such mileage is as follows:

Hunter's Branch	4.82 miles
Danaher and Northern Cooperage Branches	8.38 miles
Old Negaunee Mine Branch	.96 miles

Exception No. 22.

Report Based on Operations of a Single Year.

The defendants except to the refusal of the Master, as shown on record pages 10716-10718, and mentioned on report pages 363 to 366, to permit the introduction of, or to consider, the report showing complainant's passenger and other earnings for the fiscal year 1914, and except to such report in its entirety as not including any findings, determinations, values, expenses, earnings and net revenues as relating to operations since June 30, 1913.

344 Exception No. 23.

Unearned Increment as Income.

They except to the conclusion and finding as expressed on page 323, et seq. of said report and given effect therein, that the unearned increment in lands and other property, due to increase in values which complainant has been permitted to include in the value of its property and held to be entitled to a return upon, is not an income and is not to be considered in determining the sufficiency of the rate of return as against the claim of confiscation.

Exception No. 24.

Revenues—Mackinaw Transportation Company.

They except to said report, and to its conclusions and findings, on pages 173 et seq. in that the amount of earnings set apart and used as the net passenger revenue to support the property used in complainant's passenger business is deficient in that, none of the revenues from passengers carried in complainant's cars over the Mackinaw Transportation Company's carferries, are included, and that the reasons for such exclusion as expressed on such pages thereof are insufficient.

Exception No. 25.

Revenues—Sleepers and Diners.

They except to the assumption in said report and to the incident findings based thereon, on page 405*d*, that the revenues from the operation of sleeping cars are allocated between states and insist that the proportioning of the revenues from the operation of sleeping cars, between states is on an arbitrary basis, the nature of which was not disclosed, and that the revenues from this source should be divided on the basis of direct revenues from the carriage of passengers which would attribute to Michigan $34,364.40 instead of the $30,243.11 of revenue which was considered by the Master as the Michigan proportion of the revenue from sleeping cars.

345 Exception No. 26.

Revenues—Mail Service.

They except to such report and to the findings and conclusions thereof, in fact in the division of the revenue from the service of carrying the mails, too small an amount of the unallocatable revenue therefrom is assigned to intra-state business, and too large a proportion is assigned to interstate business.

Exceptions 25 and 26 are only applicable in case outside operations are declared to be an integral part of the passenger business in determining the sufficiency of the statutory rate.

Exception No. 27.

Operating Expenses—Those for Single Year Used.

The defendants present an exception that such report on pages 282 et seq. is erroneous in its findings and determination, that the operating expenses for the four years, 1910-1913, are not taken and used for testing the validity of the statute, instead of those of 1913 and that those for the later years 1914 and 1915 were not required or permitted to be introduced.

Exception No. 28.

Operating Expenses—Those for Single Year Used.

That they except to said report in that its findings are permitted to stand and are based upon, the accounts, value of property, earnings, and expenses for a single year, whereas there were before the Master accounts and values for at least four years, and there were also available the accounts for other and later years.

Exception No. 29.

Operating Expenses—Elimination of Sleepers and Diners

They except that said report, and its conclusions and findings as set forth on pages 284 to 308*b* thereof, are erroneous, as the expenses of operation of sleepers and diners are not eliminated from
346 the operations of carrying passengers at two cents per mile, and there is not eliminated, as part of the expenses of such outside operations, not only the added (or "out of pocket") costs by reason of doing such business, but also a proper proportion of all costs attributable thereto.

Exception No. 30.

Operating Expenses—Sleepers and Diners.

That they except to the entire discussion, conclusions and findings upon the subject of sleeping and dining cars and outside operations as set forth in said report, on pages 285 to 308 B, inclusive, and to the several computations, exhibits and tabulations through and by which the erroneous principles there laid down, (namely, that the outside operations including sleeper and dining services, are an integral part of the business of carrying passengers at the rate of two cents per mile, and that therefore the expenses of such sleeper and diner service are to be considered as part of complainant's passenger expense in determining the sufficiency of the regulated rates), are arrived at or carried into effect.

Exception No. 31.

Operating Expenses—Still Abnormal.

The defendants except to said report, in that the amounts on pages 278-280 thereof, deducted from the operating expenses of 1913, to eliminate abnormal expenditures, expenditures for additions and betterments, and expenditures for deferred maintenance, so as to reduce the expenses of that year to a normal amount, are insufficient, and that, after the elimination of the amounts deducted, the expenses used for 1913, are still abnormally high and still include expenditures to make good the depreciation of other years and for additions and betterments.

347 Exception No. 32.

Operating Expenses—Annual Depreciation.

The defendants except to so much of said report, found on pages 272-275 thereof, as apparently determine- a public utility, whose

property is kept on a fixed or rising level or percentage of physical condition from year to year, out of operating expenses, to be entitled to reduce the net income by a charge for an annual depreciation or a theoretical depreciation of the current year, particularly in view of the evidence which shows the condition of complainant's railroad, in 1912 and1913, was improved out of operating expenses, and that charges for depreciation of equipment and docks had already been made to operating expenses.

Exception No. 33.

Operating Expenses—Depreciation.

That they except to the language used and finding set forth in said report on page 277 thereof, as follows:

"Complainant further asks me to find, in this connection, and I do find, that it is the rule of law that — public service corporation must be allowed sufficient revenue to pay its operating expenses, to keep up its property and to pay a fair return on the investment; that in accordance with this rule, such a corporation is entitled to and should charge off each year, in addition to its operating expenses, a sufficient sum to take care of the annual depreciation of its property; that the testimony shows that complainant has not, in its accounts, charged depreciation on any of its property except equipment and ore docks; and that to represent a true statement of the financial results of complainant's operations, there should be added to the operating expenses of each year, as shown by the company's books, an additional amount to take care of the depreciation on the remainder of the property on which no depreciation has been charged."

Exception No. 34.

Operating Expenses—Adjustment to Normalize.

They except that said report is erroneous in the statement and conclusion, on page 278, that:

348 "If the tie prices paid in 1913 had been in effect in the three preceding years and if in each of the four years a proper charge had been made for annual depreciation on the bridges, trestles and culverts on complainant's road in Michigan, to say nothing of depreciation on buildings and other property, which depreciation I have not attempted to compute, the average Michigan operating expenses of those years would have been increased by $70,159; the average Michigan passenger operating expenses would have been increased by $21,769; and the average Michigan intrastate passenger expenses would have been increased and therefore the average Michigan intrastate passenger net income reduced by $13,346.

Exception No. 35.

Operating Expenses—Separation to Exclusive Freight Tracks.

That they except to the method followed by the Master, on pages 367-376 of the report in setting off to exclusive freight service the expenses of maintenance and operation of exclusive freight tracks in that:

(*a*) An insufficient amount is set off to such exclusive freight tracks.

(*b*) That the $300 per mile used for industrial spurs and the $375 per mile used for nine branches is insufficient to represent the real cost of maintenance of such tracks.

(*c*) That the division of the expenses of maintenance of side track mileage upon a 3 to 1 equation sets off to freight an insufficient amount of expenses in that the testimony shows the ratio of equation to be 2 to 1.

(*d*) That certain of the exclusive freight tracks, namely, 4.23 miles Negaunee to Winthrop is treated as common, though it is in fact exclusive freight mileage.

(*e*) That certain of the items of expense occuring upon exclusive tracks are not set off to it. The expenses referred to being described in the Master's report on pages 331-3.

Exception No. 36.

Operating Expenses—Division of Account 91 Between Services.

Exception is taken, to so much of said report as set forth
349 on page 340 et seq., as divides account number 91, "Crossing Flagmen and Gatemen," on the basis used, made up of a combination of the revenue train mile and switching ratios, or on any ratio less favorable to the passenger service, than the ratio of switching in passenger and freights.

Exception No. 37.

Operating Expenses—Common—Division Between Services.

They except to the conclusion and finding, as expressed in said report on pages 245 to 267 thereof, that common expenses not otherwise divided between or allocated to passenger and freight services are properly to be divided, and to the Master's practice in dividing the same, on the basis of the modified revenue train-mile ratio as computed by complainant or as adopted by the Master, for the reasons, severally and collectively, that:

(*a*) The method used disregards the actual volume and time of use, which are the proper factors for dividing that part of those expenses incident or due to weather and time, and not to train move-

ment; it also disregards and gives no effect to the gross ton-mile ratio, which is to be considered in dividing those expenses which are due to train movement, and which are the result of wear and of the use of the tracks and road bed by trains.

(*b*) The method used passes over, and the Master refused to apply, a basis which is as favorable to the validity of the rate as is the defendants' modified revenue train-mile ratio, which ratio more nearly approximates correct results than does complainant's modified revenue train-mile ratio, though even the defendants' modified revenue train-mile ratio reaches results too favorable to complainant.

(*c*) The method used divides expenses due to time and weather upon a basis having no proper relation to their causes.

(*d*) In the computation of the modified revenue train-mile as adopted and applied by the Master, the several imperfections, which are hereinbefore described and set forth in Exception No. 21 appear and are herein, so far as applicable, repeated as applying to the division of common expenses.

350 Exception No. 38.

Operating Expenses—Revenue Train Mile, Division of.

That they except to so much of said report as is found on page 251 thereof as follows:

"My conclusion is that the extent of the use made by each service of the common property in the operation of revenue trains is to be measured by the distance moved by the trains and not by the time consumed in making this movement; that the unit of use is therefore, a distance unit; and that the property is to be divided on the basis of the number of miles traveled by the trains in each service respectively."

and to all discussion, findings and determinations upon which the conclusion stated is based.

Exception No. 39.

Loss of Freight Engine Power Due to Passenger Service.

Exception is taken, to so much of said report as expressed on page 334, et seq., and 335, et seq., thereof, as finds that there is proof of loss of power in the freight engines due to any super-elevation of curves for passenger service, or as finds that any amount can be fixed for the cost thereof measured by use of fuel, or in any other manner or as assumes or finds any super-elevation of rail to exist, or to have existed on the D. S. S. & A.

Exception No. 40.

Excessive Maintenance for Passenger Service.

Exception is taken, to so much of said report as expressed on pages 334 and 337 thereof, as finds the evidence to show that complainant's line is better maintained because of the passenger service thereon, than it would be or then necessary if it was maintained for the freight service of complainant's line only, or that the net results from freight service would be greater if the line were maintained at a lesser cost.

351

Exception No. 41.

Freight Expenses Caused by Passenger Service.

They except to the portion of said report found on pages 337 and 338 et seq., which carries the inference that expenses are or were in 1912 or 1913, on the D. S. S. & A. charged to freight service, which would more properly be charged to passenger service or which are or were caused by or for passenger service, or that the amount- of any such expenditures or costs are determinable or are properly determined in the amounts there fixed or set forth.

Exception No. 42.

Operating Expenses—Division Between Inter and Intra State Passenger.

Exception is taken to the division of common Michigan passenger expenses between intrastate and interstate services on the ratio of the number of passengers carried one mile, as described in said report on pages 334 to 348 thereof, and carried into effect in the exhibits, as the cost per passenger per mile is so affected by density and volume of traffic that, due to the greater number of passenger miles in intrastate, as compared with interstate business, the cost per passenger per mile is and was of necessity less in intrastate than in interstate service.

Exception No. 43.

Operating Expenses at Stations, Division Between Intra and Inter State Passenger.

Exception is taken to the division, between intrastate and interstate passenger business, of the accounts No. 63—"Station Employees" and No. 66—"Station Supplies and Expenses" on the relative number of intrastate and interstate passengers, as described in said report on pages 348 et seq., thereof, and carried into effect in the exhibits, as such division should be on a ratio not more unfavorable

to intrastate passenger business than the ratio of the number of passengers carried one mile in each service.

352 Exception No. 44.

Loss Due to Reduced Rates.

Exception is taken to the determinations and findings, and to the reasons expressed therefor on pages 250 et seq. of the report upon which the Master bases and allows an estimated loss due to, and claimed to be, the necessary result of putting into effect the rate of two cents per passenger per mile, the allowed loss being equal to the difference between the earnings under the rates now and heretofore in force, and the earnings on a flat rate of two cents per passenger per mile applied to the identical amount of business done in the years considered on the assumption that the probable earnings under the two cent rate would be that amount less than under the previous rate, for the reasons severally and collectively, that:

(*a*) There is no proof and no presumption that there will be any loss.

(*b*) There is no basis for a conclusion that increased traffic sufficient to recoup or equalize any loss in revenue per passenger mile due to the decreased rate, will not result therefrom.

(*c*) Said rate never having been put into operation on complainant's line, there is no experience and no basis on which to estimate or to find any loss due to putting it into affect.

(*d*) There is no testimony or evidence that the decreased rate will not so increase the volume of traffic that there will be no loss of revenue.

(*e*) The presumption or the rule of experience that increased traffic produced by the decreased rate will be sufficient to overcome, in whole or in part, the loss in revenue per passenger per mile due to the decreased rates, has not been overcome.

(*f*) The conclusion, as set forth on pages 354 et seq. and 358 et seq. of said report, that the reduction of the passenger rate in 1907 from four to three cents, did not result in increased traffic is unsupported by the evidence being that increased business did result from such reduction.

353 Exception No. 45.

Loss—Probable Earnings under Reduced Rate.

They except to the entire of the Master's discussion in such report, on pages 350 et seq., and to all findings and determinations based thereon, on the subject of the "probable earnings under the two cent rate" and insist that no reduction for a possible decrease in net revenue is permissible until after a test of experience furnished by putting the rates into effect after a reasonable time, and they except that there is no proof to sustain the Master's conclusions, findings or deductions on that subject.

Exception No. 46.

Values and Operating Expenses, Division Between Inter and Intra State Freight.

The defendants except to the said report in its determinations and findings, as declared on pages 366 et seq., thereof, as to the amounts of property, revenue and expenses attributable to complainant's freight business, and to the intrastate proportion thereof, as improper for the reasons, severally and collectively, that:

(*a*) An insufficient proportion of property and expenses is assigned to freight business, with the result that passenger business is thereby unduly burdened.

(*b*) In the division of the property, and expenses allocated and assigned to the freight business, between intrastate and interstate freight services, an excess proportion is assigned to intrastate business.

(*c*) In the division of property and expenses between the intrastate and interstate freight business, the allowance of a greater amount of stational expense as attributable to intrastate business than is attributed to interstate business is improper and is founded on improper and insufficient evidence.

Exception No. 47.

Operating Expenses—Greater Stational Costs for Intrastate Freight.

They except to so much of the Master's report, found on
354 pages 369 et seq. and to the findings and determinations based thereon, as is to the effect that there is a proven greater cost for stational service for intrastate than for interstate freight, and insist that the Master has disregarded the proofs in this respect, and they particularly except to the passages of the report thereon as hereinafter set forth.

"But the complainant claims that even if the haulage cost in the two services is the same per ton mile, nevertheless terminal and stational expenses cannot be properly divided on the relation of the freight ton miles made in the intra and inter state services, respectively, but should be divided in proportion to the tons handled in the stations and terminals.

"It seems to me that in this contention complainant is correct. The cost of assembling and delivering freight in stations and terminals has no relation to the miles over which such freight is carried." (Pp. 369-370.)

"The total of these stational and terminal expenses thus determined aggregated in 1912 $405,335, and in 1913 $469,405." (P. 371.)

"It was shown by the undisputed testimony that the stational or terminal service performed in interchanging car-load freight with other carriers at junctions is much less per car than that performed in originating or delivering it at stations on the line of the road, and that

on the average it was not more than one-fourth of the latter." (P. 372.)

"It is claimed by the defendants that the testimony upon which I base my findings as to the average stational service given a ton of freight in the interchange thereof with another railroad consists entirely of opinion testimony, and that opinion testimony does not furnish a sufficient basis for such a finding.

"The finding, however, is based only in part on opinion testimony as hereinafter explained, and such opinion testimony was not of the same character as that which was criticised in the Minnesota Rate Cases. The opinion evidence on this point in this case was from employees of the complainant thoroughly familiar with its method of interchanging freight, and of the amount of service required therein. It was shown further, undisputed in the case, that in general such interchange was made in loaded cars placed on delivery tracks conveniently arranged so that little expense was involved in either putting the car on to the exchange track or taking it therefrom.

"It was further shown that the complainant, in receiving freight at stations on its line, is compelled in general, first, to spot cars to be loaded, often at industries considerably distant from its main line, then, when the cars are loaded, haul the cars to its main line; and that in delivering freight, the service is the same with the process reversed.

355 "It was further shown in the evidence that at junction points usually several cars at a time, amounting at some junctions to more than 500 cars a week, are interchanged, whereas in the delivery or receipt of freight at stations on the line, the deliveries are in fewer car lots, there being over 200 stations on the road in Michigan where freight is originated and delivered as against only twelve junction points where freight is interchanged. The fact that the interchange business involves less stational service than is involved in originating and delivering freight at stations is proved by undisputed evidence; the amount of this excess is shown only by opinion evidence. From this opinion evidence I find that the relative service on this interchange business does not exceed one-fourth of the service that is performed in originating or delivering freight at stations on the line of the road. The results of this division are as above shown." (Pp. 374-375.)

They further except that the failure to set off and separate from the other business the shorthaul ore business, and its stational service, entirely destroys the value of the Master's separation of costs between inter and intra state freight business, and that if such service were included the cost of interstate freight service on complainant's line, as compared with the cost of the intrastate freight service, would be several times as much per unit.

Exception No. 48.

General, Rates of Return and Property.

The defendants except to the said report and to its determinations and findings as a whole, as erroneous and contrary to the evidence, as:

(*a*) The net revenue shown therein to be earned by and attributed to, the intrastate passenger business for each of the several years embraced in the report, are less than under all the evidence they should have been found to be.

(*b*) The amounts of property and expenses attributed, assigned or allocated to the intrastate passenger business for each year comprehended in said report, are greater than under all the evidence, they should have been found to be.

356 In Conclusion.

The several heads or sub-divisions of each separate exception are intended to operate both cumulatively and separately, and each separate sub-division is made tantamount to a separate exception. The reference to pages in the exceptions are not intended to be exclusive, but the exception is intended to comprehend within its language full exception to all matters and things, including the computations to carry any finding into effect, stated in the report or exhibits bearing upon the identical subject, without regard to whether it is included within the pages stated in the exception or not.

Wherefore these defendants respectfully submit that the report of the Master should be overruled, set aside and held for naught, and a decree entered sustaining the validity of the rate statute and dismissing the bill.

Dated February 19, 1917.

ROGER I. WYKES,
Solicitor for Defendants.

Filed February 20, 1917.
ELMER W. VOORHEIS, *Clerk.*

357 18.

In the United States District Court, Eastern District of Michigan, Southern Division.

THE DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Complainant,

vs.

GRANT FELLOWS, CASSIUS L. GLASGOW, LAWTON T. HEMANS, Charles S. Cunningham, John R. Van Evera, Morgan W. Jopling and Fred S. Case, Defendants.

Complainant's Exceptions to Report of Special Master in Chancery Herein.

Comes now the Duluth, South Shore & Atlantic Railway Company, complainant herein, and excepts to the report of Herbert L. Baker, Special Master in Chancery herein, filed in this case on the first day of February, 1917, and for cause of exception, shows:

First. That said Special Master has in his report, in determining the value of complainant's property in the state of Michigan, used in its intra-state passenger business in Michigan, deducted from the real value of the complainant's real estate, shop buildings, shop tracks and shop machinery at Marquette, and complainant's round-house at Thomaston, and complainant's passenger station at Marquette, as found by him, the sum of $45,593.00, upon the theory that the proportion of the real value of the said property represented by said sum, was devoted by complainant, to railroad business in Wisconsin; whereas the Master should have found that all of the real value of said property as found by him, should be included in the
358 valuation of the property of complainant, utilized by it in its intrastate passenger business in Michigan. (Pp. 235-237 of Report.)

Second. That the Master in computing the value of complainant's property used in its intrastate passenger business in Michigan allowed for the item of taxes during construction, only the sum of $100,000; whereas the amount which should have been allowed by him for that item, is at least $150,000. (Pp. 213-218 of Report.)

Third. That the Master, in computing his modified train mileage ratio, used for the division of common property and for the division of certain common expenses between the passenger and freight business, included all of the time spent by freight trains at stations as time in which switching movement by such trains were being made; whereas, the facts are as shown by the evidence, that a large part of the time of trains at such stations, amounting to at least 15% thereof, is spent by train crews in unloading less than car-load freight, waiting for orders, or waiting for leaving time; and that during such 15% of the time, no switching operations are carried on. (Pp. 265 of Report.)

Fourth. That the Master, in considering the result of the operations of complainant's railroad in Michigan, failed and refused to consider and include with the operating expenses of said railroad, any charge for the annual depreciation of bridges, trestles, culverts and other structures; whereas, he should have included with the operating expenses, the annual depreciation of said structures as shown by the evidence introduced in the case. (Pp. 271-275 of Report.)

Fifth. That the Master, in computing the results of complainant's operations in Michigan in the year 1913, deducted from the operating expenses of such year, as shown by complainant's accounts, the sum of $102,148.00, all of which sum had been actually expended by complainant in said year in the state of Michigan, in the
359 maintenance and up-keep of its railroad property; whereas the said sum having been properly expended for said purpose should have been included in the operating expenses of complainant for said year. (Pp. 278-280 of Report.)

Sixth. The Master found that the minimum rate of return to which the plaintiff is entitled under the constitutional guaranty, is 6.5%; whereas, he should have found such rate of return to be at least 8%. (P. 389 of Report.)

Seventh. That the Master, in fixing the value of compplainant's property in Michigan used in its intrastate passenger business, allowed for the item of appreciation of road-bed, only the sum of $300,000; whereas, the evidence in the case showed that such appreciation amounted to at least $553,000. (Pp. 225-234 of Report.)

Eighth. That the Master, in finding the amount of taxes paid to the state of Michigan on the property of complainant located and used in its railroad operations in Michigan in the year 1913, deducte l therefrom the sum of $673.00, as representing the taxes on the Michigan property which was assigned by the Master to the business in Wisconsin, as shown in our first exception; whereas, he should have found the full amount of taxes paid by complainant on all its Michigan property without deductions. (Pp. 350 of Report.)

(Signed) A. B. ELDREDGE,
(Signed) PIERCE BUTLER,
Solicitors for Complainant.

W. D. McHUGH,
JOHN E. TRACY,
Of Counsel.

Filed February 26, 1917.
ELMER W. VOORHEIS, *Clerk.*

360 19.

In the District Court of the United States for the Eastern District of Michigan, Southern Division. In Equity.

In Equity.

No. 4117.

DULUTH, SOUTH SHORE AND ATLANTIC RAILWAY COMPANY, Plaintiff,

vs.

CASSIUS L. GLASGOW et al., Defendants.

Opinion.

Prior to 1889, statutory rates of passenger fares in Michigan for railroads in plaintiff's class were three cents per mile in the Lower Peninsula and five cents per mile in the Upper Peninsula. 1 How. Stat. (1st Ed.) Section 3323. From 1889 to 1907, such rates of fares were respectively two and one-half cents and four cents per mile. 2 C. L. 1897, Section 6234. From 1907 to 1911, the rates were two and three cents per mile. Act No. 54 of Pub. Acts of 1907. In 1911, the State Legislature departed from what apparently had become the settled policy to permit a higher rate to be charged by railroads in the Northern Peninsula than in the Southern and

enacted the statute which is here attacked and which fixes a maximum passenger rate of two cents per mile for all roads of plaintiff's class in Michigan. Act No. 276 of Pub. Acts of 1911.

Probably the adoption and long continuance of the former policy of allowing higher rates of passenger fares in Northern Michigan was induced, in a large measure, by the greater difficulties of transportation which exist in that part of the state. These difficulties result from many different causes, such as prolonged and severe winter seasons and other unfavorable climatic conditions, entire absence of large cities, long distances between small cities and villages, sparsity of population and paucity of manufacturing plants and commercial enterprises other than those connected with the mining industry, all directly tending to reduce railroad traffic of all kinds to a minimum. While courts may not inquire into the motives which actuate legislative bodies in the enactment of laws, such a sudden and complete reversal of legislative policy as the reduction of rates of fare fifty per cent within a period of four years and the placing of railroads surrounded by such adverse conditions upon a parity with others much more favorably situated, increases the chances of unintentional and inadvertent transgression of constitutional limitations in specific instances and emphasizes the necessity for the most careful consideration of the merits of a case like the present one.

In July, 1911, after the enactment of the statute here under consideration but before it went into effect, this suit was commenced against the then Attorney General of the State of Michigan, the members of the State Railroad Commission and certain private patrons of the railroad, to restrain its enforcement upon the alleged ground that, as applied to this plaintiff, the law was in violation of several provisions of the Federal Constitution and hence invalid. Many of the claims and contentions, put forth and urged by both parties during the earlier stages of this inexcusably prolonged litigation, have been settled by the decisions of the Supreme
361 Court and are now abandoned. The large and important question which still remains to be determined is whether the so-called Michigan Two Cent Passenger Fare Law, as applied to plaintiff's railway, is confiscatory and, therefore, in violation of the "Due Process" clause of the Fourteenth Amendment.

When the bill was filed in this case, an application for an interlocutory injunction was made, and, pending the hearing upon such application, a restraining order was issued. For reasons which need not be stated, no complete hearing has been had and no decision has been made upon the application for a temporary injunction, but by consent, the original restraining order has been continued in force until the present time. Pursuant to stipulation and by order of court, the restraining order was conditioned that plaintiff should issue to each person buying Michigan intrastate passenger transportation a receipt or certificate by which it should bind itself to refund to the holder thereof the excess fare paid, if the validity of the statute finally should be sustained. The redemption of the rebate

receipts and the re-payment of excess fares were required to be secured, at first, by bond, and later, in addition to the bond, by the deposit of the moneys so received in designated banks subject to the order of the court. The fund so on deposit now amounts approximately to the sum of $750,000.00, the disposition of which depends upon the final outcome of this suit.

In May, 1912, the case was referred to a Special Master to take the proofs, to make the necessary computations, to find and state the facts and to report his findings and recommendations to the court. At intervals during a considerable period of time, very extensive proofs were taken, the testimony aside from many exhibits covering more than twelve thousand typewritten pages. The transactions and operations of plaintiff in the four fiscal years, 1910 to 1913, including its revenues, receipts, expenses and expenditures in each of those years, and also the condition and value of the property employed in each branch of its service, were inquired into and examined in minute detail. Elaborate schedules, tables and computations, based upon the theories and formulas of eminent engineers and expert accountants, were presented. Voluminous briefs were filed and lengthy oral arguments were had. Finally, on February 1, 1917, the Master filed a carefully prepared and well considered report covering more than 500 printed pages, and, in the main, sustaining the contentions of plaintiff. This report and the numerous objections and exceptions thereto are now a part of the present record.

Immediately upon the filing of the Master's report, this court, believing that a final decree directing the disposition of large sums of money, which have accrued since June 30, 1913, and vitally affecting the present and future operations of an extensive railroad system, ought not to be based upon proofs of conditions more than three and one-half years old, suggested and, in fact, insisted that the record should be brought down as nearly as possible to date by proofs taken in open Court and by a new hearing upon the proofs so taken. The suggested course of procedure met with the approval of counsel on both sides and was readily and willingly agreed to and adopted. New schedules, requiring the skilled labor of several experts and their assistants for several months, have been prepared, extensive tests have been made, and supplemental proofs have been taken in open court, covering plaintiff's railroad operations during the four fiscal years of 1914 to 1917 inclusive. The later testimony
362 and investigations have developed important changes, not only in the claims and theories advanced, but also in actual conditions shown to exist. The ultimate decision of the case must rest not alone upon the record made before the Master but also and, more especially, upon the evidence produced and taken at the present hearing.

This case presents all the difficult problems usually incident to rate cases as well as others of large importance not usually found in such cases. Each question, usual and unusual, which, in any way or degree, is controlling of, or has a material bearing upon, the final issue, must be separately considered and determined. To attempt

to do more than to state the conclusions reached and, as briefly as possible, to outline the reasons for such conclusions, would prolong this opinion beyond any reasonable limits.

1. Estoppel.

At the threshold of the investigation, we are met with the contention of defendants that plaintiff is estopped from denying or questioning the constitutionality and validity of the rate statute here under consideration. The somewhat shadowy basis of this contention is the fact that one or more of plaintiff's remote predecessors received from the United States and the State of Michigan grants of land in consideration for the original construction of some parts of the present line of railroad, and the claim that, in at least one instance, the grantee of such lands bound itself and its successors to abide by and to obey all laws of the state which thereafter might be enacted. A recital of the history of the origin and construction of the various parts and divisions of plaintiff's railroad and their consolidation into one system would be a long story. It is sufficient to say that a part of the northern division was built more than fifty years ago. Later, other parts were constructed at different times and by different companies. Plaintiff was incorporated in 1887 under the laws of this State authorizing a consolidation of railroad companies. Afterwards, plaintiff built connecting links and acquired by purchase other branches or divisions, thus forming and creating its present system. Some of the earlier corporations received land grants which, presumably, were fully earned. Of the lands granted, plaintiff has received, either directly or indirectly, only about 82,000 acres. The other lands were disposed of, lost through foreclosure, or retained by the companies receiving them. Except possibly in one instance, no conditions here material were attached to any of the grants. One corporation built about twenty miles of railroad from Marquette to Ishpeming and, in connection therewith, received a grant of lands. One of the provisions of the statute authorizing such grant, accepted by the grantee, was that, "All of said railroad companies shall, at all times and in all matters, be subject to the laws of this state, and to such rules and regulations as may from time to time, be enacted and provided by the Legislature of the State of Michigan, in regard to the management and disposition of the said lands not inconsistent with the provisions of this act, and the Act of Congress making said grant of land to this State." Defendants build their entire structure of estopped upon this patently ambiguous provision of the statute of 1857. Assuming, however, that the statute above quoted was intended to apply to the operations of the railroad and not solely to the disposition of lands, it was merely declaratory of the law as it would have existed in the absence of legislative enactment. It is a far cry from the little illy equipped railroad of half a century ago, through many changes of title and ownership, to the present
363 system nearly 500 miles in length, all of which, except twenty miles, has been acquired from other sources and free from any

uch conditions. This ancient statute forms no part of the law un-
er which plaintiff was organized and, therefore, is not in any sense
charter obligation. At this late day, it is impossible to read into
he statute an intention of the Legislature to bind not only the rail-
oad company then receiving the grant, but also all other companies
hich might, at any time, become associated or consolidated there-
ith, to observe and to obey every rate statute which thereafter might
e enacted even though the enforcement thereof would necessarily
esult in the confiscation of property. This contention cannot be
ustained.

2. Western Division and South Line.

The so-called Western Division (Nestoria to the State Line) of
laintiff's line was originally built as a connecting link and primarily
o create a through interstate road. This part of the railroad runs
hrough a sparsely settled region and the local traffic thereon is con-
iderably less than that upon other divisions of the system. Here
he interstate traffic exceeds the intrastate. However, the traffic of
oth kinds has continuously and substantially increased. Defend-
nts claim that the loss, if any, in plaintiff's passenger business has
ccurred upon this division and contend that the operations thereon
hould be segregated from the operations upon other divisions and
he loss charged mostly, if not wholly, to interstate business. They
urther claim that it was incumbent upon plaintiff to make such sepa-
ation and, not having done so, it has failed to establish with suffi-
ient certainty any right to relief.

The so-called South Line extends from Marquette to Negaunee
nd Ishpeming and was originally built by an independent
orporation as a competing road. In 1884, after it had been
perated for about one year, one of plaintiff's predecessors
urchased this line. Since then it has been used continuously for
oth interstate and intrastate passenger and freight traffic. Its use
n connection with the main line provides substantially a double
racked road between those cities. Defendants claim that the South
Line is unnecessary so far as intrastate traffic is concerned and con-
end that both the revenues derived therefrom and the expenses in-
urred thereon should be eliminated from the computations in this
ase.

These contentions are effectually answered by the rate statute itself,
hich provides "That in computing the passenger earnings per mile
f any company, the earnings and mileage of all branch roads owned,
eased, controlled or occupied, or that may hereafter be owned, leased,
ontrolled or occupied by such company, * * * shall be in-
luded in the computation, and the rate of fare shall be the same on
ll lines owned, leased, controlled or occupied by such company"
Plainly, no division or branch, used for intrastate traffic, can be seg-
egated from the other parts of the line or omitted from consideration
n determining whether a statutory rate is confiscatory or sufficiently
ompensatory. The Legislature, in fixing the rate of passenger fares,
has seen fit, at the same time and in the same statute, to require the

entire railroad line to be treated as a single unit. Under this statute, if the net income derived from plaintiff's intrastate passenger business as a whole is sufficient to yield a fair and reasonable return upon the value of the property employed in that service, it cannot recover, even though it may have suffered serious loss upon one or more divisions of its road. On the other hand, if the net income derived from its intrastate passenger business upon its whole road in Michi-
364 gan is insufficient to yield a fair and reasonable return upon the value of the property employed in that service, it is entitled to a decree, even though such business upon one or more of its divisions may have been profitable. Court decisions upon rate statutes containing no such provisions have little application and are not controlling here.

3. Mineral Range Railroad.

The Village of Houghton is the northern terminus of plaintiff's line of railroad. The Mineral Range Railroad Company owns, maintains and operates a line from Houghton to Calumet, a distance of fourteen miles. Calumet is the largest center of population in the Upper Peninsula of Michigan. The Mineral Range Company does not operate passenger trains between those places, but, under a contract between the two companies plaintiff runs its passenger trains to Calumet over the Mineral Range road and turns over to that company all the passenger fares earned upon its line. The distance from Marquette to Calumet is about 98 miles and, by apportioning to the Mineral Range Railroad 14/98ths of the train expenses from Marquette to Calumet, defendants reach the conclusion that about $20,000 per year is the cost to plaintiff of the operation of its passenger trains north of Houghton. In fact, the actual extra expense is considerably less than such estimated amount, because enginemen and trainmen would receive nearly the same wages if their run terminated at Houghton. The claim is that, in computing net income, this sum of about $20,000 should be deducted from plaintiff's operating expenses. This contention is untenable. Plaintiff's contract with the Mineral Range Railroad Company is in effect a lease of the right of way for passenger trains from Houghton to Calumet in consideration of the passenger fares collected upon that part of the line. Plaintiff's purpose in making the contract was to secure traffic upon its own rails. If plaintiff had leased the right of way for the sum of $20,000 and had collected and retained the passenger fares, no question could arise as to its right to include in its operating expenses the re-tal so paid.

Viewed from another standpoint, this expense is similar to that of advertising and of commissions to outside agents to obtain traffic. No question is raised as to the right to include such charges in operating expenses. Moreover, it appears from the record that plaintiff receives from the Chicago and Northwestern Railroad Company and the Chicago, Milwaukee and St. Paul Railway Company the sum of $14,000 per annum, in addition to passenger fares, for hauling the trains of those companies over plaintiff's line to Houghton and thence

to Calumet. The main consideration for the payment of this money is to enable those companies to reach Calumet. In computing plaintiff's net income this sum of $14,000 has been included in its earnings.

4. Rate of Return.

The two cent rate has not been put into effect on plaintiff's railroad and no tests have been made to determine whether the resulting reduction in fares would stimulate travel to such an extent as to offset the estimated loss. Under these circumstances, defendants insist that, before plaintiff can be entitled to a decree in its favor, it must have established conclusively not only that the statutory rate is not compensatory, but also, that its enforcement will make impossible any substantial return. This question seems to have been decided by the Supreme Court against the claim of defendants in the recent case of Rowland vs. Boyle, 244 U. S. 106-110.

365 To ascertain the loss in each year which would have resulted from the reduction of fares to two cents per mile, plaintiff has computed the amount of fares at two cents per mile for every mile of travel to which the rate could have applied and has subtracted that sum from the amount actually received under the three cent rate. It is certain that this method of computation is unfair to plaintiff, because, owing to competitive conditions, excursion rates, etc., if the two cent rate had been in force, plaintiff would not have received full two cents per mile for every passenger mile of travel. For example, in 1914, this railroad transported state troops about one million passenger miles at a statutory rate of one cent per mile. In its computations of loss, all of this travel has been included at two cents per mile. Again, in 1907, the State Legislature reduced the rate from four cents to three cents. Such reduction of rate did not stimulate travel to an appreciable extent. Hence, it is quite evident that industrial and commercial conditions, rather than rates, determine amount of travel. At all events, as said by the Supreme Court in the case above cited, "The direct effect of the reduction is plain—the remote one is at best a guess."

5. Sleeping, Dining and Chair Cars.

It is believed that, in this case, for the first time in the history of railroad rate litigation in this country, the surprising claim has been put forth that, in computing net income and rate of return, no part of the expense of hauling sleeping, dining and chair cars should be included in the passenger operating expenses of the railroad. This contention, which is urged with earnest insistence, involves the theoretical cutting of each passenger train into sections and charging to the sleeper and diner section a proportionate part, based upon weight, of all operating expenses, without crediting that section of the train with any part of the passenger fares collected. In their computations, defendants have charged to sleepers and diners a proportionate part of each operating expense account (except those in the "traffic" group) including such constant accounts

as superintendence, wages of trainmen and enginemen, maintenance of fences and crossings, and others of like character. The aggregate of these charges, averaging about $175,000 per year, has been deducted from the passenger operating expenses and set aside and disregarded in obtaining the net income from passenger service. In the last analysis, defendant's theory rests upon the assumption that the railroad company is not required by law to furnish sleeper and diner service and that there is, at all times, sufficient space in the day coaches for the accommodation of the traveling public. If this contention were sound, it is safe to say that no railroad of plaintiff's class in the State of Michigan could hope to win a rate case like the present one. But the contention is not sound. As early as 1875, railroads in Michigan were authorized by legislative enactment to use sleeping cars, parlor cars and chair cars for the transportation of passengers and to charge a reasonable compensation for such use in addition to the regular passenger fares allowed by law. 3 How. Stat. (2nd Ed.) Section 6696. That statute has been in force and acted upon for more than forty years. Every railroad of any considerable size in the state is furnishing such service. What formerly may have been a convenience has become a necessity. It is conceded that it would be poor business policy for any railroad to abandon the operation of these cars. In 1911, when the statute here under consideration was enacted, these conditions had long existed and it must be presumed that the Legislature had such conditions in mind and, in the absence of express declaration to that effect,
366 did not intend to limit, alter or overturn fixed and prevailing methods of railway travel and operation. Indeed, the statute itself empowers the railroad company "to regulate the time and manner in which passengers and property shall be transported" and thus, in express terms sanctions the use of all reasonable facilities for the transportation and convenience of the traveling public. No claim is made that the use of such cars is either unreasonable or unnecessary. It is also probably true that the State Railroad Commission, clothed as it is with broad powers, could compel this plaintiff to operate chair, sleeping and dining cars.

Referring once again to the statute here under consideration, we find that therein railroads are classified upon the bases of the gross earnings of passenger trains. No distinction is made between sleeping cars and day coaches. While this classification is not in any wise controlling of the exact question here presented, it is a recognition of the fact that the operation of these special cars is an integral part of the passenger service from which it cannot be divorced by fine spun theories unknown in actual experience and practice.

A subordinate claim of defendants is that, if the operation of sleeping, dining and chair cars cannot be wholly eliminated from consideration, at least the expense of hauling such cars should be divided between state and interstate business upon the basis of the interstate and intrastate passenger miles traveled therein instead of the interstate and intrastate passenger traffic upon the whole line. Elaborate schedules and tables have been prepared showing the number of interstate and intrastate passenger miles in sleeping cars upon

each division of the road. Upon one division the intrastate travel in such cars far exceeds the interstate, while the reverse is true upon the other divisions. This theory is equally untenable. The passenger train as a whole, with engine, baggage cars and all coaches, is a single unit provided for the transportation of interstate and intrastate passengers indiscriminately and alike. The train is run regardless of whether interstate or intrastate, or both interstate or intrastate, passengers are to be carried. Neither kind of traffic is incidental to or subordinate to the other.

6. Mail and Express.

Both parties have treated the carriage of mail and express as an independent branch of the passenger service. As in the case of diners and sleepers, defendants have divided each expense account upon the basis of the space occupied by and the weight of mail and express matter. Plaintiff has adopted a fixed percentage of the total operating expenses as the cost of such transportation. While the two methods are not directly related, the results reached are substantially the same. With the exception of one year, the mail and express business has been profitable and has been a benefit rather than a burden upon the passenger business. In the computations, the results of which are hereinafter stated, this profit has been included in the passenger revenues, while the one year's loss has been disregarded and not deducted from such revenues. Either method of treating mail and express is too unfavorable to plaintiff. This business is a mere incident to or by-product of the passenger service.

Neither mail nor express is handled by railroad employes. For the most part, they are carried in one end of the baggage car and add little or nothing to the general expenses. The extra wear upon the track and track structure is inconsequential and inappreciable. Constant expenses such as the wages of trainmen and enginemen and the cost of the upkeep of fences, crossings, signals, stations,
367 etc., are not at all affected. If these constant charges had been left in the passenger accounts as they should have been, the profit arising from the transportation of mail and express upon this railroad would have been increased more than $20,000.00 per year, and the net income from passenger traffic would have been correspondingly decreased, with a resultant substantial reduction in the final rate of return from intrastate passenger business. However, as before stated, this profit, whatever it may have been, has been credited, in this decision, to passenger revenue.

7. Values.

In view of the conclusions reached, the differences between the parties as to the value of plaintiff's railroad property become quite immaterial and need not be discussed except in a most general way. In ascertaining the values of both fixed property and equipment, plaintiff has adopted and used the theory of cost of reproduction

new, less depreciation. This method has received the approval of many courts and, perhaps, is the best yet devised for measuring the values of railroad property and industrial plants which are not bought and sold in open market and which may be said to have no market value in the sense in which that term is usually employed. Yet the adoption of this method to the exclusion of all other factors is both unsatisfactory and unsafe. One railroad property may be much more valuable than another, even though the cost of the reproduction of each may be the same. Some railroads are worth much more and others much less than the actual cost of replacing them. For example, it may well be doubted that, if plaintiff's railroad were now being constructed new, two lines would be built paralleling each other from Marquette to Ishpeming, or that the Western Division would be placed in its exact present location. Industrial activities and density of population and traffic are important elements which cannot be ignored in reckoning values of railroad property.

Some of plaintiff's claims as to values must be wholly rejected. In any plan for the actual construction of a railroad and in the preliminary estimates of its cost, an allowance for unforeseen contingencies may be proper, but, in determining whether a given rate is confiscatory, indulgence in speculation as to what may or may not happen cannot be permitted. The claim for application of roadbed is quite uncertain and speculative. Undoubtedly, a well maintained roadbed increases in efficiency and value with age. The older it becomes the less is the cost of its repairs and upkeep. But, in a case of this kind, an allowance for such appreciation must be supported by positive proofs which measure the value thereof in terms of money. The reproduction cost theory also includes a theoretical charge for "Engineering on Equipment." In this day and age, locomotives, cars, both passenger and freight, and all equipment are standardized and the prices thereof can be readily ascertained without the assistance of engineers. In any event, this engineering cost, if any, is included in the price paid and, in this case, is fully represented in the estimates of both parties.

On the other hand, whether values be measured by constantly increasing unit prices, prevailing from year to year, or "normal" unit prices of several years ago, the estimates and appraisals prepared and presented by defendants are in many respects much too low:

Lands.—A great volume of testimony by many witnesses has been taken on the question of the value of the right of way and station grounds of this railroad. In the main, defendants have adopted the lowest values placed thereon by any of the wit-
368 nesses. The Master, who saw and heard the witnesses, fixed the value of these lands, in 1913, at the sum of $1,780,222.00. Defendants contend that the actual value is upwards of $600,000.00 less than that sum. Without going into details and disregarding all claimed extra values arising from unused shore rights, rights of way in streets, rights of surface support through mineral lands, locations peculiarly adapted to and suitable for railroad purposes,

and added increments for platting into lots and streets, it is certain that defendants' estimate is at least $400,000.00 too small.

Grading and Track Laying and Surfacing.—These items have also been the subjects of much discussion and controversy. Defendants claim values nearly $600,000 less than those found by the Master. In respect to grading, the difference consists largely in the different unit prices adopted, and, in respect to track laying and surfacing, in the diverse claims as to what is included therein and as to what methods should be employed. A careful examination of the evidence leads to the conclusion that the Master's findings are fully and fairly sustained. Defendants' estimates should be increased to the sum stated in his report.

Ties.—Defendants' valuation of ties is less than the price actually paid by plaintiff during the last four years. Their estimate upon this item should be substantially increased.

Working Capital.—Defendants have not allowed anything for working capital although the record shows that plaintiff has had on hand upwards of $100,000 for use in its current business. Working capital is necessary to the successful operation of any railroad and, when actually possessed, should be included in the appraised value of its property.

Defendants' estimates upon other items of both fixed property and equipment should be increased. If it were necessary, in the decision of this case, to determine accurately the value of plaintiff's property used in its railroad business, defendants' claimed values would have to be increased more than one million dollars.

8. Factors, Ratios and Divisions.

This case is not an exception to the general rule in rate cases that the greatest difficulties are encountered in attempted divisions of common property and expenses, not capable of direct allocation, between passenger and freight business. In the main, but with some exceptions, both parties agree that the final division of common passenger property and expenses between state and interstate business shall be upon the basis of the number of passenger miles of transportation in each class of traffic. Plaintiff rightly contends that the cost per mile of intrastate passenger transportation is more than that of interstate, but concedes the practical impossibility of proving definitely and accurately the amount of such extra cost.

In the division of common property and expense, (particularly the right of way, station buildings and grounds and track structure schedules and expense accounts in the "maintenance of way and structures" group) three radically different factors or ratios have been applied and used, and a fourth has been suggested for possible application by the court, if the others shall be rejected. Plaintiff has adopted and advocates the so-called Modified Revenue Train Mile method of division. By this method, unallocated property and expenses are divided between passenger and freight service upon the basis of the number of revenue train miles (including, or modi-

fied by, switching movements upon common tracks) made
369 in each service. Here the revenue train is the common unit for all purposes of comparison. Differences in character of service performed and results accomplished are not recognized. Weight of the train and its load and varying degrees of perfection and efficiency of equipment are wholly disregarded. To the comparatively short and light passenger train is attributed the same use and the same upkeep cost of the track structure as to the long and heavy freight train. It is urged with much insistence that these differences are leveled by the greater perfection and efficiency of equipment and roadbed and track structure required for the higher speed of the passenger train and for the protection, comfort and safety of passengers. There is much to be said in favor of the employment of this basis of division, and, upon the whole record, as against those advanced by defendants, its use is supported and sustained by the greater weight of the evidence. But a careful review of the whole situation, including the number of trains moved, the number, size and character of the engines, cars and other equipment employed, the number of employes, the wages paid and the volume of traffic in each service, leads at least to serious doubt whether the employment of the Modified Revenue Train Mile method does not accord and assign somewhat too great a proportion of the common property and common expense to the passenger business.

Defendants have proposed two methods or bases of division of unallocated common property and expense, the preferred and primary one being what is termed the Gross Ton Mile ratio. Here one ton one mile is the common unit for all purposes of comparison. Weight and distances are the sole elements considered. All others are disregarded. Assuming, as defendants contend, that wear and strain upon the track structures are not increased by the higher speed of passenger trains, and, further, that plaintiff's roadbed and superstructure are not maintained at a higher degree of perfection and efficiency than is required for the freight traffic thereon, still two vital defects in the Gross Ton Mile theory are plainly evident. The first is that, in measuring use and expense, the carriage of a ton of human beings is treated exactly like the carriage of a ton of coal or iron ore. The second is the fallacy that, the more defective and ineffcient the tools and equipment, the greater the use of the property to and upon which they are applied. Passengers are not transported by weight and the more perfect and efficient the tools and equipment the larger their use and the use of that to which they are applied. In the transportation of passengers and freight, no comparable common ton unit exists. Wear is not always a true measure of use. The greater wear and strain caused by the flat wheels of a box car do not indicate a larger use of the steel rails of the track, but the exact reverse. As regards the division of common expense accounts, this method ignores all causes of cost of upkeep other than wear and strain. In fact, the larger proportion of the expense of the maintenance of way and structures is caused by weather or action of the elements. Ties, ballast, grading, ditches, bridges and even rails, deteriorate and must be repaired and replaced whether they are used or not used for

train operations. The life of a tie is not much longer when in use than when not in use. Any theory which wholly disregards such important elements of expense must be rejected.

The other and secondary method of division proposed by defendants is called the Time Ratio. This factor has been used in dividing property values of right of way, track structures, telegraph
370 and telephone lines and station buildings and fixtures, and also in dividing a few expense accounts, such as maintenance of bridges, trestles and culverts, grade crossings, fences, cattle guards and signs and removal of snow and ice. Here time of train movement is the unit used for all purposes of comparison. Distance, weight and kind are entirely ignored. Of this method it is sufficient to say that neither passengers nor freight are transported upon the basis of the time consumed in their travel. A passenger pays a fixed amount per mile of travel regardless of the time required for his journey. Likewise a ton or a carload of freight. In a strict and accurate sense, the entire railroad property is at all times jointly used and employed in both freight and passenger service. Hence the time of movement of a particular train, or of all trains, bears no relation, direct or indirect, to the use of the property as a whole.

The basis of division suggested by plaintiff, in case the ratio proposed by itself, for any reason, should be rejected, is the one adopted, after careful consideration of many others, by the Interstate Commerce Commission in the Western Passenger Fares Case, 37 I. C. C. Rep. 1-22-23, where it was said: "The fuel consumed by road locomotives drawing trains over the road; the lubricants, water, and other supplies for these locomotives; the train supplies; the wages of trainmen and enginemen, are all separated between passenger and freight, and each by itself or the aggregate of all will constitute an index of the utilization of the tracks by these two branches of the service." In the Arkansas Rate Case (Rowland vs. Boyle, 244 U. S. 106), this method of division was referred to, if not with approval, certainly without criticism, by the Supreme Court. It gives to freight a considerably larger and to passenger a correspondingly smaller percentage of property and expense than is done by plaintiff's assignment, and thereby dissolves and removes whatever doubt may have existed as to the correctness of the ultimate results reached by the application of the Revenue Train Mile ratio.

The percentages by this method of assignment to passenger service, compared with the percentages used by the Master for the years 1912 and 1913, and by plaintiff, for the four year period from 1914 to 1917 inclusive, are as follows:

Year.	I. C. C. ratio.	Modified revenue train-mile ratio.
1912	36.24%	42.36%
1913	34.80%	41.91%
1914	37.62%	45.09%
1915	41.21%	48.65%
1916	37.36%	44.63%
1917	33.93%	42.21%

At the request and under the direction and supervision of the Court, expert accountants, (one from each side by agreement) have made careful, accurate and detailed computations in which the lesser percentages above stated have been applied, first, to defendants' lowest common property values, wherever time or gross weight percentages have been employed, and, second, to the common operating expense accounts, wherever the modified revenue train mile percentage had been employed, and also to the unallocated portions of the transportation expense accounts: Dispatching Trains, Station Employes and Station Supplies. The necessary changes have been made in all overhead accounts. Defendants' estimates of the values of the railroad property have been accepted. There is no dispute con-
371 cerning the revenue or the totals of operating expenses. The difference between the parties in the divisions of the expense accounts, not separated, according to the new and substituted percentages, are too small materially to affect the results and, hence, plaintiff's divisions of these remaining accounts have been accepted. Taxes have been apportioned to passenger and freight upon the basis of the total value of property in each service. The profits derived from mail and express business have been included in the passenger revenues, while the loss incurred in one year has been excluded. The total passenger property has been divided between interstate and intrastate business upon the basis of the passenger miles of transportation in each service. The estimated loss which would have resulted from the application of the two cent rate to plaintiff's passenger business, computed in the manner hereinbefore stated, has been deducted from the net income under the three cent rate. The final net results of these computations for the six years, 1912 to 1917 inclusive, are as follows:

1912.	Total.	Intra.	Inter.
Value of Passenger Property.....	$2,882,375	$1,834,055	$1,048,320
Net Income under Two-cent Rate.....	100,875	78,609	22,266
Rate of Return.....	3.500%	4.286%	2.124%
1913.	**Total.**	**Intra.**	**Inter.**
Value of Passenger Property.....	$2,793,523	$1,831,992	$961,531
Net Income under Two-cent Rate.....	72,892	55,339	17,553
Rate of Return.....	2.61%	3.02%	1.83%
1914.	**Total.**	**Intra.**	**Inter.**
Value of Passenger Property.....	$3,081,623	$1,993,453	$1,088,095
Net Income under Two-cent Rate.....	91,191	61,808	29,383
Rate of Return.....	2.96%	3.10%	2.70%
1915.	**Total.**	**Intra.**	**Inter.**
Value of Passenger Property.....	$3,327,343	$2,338,789	$988,554
Net Income under Two-cent Rate.....	Loss 8,007	Loss 5,527	Loss 2,480
Rate of Return.....	0.0%	0.0%	0.0%

1916.	Total.	Intra.	Inter.
Value of Passenger Property.....	$3,073,670	$2,176,466	$897,204
Net Income under Two-cent Rate.....	42,219	25,832	16,387
Rate of Return.....	1.37%	1.19%	1.83%

1917.	Total.	Intra.	Inter.
Value of Passenger Property.....	$2,889,648	$2,042,114	$847,534
Net Income under Two-cent Rate.....	37,957	20,023	17,934
Rate of Return.....	1.31%	.98%	2.12%

372 Averages for Six Years, 1912 to 1917.

	Total.	Intra.	Inter.
Value of Passenger Property.....	$3,009,685	$2,037,812	$971,873
Net Income under Two-cent Rate.....	56,188	39,347	16,841
Rate of Return.....	1.87%	1.93%	1.73%

Averages for Four Years, 1914 to 1917.

	Total.	Intra.	Inter.
Value of Passenger Property.....	$3,003,052	$2,137,705	$955,347
Net Income under Two-cent Rate.....	40,840	25,534	15,306
Rate of Return.....	1.32%	1.20%	1.60%

It is apparent that, if, in the foregoing computations, actual and fair values of property, instead of defendants' lowest estimates, had been used, and mail and express transportation had been treated as a by-product and credited with its own profits, (as strict accuracy required) the results would have shown a rate of return in intrastate passenger business of no more than 2 per cent during the first three years and a loss in each of the last three years.

For the purpose of further comparison and demonstration, but with some patent inconsistency, another ratio has been obtained by adding to the road accounts used by the Interstate Commerce Commission the corresponding yard expense accounts of the fuel consumed by yard Locomotives: the lubricants, water and other supplies for these locomotives; the yard supplies; and the wages of yard conductors, brakemen and enginemen. These yard accounts are nearly all freight expense and consequently their addition to the road accounts further reduce the percentages of passenger property and expense assignment. The percentages so obtained are 31.17% for 1912; 30.42% for 1913; 33.00% for 1914; 36.17% for 1915; 31.95% for 1916; and 29.35% for 1917. The substitution of these reduced percentages and their application, in the manner above stated, yield the following results:

1912.	Total.	Intra.	Inter.
Value of Passenger Property.....	$2,569,461	$1,634,948	$934,513
Net Income under Two-cent Rate.....	131,893	99,152	32,741
Rate of Return.....	5.133%	6.065%	3.504%

1913.	Total.	Intra.	Inter.
Value of Passenger Property.....	$2,523,159	$1,654,688	$868,471
Net Income under Two-cent Rate.....	105,107	77,204	27,903
Rate of Return.....	4.17%	4.67%	3.21%

1914.	Total.	Intra.	Inter.
Value of Passenger Property.....	$2,788,674	$1,803,993	$984,681
Net Income under Two-cent Rate.....	128,435	86,685	41,750
Rate of Return.....	4.61%	4.81%	4.24%

373

1915.	Total.	Intra.	Inter.
Value of Passenger Property.....	$3,006,345	$2,113,160	$893,185
Net Income under Two-cent Rate.....	23,769	17,513	6,256
Rate of Return.....	.79%	.81%	.70%

1916.	Total.	Intra.	Inter.
Value of Pasenger Property.....	$2,727,368	$1,931,249	$796,119
Net Income under Two-cent Rate.....	76,437	50,807	25,630
Rate of Return.....	2.80%	2.63%	3.22%

1917.	Total.	Intra.	Inter.
Value of Passenger Property.....	$2,589,175	$1,829,770	$759,405
Net Income under Two-cent Rate.....	62,672	38,243	24,429
Rate of Return.....	2.42%	2.10%	3.22%

Averages for Six Years, 1912 to 1917.

	Total.	Intra.	Inter.
Value of Passenger Property.....	$2,700,697	$1,827,968	$872,729
Net Income under Two-cent Rate.....	88,052	61,601	26,451
Rate of Return.....	3.26%	3.37%	3.20%

Averages for Four Years, 1914 to 1917.

	Total.	Intra.	Inter.
Value of Passenger Property.....	$2,777,890	$1,919,543	$858,347
Net Income under Two-cent Rate.....	72,828	48,312	24,516
Rate of Return.....	2.62%	2.52%	2.86%

These figures demonstrate conclusively that, upon any reasonable hypothesis, during the last six years, and particularly during the more important period of the last four years, plaintiff would not

have received, under a two cent rate, an adequate return from its intrastate passenger business. This conclusion accords with and is confirmed by many known facts. The passenger travel upon this railroad is comparatively light and very much less than that upon roads of the same class traversing sparsely settled portions of the Lower Peninsula of Michigan. Climatic conditions are extremely unfavorable. No large cities are served, either along the line of road or at terminals. Distances between even small centers of population are great. Agricultural development is small. The situation and conditions shown by this record are quite similar to those of the Minneapolis and St. Louis Railroad Company, described in the Minnesota Rate Cases, where the Supreme Court, notwithstanding erroneous methods of computation and apportionment, declared the statutory rate to be confiscatory. In the Arkansas Rate Case, where the rate of return was little, if any, larger than here, the same Court sustained the contentions of the railroad company. It is settled by experience and by authority that the cost per mile of the transportation of the intrastate passenger is more than that of the inter-
374–5 state, and yet, in the Western Passenger Fares Case, the Interstate Commerce Commission granted to this plaintiff, and to other railroads much more favorably situated, the right to charge two and four tenths cents per mile for interstate transportation. Plaintiff has never paid a dividend upon its stock and, from its income, has never been able to pay more than a small portion of the interest upon its bonded indebtedness. There is no charge of mismanagement in recent years. Operating expenses have steadily increased and are likely to continue to increase for some time to come.

Plaintiff is entitled to a decree in its favor. The precise form thereof will be settled after hearing counsel for both parties. At the time of the settlement of the decree, the effect of the recent action of the Government in taking over the control and operation of the railroads of the country, including this one, upon the extent and scope of the relief by injunction which should be granted, will be considered and determined.

C. W. SESSIONS,
District Judge, Sitting by Designation.

Dated, January 8, 1918.

Filed in Clerk's office, January 9, 1918.
ELMER W. VOORHEIS, *Clerk.*

376 20.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff,

vs.

CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, ADDISON A. KEISER, Alex. J. Groesbeck, Morgan W. Jopling, John R. Van Evera, and Fred S. Case, Defendants.

Final Decree.

It appearing to the Court that the report of Herbert L. Baker, Esq., Special Master heretofore appointed herein, which was filed on February 1st, 1917, was based upon testimony which related to the valuation of plaintiff's property used in its passenger business in the State of Michigan, and the results of the operations of the Plaintiff Company's business solely for the fiscal years 1910, 1911, 1912, and 1913, ending June 30th of each year, the Court held the same insufficient as a basis for an adjudication of all the issues involved in this case, for the reason that to properly adjudicate the issues herein, it was necessary that testimony covering the valuation of said property and the operations of the plaintiff company during the fiscal years which had intervened between 1913 and the final hearing, should be presented and considered by the Court.

The Court thereupon directed the parties to prepare and present testimony covering the valuation of said property and the operations of the plaintiff company during such intervening fiscal years,
377 and directed that the same should be presented in open Court.

Thereafter, in accordance with such direction, testimony of respective parties covering the valuation of said property and the results of the operations of the company during said intervening fiscal years, to-wit: 1914, 1915, 1916, 1917, was presented to the Court. And the case was submitted to the Court upon the testimony introduced before the Master, and by him returned to the Court, together with the testimony introduced in open Court as aforesaid, and the arguments of Counsel. And the Court having considered the same,

It is thereupon ordered, adjudged and decreed as follows:

1. That the Act of the Legislature of the State of Michigan complained of in this suit, being Act Number 276 of the Public Acts of the State of Michigan for the year 1911, was, at the time when it was enacted and approved, and became effective so far as the same affected the plaintiff company, repugnant to, and violative of the Constitution of the United States, forasmuch as by the provisions thereof, the plaintiff railway company could not exact for the transportation of passengers from one point to another within the State of Michigan, charges which would yield to said company reasonable compensation for such services. That ever since the said act became effective, the said act has been and now is, so far as it relates to the plaintiff company, repugnant to, and violative of the Constitution of the United States, forasmuch as by the provisions of said act, the said plaintiff

railway company could not exact for the transportation of pas-
378 sengers from one point to another within the State of Michigan, charges which would yield to said company reasonable compensation for such services; and the said act so far as it relates to the plaintiff company, was, at the time it became effective and ever since has been and now is void and of no force.

2. That the said Cassius L. Glasgow, Charles S. Cunninghom, and Addison A. Keiser, constituting the Railroad Commission of the State of Michigan and their successors in office, be and each of them is hereby permanently enjoined and restrained from taking any steps or instituting any proceedings for the enforcement of the said act against said plaintiff company or its officers or representatives, and from entertaining, hearing or determining any complaint against the plaintiff company for or on account of any act or thing by it, its officers, servants, agents, or employees done, suffered or omitted, which may be forbidden or commanded by said legislative act; and from instituting or prosecuting or causing to be instituted or prosecuted any action or proceeding, civil or criminal against the plaintiff company or its officers or representatives, for any act or thing done, suffered or omitted, which may be forbidden or commanded by said act; and said defendant Alex. J. Groesbeck, Attorney General of the State of Michigan be and he hereby is in like manner enjoined from bringing or causing to be brought or prosecuted, any proceeding by way of injunction, mandamus, civil action or indictment against said company or its officers, on account of any action or omission on the part of the plaintiff company commanded or forbidden by the said legislative act.

379 3. That the said defendants Morgan W. Jopling, John R. Van Evera and Fred S. Case, and all other persons making use of plaintiff's line of railway, be and they are and each of them hereby is permanently enjoined and restrained from instituting or causing to be instituted any action or proceeding to collect from plaintiff company, damages or penalties for any violation by the plaintiff company of the said act.

4. That neither party recover costs herein.

5. It is further ordered that the order of this court, dated the 26th day of September, 1911, requiring the plaintiff, during the pendency of this suit, to issue to all persons travelling intrastate on its road, refund coupons agreeing to refund to the holder of the same an amount equal to the difference between the rate of fare charged such passenger for transportation and the rate prescribed in the act complained of, is hereby set aside and annulled and said coupons are adjudged to be of no validity or value, and the bond provided to be given and given by said plaintiff for the redemption of said coupons is hereby discharged; and the order heretofore entered on the 22nd day of October, 1915, directing the plaintiff to set aside a special bank deposit for the redemption of said coupons is also set aside and annulled, and the banks in which deposits of funds have been made by the plaintiff in accordance with said order are hereby ordered to pay over to the plaintiff at its request all sums of money deposited by the plaintiff in said banks, or the securities representing the same, if any of the said

moneys have been invested under the orders of this court, and all said moneys and the securities representing the same, if invested,
380 are hereby freed from any trust imposed upon them by said order.

Provided, however, in order that the rights of all parties may be protected and the status quo preserved during a review of this cause upon appeal, if such appeal is desired, the operation of this section (section 5) of this decree is hereby suspended for a period of twenty days from the date of entry hereof to permit an appeal by the defendants, and if such appeal is within said time duly allowed, such operation of said section is further suspended for and during the pendency of such appeal until the final determination thereof, during which time said orders shall continue in full force, except as herein modified. And it is decreed that if defendants appeal herein as hereinabove mentioned, then pending the determination of this case upon such appeal the plaintiff shall comply with said order to the extent of issuing and delivering coupons as therein provided; but from the date hereof plaintiff will not be required to make any special or other deposit for the redemption of said coupons. But the bond heretofore given under said order and the special deposits heretofore made under said order shall stand as security as well for the redemption of the coupons heretofore issued under said order, as the coupons which may hereafter be issued as hereinabove provided.

6. It is further ordered, adjudged and decreed that the defendants herein, members of the Railroad Commission of the State of Michigan, or the Attorney General may hereafter, when the circumstances have changed so that the rates fixed in the said act shall yield to the said plaintiff company reasonable compensation for the serv-
381 ices aforesaid, apply to this Court by supplemental bill or otherwise, as they may be advised, for a further order in that behalf.

7. Provided further, that nothing herein contained shall in any manner be construed as in any manner affecting or as a limitation upon or interference with the control, regulation, or fixing of rates for said railroad by the Federal Government or any agency thereof.

Dated this 13th day of February, 1918.

Approved for entry: C. W. SESSIONS,
District Judge, Sitting by Designation.

Filed Feby. 14, 1918.
ELMER W. VOORHEIS, *Clerk.*

382 DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff,

vs.

CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, ADDISON A. KEISER, Alex. J. Groesbeck, Morgan W. Jopling, John R. Van Evera, and Fred S. Case, Defendants.

The matter of application for allowance of Master's compensation in the above entitled matter having come on to be heard, the Court

hereby fixes such compensation at $14,000; one-half of any balance yet remaining unpaid to be paid by each party respectively. And that the defendants pay in addition $25.40 expenses incurred by the Master in traveling to take testimony of witnesses produced by the defendants at Chicago.

Dated this 13th day of February, 1918.

C. W. SESSIONS,
District Judge, Sitting by Designation.

Filed Feb. 14, '18.
ELMER W. VOORHEIS, *Clerk.*

383 DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff,

vs.

CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, ADDISON A. KEISER, Alex. J. Groesbeck, Morgan W. Jopling, John R. Van Evera, and Fred S. Case, Defendants.

It appearing to the Court that Lawton T. Hemans one of the defendants and member of the Michigan Railroad Commission is deceased and that Addison A. Keiser of Ludington, Michigan has succeeded said Hemans as a member of said Railroad Commission; and it also appearing that the defendant Grant Fellows has been succeeded in the office of Attorney General for the State of Michigan by Alex J. Groesbeck of Detroit, Michigan; now, therefore, by agreement of the parties had in open Court it is ordered that the said Addison A. Keiser as a member of said Michigan Railroad Commission and Alex J. Groesbeck as Attorney General of the State of Michigan, be and they are hereby substituted as defendants in the above cause in place of said Lawton T. Hemans, deceased, and Grant Fellows as attorney general; and the said substituted defendants having entered their respective appearances in this cause as defendants, through their solicitor Alex J. Groesbeck, Attorney General of the State of Michigan, it is further ordered, by consent of the parties, that the pleadings heretofore filed in the above entitled cause for and on be-
384 half of the defendants, stand as the pleadings for the said substituted defendants.

Dated this 13th day of February, 1918.

C. W. SESSIONS,
District Judge, Sitting by Designation.

Feby. 14, '18.
ELMER W. VOORHEIS, *Clerk.*

385 21.

Petition for and Allowance of Appeal and Assignment of Errors.

United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

v.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, Morgan W. Jopling, John R. Van Evera, and Fred S. Case, Defendants and Appellants.

On this 5th day of March, 1918, at 11 o'clock A. M. the above named defendants, Alex J. Groesbeck, Cassius L. Glasgow, Charles S. Cunningham and Addison A. Keiser, presented to the Court in open session a petition asking for the allowance of an appeal to the Supreme Court of the United States from the final judgment and decree entered in said action in this Court on the 13th day of February, 1918, and a severance of the other defendants and permission to appeal without joining such other defendants.

It was made to appear that notices of the presentation of this application, at this time and place, had been duly served upon all the other defendants, namely, Morgan W. Jopling, John R. Van Evera and Fred S. Case. Roger I. Wykes appeared as counsel for the petitioning defendants, and none of the other parties plaintiff or defendant appeared.

Upon reading and filing the said petition for appeal, it is ordered that said appeal be, and the same is hereby permitted to the parties requesting the same, without the other defendants joining, and the said appeal is hereby allowed to the said defendants Groesbeck, Glasgow, Cunningham and Keiser as prayed in said petition, without the giving of bond, the giving of a bond having been waived by plaintiff in open court.

C. W. SESSIONS,
District Judge, Sitting by Designation.

386 United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, Morgan W. Jopling, John R. Van Evera, and Fred S. Case, Defendants and Appellants.

Now come the above-named defendants, Alex. J. Groesbeck, Cassius L. Glasgow, Charles S. Cunningham and Addison A. Keiser, who feeling aggrieved by the decree rendered and entered in the above entitled cause on the 13th day of February, 1918, desire to appeal therefrom.

These defendants show that they heretofore demanded of the other defendants (Mr. Morgan W. Jolping, John Van Evera, and Fred S. Case) named in said cause, that they join in this appeal, and duly notified each of said other defendants of the time and place where this petition would be presented, as more fully appears from the original notice and proof of service thereof, which are hereto attached and herewith presented to and filed in this Court.

Therefore, these defendants hereby appeal from the said decree to the Supreme Court of the United States for the reasons set forth in the Assignment of Errors, filed herewith, and they pray (*a*) that this appeal by them, separately from and without other defendants joining therein, be allowed, (*b*) that citation be issued as provided by law, (*c*) and that a transcript of the records, proceedings and documents upon which said decree is based, duly authenticated, be sent to the Supreme Court of the United States, sitting at
387 Washington, D. C., under and in accordance with the statutes and the rules of such Court in such case made and provided.

ALEX. J. GROESBECK,
CHARLES S. CUNNINGHAM,
CASSIUS L. GLASGOW,
ADDISON A. KEISER,
By ALEX. J. GROESBECK,
Attorney General.

LELAND W. CARR,
ROGER I. WYKES,
Attorneys for Defendants and Appellants.

Dated this 1st day of March, 1918.

Filed March 6th, 1918.
ELMER W. VOORHEIS, *Clerk.*

388 United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, Morgan W. Jopling, John R. Van Evera, and Fred S. Case, Defendants and Appellants.

To Morgan W. Jopling, John R. Van Evera, and Fred S. Case:

You, and each of you, being named as defendants in the above entitled cause, are hereby notified that we, Alex. J. Groesbeck, Cassius L. Glasgow, Charles S. Cunningham and Addison A. Keiser, who are also defendants therein, propose to appeal to the Supreme Court of the United States from the judgment and decree of the above-named District Court entered therein on February 13, 1918, and that we will, on the 5th day of March, 1918, at 11 o'clock A. M., present to the Hon. Clarence W. Sessions, District Judge, at the District Court room in the Federal Building in the City of Grand Rapids, Michigan, our petition to have said appeal allowed.

And the above-named Alex. J. Groesbeck, Cassius L. Glasgow, Charles S. Cunningham and Addison A. Keiser, hereby request and demand that you, and each of you, join with them in the taking of said appeal to the Supreme Court.

Very respectfully,

ALEX. J. GROESBECK,
CASSIUS L. GLASGOW,
CHARLES S. CUNNINGHAM,
ADDISON A. KEISER,
By ALEX J. GROESBECK &
ROGER I. WYKES,
Their Attorneys.

389 I hereby acknowledge due and timely service of the within notice on March 1st, 1918.

(Signed) JOHN R. VAN EVERA.

390 STATE OF MICHIGAN,
County of Marquette, ss:

Moritz H. Fahlstedt, being duly sworn, deposes and says that he served a true copy of the within notice upon Fred S. Case, by hand-

ing a copy of the same to him personally, in the City of Sault Ste. Marie, on the 1st day of March, 1918.

(Signed) MAURITZ H. FAHLSTEDT.

[SEAL.] (Signed) G. A. CARLSON,
Notary Public,
Marquette County, Michigan.

My Commission expires April 17th, 1920.

STATE OF MICHIGAN,
County of Marquette, ss:

Mrs. Mauritz H. Fahlstedt, being duly sworn, deposes and says that -he served a true copy of the within notice upon John R. Van Evera, by handing a copy of the same to him personally, in the City of Marquette, on the 1st day of March, 1918.

(Signed) MRS. MAURITZ H. FAHLSTEDT.

[SEAL.] (Signed) J. F. HORNGREEN,
Notary Public,
Marquette County, Michigan.

My Commission expires August 6, 1919.

STATE OF MICHIGAN,
County of Marquette, ss:

Mauritz H. Fahlstedt, being duly sworn, deposes and says that he served a true copy of the within notice upon Morgan W. Jopling, of Marquette, Michigan, by leaving the same at his residence at 505 E. Ridge St., in the City of Marquette, on the 2nd day of March, 1918, with Miss Tillie Leskie, an adult person in charge of such residence, the said Morgan W. Jopling being absent from said City.

(Signed) MAURITZ H. FAHLSTEDT.

[SEAL.] (Signed) G. A. CARLSON,
Notary Public,
Marquette County, Michigan.

My Commission expires Apr. 17, 1920.

Filed March 6th, 1918.
ELMER W. VOORHEIS, *Clerk.*

391 United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

v.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, Morgan W. Jopling, John R. Van Evera, and Fred S. Case, Defendants and Appellants.

COUNTY OF KENT, *ss:*

Roger I. Wykes being duly sworn deposes and says that he has communicated by telegraph with each of the defendants, John R. Van Evera, Fred S. Case and Morgan W. Jopling, and that each of said defendants has refused to join in the appeal now being taken.

ROGER I. WYKES.

Subscribed and sworn to before me this 5th day of March, 1918.

GEO. B. KINGSTON,
Notary Public, Kent County, Mich.

My commission expires May 28, 1919.

Filed March 6th, 1918.
ELMER W. VOORHEIS, *Clerk.*

392 United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser et al., Defendants and Appellants.

To A. B. Eldredge, attorney for plaintiff:

Please to take notice that we will, on behalf of the above-named defendants, apply to the Hon. Clarence W. Sessions, District Judge, at the Federal Court room, in the City of Grand Rapids, at eleven o'clock A. M., on the 5th day of March, 1918, for an order allowing an appeal to the Supreme Court from the decree entered in said cause on the 13th day of February, 1918, and that we will, on behalf of

the above-named defendants, then and there request severance and permission to appeal without joining such of the other defendants therein as do not appear and join in said appeal.

(Signed) ALEX. J. GROESBECK,
Attorney General.

(Signed) ROGER I. WYKES,
Of Counsel.

Dated February 27, 1918.

Filed March 6th, 1918.
ELMER W. VOORHEIS, *Clerk.*

393 STATE OF MICHIGAN,
County of Marquette, ss:

This 2nd day of March, personally appeared before me, Mauritz H. Fahlstadt, who, being duly sworn, deposes and says that he served the within notice on A. B. Eldredge, by handing the same to him personally, in the City of Marquette, on the 2nd day of March, 1918.

(Signed) MAURITZ H. FAHLSTEDT.

[NOTARIAL SEAL.] (Signed) G. A. CARLSON,
Notary Public,
Marquette County, Michigan.

My Commission expires April 17th, 1920.

Filed March 6th, 1918.
ELMER W. VOORHEIS, *Clerk.*

394 United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, ADDISON A. KEISER, Alex. J. Groesbeck, Morgan W. Jopling, John R. Van Evera, and Fred S. Case, Defendants and Appellants.

Now come the said defendants in the above entitled cause, and make and file this, their Assignment of Errors, upon which they will rely upon their prosecution of their appeal from the decree rendered therein by the said Court on February 13, 1918.

(1) That the said Court erred, in refusing to dismiss the Bill of Complaint in said cause, for the reason that the passenger rates therein complained of and fixed in Act 276 of the Public Acts of

Michigan of 1911 were and are, as applied to the said plaintiff, reasonable, sufficient and compensatory.

(2) That the said Court erred, in decreeing said Act 276 of the Public Acts of Michigan of 1911, and the passenger rates therein fixed, to be unreasonable, insufficient and uncompensatory, and in, therefore, restraining the enforcement and operation of said statute and rates as applied to the said plaintiff.

(3) That the said Court erred, in refusing to determine that the plaintiff had not made out a case entitling it to relief by
395 injunction and had not overcome the presumptions which exist in favor of the validity of a rate-fixing statute, and to dismiss the bill accordingly.

(4) That the said Court erred, in not making more specific findings and determinations as to the values of the property of the plaintiff in the aggregate, and in not finding and determining the value of the property engaged in each of the several services performed by the plaintiff.

(5) That the said Court erred, in not limiting the value of the property of the plaintiff used in its business, and required to be supported by the rates fixed by law, to the amount of the original investment therein.

(6) That the said Court erred, in using a value for the property of the plaintiff arrived at upon a so-called cost-of-reproduction theory or method, and not representing its fair present value for any of the years in controversy.

(7) That the said Court erred, in its determination, that the value of the plaintiff's property, and of the individual items thereof, was, for the years 1912 to 1917 inclusive, or for any of such years, greater than the value claimed by the defendants for the said property or for its individual items.

(8) It is claimed that the values of the several items or schedules constituting the inventory and value of the plaintiff's property were not greater than the amounts claimed as the value by the defendants, and that the Court erred wherever it selected, included or used a greater value and amount for the item or schedule than that claimed by the defendants.

396 (9) That the said Court erred, in determining and using excessive amounts and values for the property of the plaintiff used in its intrastate passenger business in Michigan for each of the years, 1912 to 1917 inclusive.

(10) That the said Court erred, in the use of an arbitrary and incorrect basis for the separation of the property of the plaintiff commonly used in its passenger and freight businesses between such businesses, and that too great an amount or value of such property was, due to the erroneous methods used, attributed to, and required to be supported by, the intrastate passenger business, and rates fixed by he statute complained of, in Michigan.

(11) That the said Court erred, in not limiting the property of the plaintiff required to be supported by its intrastate passenger business in Michigan to the proper proportion of the property actually used in that business, and in refusing to set off and to deduct a proper

proportion of the property of the plaintiff, as used in auxiliary services, such as sleeper, diner and mail and express services.

(12) That the said Court erred, in that it found and determined that the net income of the plaintiff from its intrastate passenger business was less than it in fact is or was during the years in controversy, or any of them, and less than it would have been with the statutory rates complained of in operation.

(13) That the said Court erred, in the methods used, and in the results reached, in determining the expenses arising upon, incident to, caused by, and properly attributable to, the passenger business of the plaintiff in Michigan, and particularly upon, by and to the intrastate passenger business.

397 (14) That the said Court erred, in not requiring the division of expenses between the respective services upon the plaintiff's line for the years in controversy, and each of them, to be based upon accounts and records kept by the plaintiff for the purpose of showing the cost of, and expenses properly chargeable to, each class of the service.

(15) That the said Court erred, in dividing the plaintiff's operating expenses between services, as between the freight and passenger services and between the intrastate and interstate passenger services, upon arbitrary and hypothetical formulæ or ratios, which depended solely upon opinion, which did not represent the facts, and the propriety for which was unsupported by any facts, circumstances or proofs in the cause.

(16) That the said Court erred, in attributing too great an amount of the expenses of operation to the plaintiff's passenger business in Michigan and an insufficient amount of the expenses to its freight business.

(17) That the said Court erred, in refusing and neglecting to set off to the freight service, and to thus deduct from the common expenses, a part of which were attributed to the intrastate passenger service, expenses properly attributable to the maintenance of exclusive freight trackage, thus unduly burdening the plaintiff's intrastate passenger expenses.

(18) That the said Court erred, in its methods and results, in dividing the Michigan expenses common to the plaintiff's passenger and freight businesses between such services, with the effect that a larger proportion of such common expenses was attributed to the intrastate passenger business of the plaintiff in Michigan than was properly attributable thereto or than actually arose thereon, or than was in fact caused thereby.

398 (19) That the said Court erred, in determining that the so-called "direct train cost" ratio, as ascertained and used by him, for the division of common expenses of the line of the plaintiff between its passenger and freight services, fairly or properly divided such common expenses between such services, or fairly represented the causes of such expenses, or the effects of use, or the expenses in or by the respective services.

(20) That the said Court erred, in refusing to determine that the gross ton mile ratio would more properly divide expenses of the plain-

tiff common to its freight and passenger services between those services than the ratio for such division which he used, namely, the directly-charged train costs in the respective services.

(21) That the said Court erred, in burdening the intrastate passenger operations and business of the plaintiff with the expenses and operations of other businesses, such as sleeper, diner, etc., and in not requiring each business to stand upon its own bottom and to bear its own expenses and costs, thus attributing too great an amount and proportion of expense to the intrastate passenger business of the plaintiff in Michigan.

(22) That the said Court erred, in including in the intrastate passenger business, and requiring that business and the rates therefrom to support, operations and services not a part thereof, and expenses and outlays not properly attributable thereto, by reason of not setting out and excluding expenses arising in the operations over the Mineral Range Railroad, in the operation of sleeper and diner services, in the operation of the mail and express service, and in the operation of the Mackinaw Transportation Company.

(23) That the said Court erred, in attributing too great an amount of the plaintiff's passenger expenses to its intrastate passenger
399 business in Michigan and too small an amount to its interstate passenger business.

(24) That the said Court erred, in its division of expenses between the intrastate and interstate passenger businesses, in refusing to divide that portion of the passenger expenses attributable to the business carried, or to passengers riding, in sleepers on the basis of the respective actual operations therein, as indicated by the number of passengers traveling interstate and intrastate therein, or upon some other equally proper basis.

(25) That the said Court erred, in refusing to recognize that the interstate passenger business and operations upon the plaintiff's line are largely responsible for the sleeper business and the losses therein, and that a larger part, therefore, of the sleeper business should have been assigned to the interstate passenger service.

(26) That the said Court erred, in failing and refusing to separate the operations of the plaintiff over its Western Division from the operations of the remainder of its line, thereby permitting the operations of that division to have the effect of indicating a lesser return from the intrastate passenger operations of the plaintiff than actually existed thereon.

(27) That the said Court erred, in holding that the loss or deficiency of earnings on plaintiff's line in Michigan, if any would exist with the statutory rate in operation, would be due, in whole or in part, to the intrastate passenger business, whereas such deficiency or loss, if it existed, would in fact be due to the interstate business and operations of the plaintiff, and not to the intrastate passenger business.

400 (28) That the said Court erred, in refusing, in lieu of restraining the operation of said Act 276 of the Public Acts of Michigan of 1911 and the rates therein fixed, to require the plaintiff to put such rates into effect, for the purpose of determining the actual

result of operations under the rates, and whether the claimed loss in revenue due to the decreased rates would in fact result.

(29) That the said Court erred, in assuming and deducting a mathematically-computed loss equal to the difference between the rates in force and the rates fixed upon a two-cent basis as required by law, and in allowing any loss in the absence of proof thereof and in the absence of an experimental operation of the reduced rate to determine whether its effect in operation would be to increase traffic.

(30) That the said Court erred, in refusing to hold the said plaintiff estopped to question the validity of said Act 276 of the Public Acts of Michigan of 1911, and of the rates therein fixed, by reason of the acceptances, by itself and its predecessors, of land grants with conditions attached thereto as indicated by the statutes of the State of Michigan and the Record in this cause.

(31) That each of the several assignments of error hereinbefore made and set forth is intended to apply equally to each and all of the years from 1912 to 1917, both inclusive.

Wherefore, the defendants and appellants pray that said decree be reversed, and that the said District Court for the Eastern District of Michigan be ordered to enter a decree reversing the decision of the lower court in said cause.

ALEX. J. GROESBECK,
Attorney General;
ROGER I. WYKES,
LELAND W. CARR,
Attorneys for Appellants.

Filed March 6th, 1918.
ELMER W. VOORHEIS, *Clerk.*

401

22.

Citation and Acceptance of Service.

United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, Morgan W. Jopling, John R. Van Evera, and Fred S. Case, Defendants.

UNITED STATES OF AMERICA, *ss:*

To the Duluth, South Shore & Atlantic Railway Company, Greeting:

You are hereby cited and admonished to be and appear at the Supreme Court of the United States to be held at the City of Washing-

ton, in the District of Columbia, on the 3rd day of April, A. D. 1918, Pursuant to an order allowing an appeal filed and entered in the Clerk's office of the District Court of the United States for the Eastern District of Michigan, from a final decree, signed, filed and entered on the 13th day of February, 1918, in that certain suit, being Former Circuit Court Case No. 4117, in equity, wherein Alex. J. Groesbeck, Cassius L. Glasgow, Charles S. Cunningham, & Addison A. Keiser, are defendants and appellants and you are plaintiff and appellee, to show cause, if any there be, why the decree rendered against
402 the said defendants and appellants, as in said order allowing appeal mentioned, should not be corrected, and why justice should not be done to the parties in that behalf.

Witness the Honorable Clarence W. Sessions, United States District Judge for the Western District of Michigan, this 5th day of March, 1918.

C. W. SESSIONS,
U. S. District Judge, Sitting by Designation for the Eastern District of Michigan.

On behalf of the plaintiff and appellee, I hereby admit due, proper and timely service, by copy, of the within citation.

A. B. ELDREDGE,
Attorneys for Plaintiff and Appellee.

STATE OF MICHIGAN,
County of Kent, ss:

Roger I. Wykes, being first duly sworn, deposes and says that the annexed citation was served upon the plaintiff and appellee by enclosing and sealing the same in an envelope, properly addressed to the plaintiff's attorney, A. B. Eldredge, at Marquette, Michigan, and depositing the same in the United States mails at Grand Rapids, Michigan with postage fully prepaid thereon, and that the signature of plaintiff's attorney and the signature to acceptance of service on the copy of the original citation is the true, proper and correct signature of said A. B. Eldredge, known by deponent to be such.

(Signed) ROGER I. WYKES.

Subscribed and sworn to before me this 14th day of March, 1918.

(Signed) GEO. B. KINGSTON,
Notary Public, Kent County, Mich.

My commission expires May 28, 1919.

Filed March 18, 1918.
ELMER W. VOORHEIS, *Clerk.*

403 23.

Motion and Order Enlarging Time for Docketing Appeal and Filing Record on Appeal and Second Citation, with Acceptance of Service.

United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, ADDISON A. KEISER, et al., Defendants and Appellants.

Now come the above-named defendants and appellants and move the Court for an order enlarging the time within which they may docket the appeal in said cause and file the record thereof with the Clerk of the United States Supreme Court.

This motion is based on the affidavit of Roger I. Wykes, hereto attached.

ALEX. J. GROESBECK,
ROGER I. WYKES,
Attorneys for Defendants and Appellants.

Dated April 2nd, 1918.

Filed April 4, 1918.
ELMER W. VOORHEIS, *Clerk.*

404 United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, ADDISON A. KEISER, et al., Defendants and Appellants.

STATE OF MICHIGAN,
County of Kent, ss:

Roger I. Wykes, being first duly sworn, deposes and says that he is one of the attorneys for the defendants and appellants in the above entitled cause; that the record in said cause is long and complicated,

there being upwards of ten thousand pages of testimony and several hundred exhibits; that the proper making up of a record for the United States Supreme Court involves examination of all the testimony and exhibits, and the abstracting, condensing and elimination of much testimony and many exhibits; that counsel for the respective parties have been considering the subject of the stipulation concerning the record on appeal; that the time which has elapsed since the appeal was claimed has been altogether too short to permit of the completion and docketing of such record; that, as deponent is informed and believes, not less than three months add-tional time should be granted for the docketing of this cause and the filing of the record therein with the Clerk of the United States Supreme Court.

ROGER I. WYKES,
Attorney for Defendants and Appellants.

Sworn and subscribed to before me this 2nd day of April, 1918.

GUNSON TAGGART,
Notary Public, Kent County, Michigan.

My commission expires May 9, 1919.

Filed April 4, 1918.
ELMER W. VOORHEIS, *Clerk.*

405 United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, ADDISON A. KEISER, et al., Defendants and Appellants.

On this 2nd day of April, 1918, on reading and filing the motion of the defendants and appellants in the above entitled cause, and the affidavit of Roger I. Wykes accompanying the same, it appearing to the Court that there is good cause shown why the time within which such cause should be docketed and the record thereof filed with the Clerk of the United States Supreme Court should be extended and enlarged, and that the time for enlargement of the same has not expired;

It is hereby ordered that the time granted to the defendants and appellants by rule to docket said cause and file the record thereof with the Clerk of the United States Supreme Court, be, and the same is hereby, extended and enlarged for the period of ninety days from the 3rd day of April, 1918.

C. W. SESSIONS,
U. S. District Judge, Sitting by Designation for the Eastern District of Michigan.

Filed April 4, 1918.
ELMER W. VOORHEIS, *Clerk.*

406 United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, et al., Defendants and Appellants.

UNITED STATES OF AMERICA, *ss:*

To the Duluth, South Shore & Atlantic Railway Company, Greeting:

You are hereby cited and admonished to be and appear at the Supreme Court of the United States to be held at the City of Washington, in the District of Columbia, on the first day of May, A. D. 1918, pursuant to an order allowing an appeal filed and entered in the Clerk's office of the District Court of the United States for the Eastern District of Michigan, from a final decree, signed, filed and entered on the 13th day of February, 1918, in that certain suit, being Former Circuit Court Case No. 4117, in equity, wherein Alex J. Groesbeck, Cassius L. Glasgow, Charles S. Cunningham and Addison A. Keiser are defendants and appellants and you are plaintiff and appellee, to show cause, if any there be, why the decree rendered against the said defendants and appellants, as in said order allowing appeal mentioned, should not be corrected, and why justice should not be done to the parties in that behalf.

407 Witness the Honorable Clarence W. Sessions, United States District Judge for the Western District of Michigan, this second day of April, 1918.

C. W. SESSIONS,
U. S. District Judge, Sitting by Designation for the Eastern District of Michigan.

On behalf of the plaintiff and appellee, I hereby admit due, proper and timely service, by copy, of the within citation.

____ ____,
Attorney for Plaintiff and Appellee.

Filed April 4, 1918.
ELMER W. VOORHEIS, *Clerk.*

408 United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, et al., Defendants and Appellants.

STATE OF MICHIGAN,
County of Kent, ss:

Mauritz H. Fahlstedt, being first duly sworn, deposes and says that he served a true copy of the within Motion, Affidavit, Order and Citation upon A. B. Eldredge, President of, and Attorney for, the plaintiff and appellee, by enclosing and sealing the same — an envelope properly addressed to said A. B. Eldredge at Marquette, Michigan, and depositing the same in the United States Mails at Grand Rapids, with postage fully prepaid thereon, this 3rd day of April, 1918.

MAURITZ H. FAHLSTEDT.

Sworn and subscribed to before me this 3rd day of April, 1918.
ABNER D. DILLEY,
Notary Public, Kent Co., Michigan.

My commission expires Aug. 1, 1918.

Filed April 4, 1918.
ELMER W. VOORHEIS, *Clerk.*

409 24.

Motion and Order of September 13, 1918, Extending Time for Docketing Appeal and Returning Record.

United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, et al., Defendants and Appellants.

This matter coming on to be heard upon the motion of counsel for the plaintiff asking that the time allowed said counsel for plaintiff within which to present amendments to the proposed transcript of record on appeal in said cause may be extended to thirty days from September 15, 1918, the plaintiff consenting as a condition to said order that the time within which the defendants may return the record and docket the appeal may be extended for a period of sixty days from September 30, 1918, said motion being based upon the affidavit of John E. Tracy, of counsel for the plaintiff, and upon the telegraphic stipulation of Roger I. Wykes, of counsel for the defendants filed herein:

On motion of John E. Tracy, of counsel for the plaintiff, it is ordered, that the time within which plaintiff may present its amendments to the proposed record on appeal be extended to thirty days from September 15, 1918, and that the time within which the defendants may return the record and docket the appeal in said cause be extended until sixty days from September 30, 1918.

C. W. SESSIONS,
District Judge.

Dated Sept. 13th, 1918.

Filed Sept. 13, 1918.
ELMER W. VOORHEIS, *Clerk.*

410 United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, et al., Defendants and Appellants.

Now comes the plaintiff and moves the Court for an order extending the time within which the plaintiff may present its amendments to the proposed transcript of record on the appeal of said cause to thirty days from the 15th day of September, 1918, the plaintiff consenting as a condition of said order that an additional order may be entered extending the time within which the defendants may return the record and docket the appeal in said cause to sixty days from September 30, 1918.

This motion is based on the affidavit of John E. Tracy hereto attached, and upon the telegraphic stipulation of Roger I. Wykes, of counsel for the defendants in said cause, also hereto attached.

JOHN E. TRACY,
Of Counsel for Plaintiff.

Dated Sept. 10, 1918.

Filed Feby. 13, 1918.
ELMER W. VOORHEIS, *Clerk.*

411 United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, et al., Defendants and Appellants.

STATE OF MICHIGAN,
County of Marquette, ss:

John E. Tracy, being duly sworn, on oath says that he is of counsel for the plaintiff in the above entitled action, having principal charge of said suit since the death of A. B. Eldredge, Attorney of Record for the plaintiff therein; that on the 5th day of September,

1918, plaintiff's attorneys were served by the defendants with a copy of the proposed transcript of record on appeal in said cause and are now engaged in examining the same and preparing proposed amendments thereto; that said record was a very voluminous one, containing 1752 pages, and that the time allowed by the Rule is insufficient within which to properly examine the said proposed record and prepare such amendments; and that a reasonable time within which counsel for plaintiff would be able to examine said proposed record and prepare such amendments would be thirty days from the 15th day of September, 1918.

JOHN E. TRACY.

Subscribed and sworn to before me this 10th day of September, 1918.

LOUISE M. LA VIGNE,
Notary Public in and for said County.

My commission expires Feb. 6, 1921.

Filed Feby. 13, 1918.
ELMER W. VOORHEIS, *Clerk.*

412

Lansing, Mich.,
Sept. 10—1:30 p.

M. E. Lehnen, Secy., Marquette:

In South Shore rate case will stipulate to extend plaintiff's time to present amendments to proposed record for thirty days provided time to return record and docket appeal is also extended sixty days from Sept. thirtieth. Use this telegram making show of cause and secure both extensions on one order.

ROGER I. WYKES.

413

25.

Stipulation re Exhibits, Dated Sept. 16, 1918.

United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, et al., Defendants and Appellants.

In this cause, it is stipulated by the respective parties, through and by their respective counsel, as follows:

(1) As there are two of the plaintiff's exhibits marked with the number 214, it is agreed that the second of those exhibits, being "I. C. C. Classification of Operating Revenues and Operating Expenses," may be re-marked by the Clerk as Exhibit 214*a*.

(2) As two of plaintiff's exhibits were marked with the number 219, it is agreed that the second exhibit so marked, being "I. C. C. Classification of Income, Profit and Loss," may be re-marked by the Clerk as Exhibit 219*a*.

(3) The 21 sheets of assessed values and of figures appearing on the informal roll for Marquette City, found between pages 5164 and 5165 of the record, may be marked by the Clerk as Defendants' Exhibit 27*a* and filed and returned as an exhibit in this cause.

(4) Duplicates of Defendants' Exhibits 23, 24 and 25, as appearing on pages 5106, 5111 and 5117 of the record, may be filed with the Clerk, marked by him with the proper exhibit numbers, and filed and returned with the other exhibits in this cause.

(5) The Appendix to Defendants' Exhibit 72 may be filed with the Clerk, marked by him as Defendants' Exhibit 72*a*, and filed and returned as an exhibit in this cause.

414 (6) It is agreed that the printed compilations and comparison of Complainant's Exhibits 1, 1*a* and 50, and Defendants' Exhibit 15 with modifications, was prepared by the parties jointly, is what it purports to be and includes what it purports to include, and will be filed with the Clerk as a detail of the enumerated exhibits, and returned by him with the record, as an exhibit. Additional copies of this document, sufficient in number to comply with the rule, are now printed and will be furnished.

(7) The Master's report having been printed, a printed copy thereof may be filed with the Clerk, and when so filed will be returned as one of the proceedings in the cause.

(8) That Complainant's Exhibits 31, 32, 33, 34, 35, 35A, 36, 36A, 37, 38, 41, 42, 43, 44, 45, 45A, 46, 47, 47A, 48, 48A, 52, 53, 54, 55, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, and 87, having been printed, it is agreed that a bound volume of such exhibits, as printed, may be substituted for the originals, and that such bound volume may be returned with the original exhibits.

JOHN E. TRACY,
Of Counsel for Plaintiff.
ROGER I. WYKES,
Attorney for Defendants.

Dated Sept. 16, 1918.

Filed October 28, 1918.
ELMER W. VOORHEIS, *Clerk.*

415 UNITED STATES OF AMERICA:

In the District Court of the United States for the Eastern District of Michigan, Southern Division. In Equity.

No. 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, Morgan W. Joplin, John R. Van Evera, and Fred S. Case, Defendants.

EASTERN DISTRICT OF MICHIGAN,
Southern Division, ss:

I, Elmer W. Voorheis, Clerk of the District Court of the United States for the Eastern District of Michigan, do hereby certify and return to the claim of appeal of the above named defendants; that the foregoing is a true copy of all the records and proceedings, stipulated by counsel for respective parties to be included in my said return, as well as a true copy of narrative statement of the testimony in said cause not attached hereto, but certified under separate cover and consisting of four volumes, typewritten and each volume duly certified, all of which four bound volumes, and matter attached hereto, I have compared with the originals on file and of record in my office, and is a true and correct transcript therefrom and of the whole thereof as designated by counsel, with the exception of certain original exhibits designated by counsel to be by me sent up supplemental to the copies herein certified, which original exhibits are being transmitted securely boxed by express, and made a part of this my return in accordance with order of court dated October 30th 1918.

In testimony whereof, I have hereunto set my hand and affixed the seal of said court, at Detroit, in said District, this 21st day of November, in the year of our Lord one thousand nine hundred and eighteen, and of the Independence of the United States of America the one hundred and forty-third.

[Seal of the U. S. District Court, Eastern District of Michigan.]

ELMER W. VOORHEIS,
Clerk United States District Court,
Eastern District of Michigan.

415½ Vol. 1.

United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, et al., Defendants and Appellants.

As attorney for plaintiff in the above entitled cause, I hereby acknowledge service upon the plaintiff of a copy of a præcipe designating the exhibits to be returned and indicating the portions of the record to be incorporated in the transcript of record on the appeal of said cause to the Supreme Court, said præcipe being accompanied with a statement of the testimony indicated by the defendants as necessary to be incorporated into the transcript of record, and a statement by the defendants for the purpose of limiting the record on appeal, the same being embraced in four volumes, covering 1,752 pages, and having been received by me at Marquette, Michigan, on September 5, 1918.

JOHN E. TRACY,
Of Counsel for Plaintiff.

Dated Sept. 5, 1918.

STATE OF MICHIGAN,
County of Kent, ss:

Roger I. Wykes, being first duly sworn, deposes and says that the above listed documents were duly sent to Mr. A. B. Eldredge at Marquette, before his death, as service upon the plaintiff, and that such documents so served are the same as, and duplicate
416 copies of, the præcipe, testimony and statement filed herewith, and that the foregoing acknowledgment of service and the signature of Jno. E. Tracy thereto are what they report to be, and that such signature is genuine.

ROGER I. WYKES,
Attorneys for Defendants.

Subscribed and sworn to before me, this 7 day of October, 1918.

GRANT SIMS,
Notary Public, Kent County, Michigan.

My commission expires May 20, 1922.

417 United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, et al., Defendants and Appellants.

To A. B. Eldredge, solicitor for plaintiff:

In conformity with United States Supreme Court Rule No. 8, there is sent you, by American Express, a copy of a præcipe to be filed with the Clerk of said Court indicating the portions of the record to be incorporated into the transcript of record on the appeal of said cause.

The formal præcipe is preceded by a statement of the questions intended to be raised and insisted upon under the assignment of errors by the defendants, together with, stated in narrative form, so much of the testimony as the defendants desire incorporated into the transcript of record on appeal.

This præcipe, statement and testimony are sent you for the purposes:

(1) Of complying with said rule 8, and permitting you to designate such additional portions of the record as you desire incorporated into the transcript of record to be filed in the Supreme Court.

(2) As a basis of stipulation, if you desire to consider entering into such stipulation.

Yours, etc.,

A. J. GROESBECK,
Attorney General.
ROGER I. WYKES,
Of Counsel.

Dated August 30, 1918.

418 United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, et al., Defendants and Appellants.

Mauritz H. Fahlstedt, being first duly sworn, deposes and says that he served upon the plaintiff the attached notice, by enclosing

and sealing a true and compared copy thereof in an envelope properly addressed to A. B. Eldredge, Marquette, Michigan, attorney for plaintiff, and depositing the same in the United States mails at Grand Rapids, Michigan, with charges fully prepaid thereon, on September 4, 1918.

That on September 3, 1918, he sent to A. B. Eldredge, by American Railway Express, with charges fully prepaid thereon, four volumes, containing the præcipe, a statement of points to be raised, and a statement of the testimony, for the purpose of limiting the record, pursuant to United States Supreme Court Rule No. 8.

MAURITZ H. FAHLSTEDT.

Subscribed and sworn to before me this 4th day of September, 1918.

L. D. AVERILL,
Notary Public, Kent County, Michigan.

My commission expires Jan. 26, 1920.

419 United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, et al., Defendants and Appellants.

To Elmer W. Voorheis, clerk of said court:

An appeal having been claimed and allowed by said Court, this præcipe is herewith filed with you to indicate that it is the desire of the parties that you incorporate in the transcript of the record upon appeal the pleadings, documents, statement of evidence and stipulations and return the exhibits listed as follows:

Bill of Complaint. (Filed July 26, 1911. Docket No. 1.)
Order extending Time for Return on Order to show Cause, etc. (Filed Sept. 26, 1911. Docket No. 19.)
Answer. (Filed Dec. 2, 1911. Docket No. 21.)
Replication. (Filed Dec. 26, 1911. Docket No. 22.)
Order appointing Special Master. (Filed May 17, 1912. Docket No. 42.)
Opinion on Motion for Preliminary Injunction. (Filed May 29, 1912. Docket No. 45.)
Order continuing Preliminary Injunction conditionally. (Filed May 29, 1912. Docket No. 46.)
Bond of Complainant in pursuance of Order of Court dated May 29, 1912. (Filed June 13, 1912. Docket No. 48.)

Order continuing Restraining Order. (Filed Jan. 23, 1913. Docket No. 65.

420 Præcipe for Appearance. (Filed Dec. 10, 1914. Docket No. 73.)

Motion for Order permitting Appearance. (Filed Dec. 10, 1914. Docket No. 74.)

Stipulation regarding Corporate and Land Grant History. (Filed Dec. 10, 1914. Docket No. 77.)

Memorandum Order in re Deposit in Clerk's Office of Bank Receipts of one-third of Plaintiff's Gross Earnings. (Filed Oct. 25, 1915. Docket No. 78.)

Order regarding Fund to secure Payment of Refund Coupons. (Filed Oct. 29, 1915. Docket No. 80.)

Stipulation as to Certain Exhibits (substituting Duplicates, on account of Originals missing). Filed Feb. 1, 1917. Docket No. 337.)

Report of Special Master, Herbert L. Baker. (Filed Feb. 1, 1917. Docket No. 340.)

Defendants' Exceptions to the Report of the Special Master. (Filed Feb. 20, 1917. Docket No. 343.)

Complainant's Exceptions to the Report of the Special Master. (Filed Feb. 26, 1917. Docket No. 344.)

Opinion on Pleadings and Proofs. (Filed Jan. 9, 1918. Docket No. 362.)

Final Decree. (Filed Feb. 14, 1918. Docket No. 368.)

Petition for and Allowance of Appeal, and Assignment of Errors. (Filed March 6, 1918. Docket No. 369.)

Citation, with Acceptance of Service.

Motion and Order enlarging Time for Docketing Appeal and filing Record on Appeal, and Second Citation, with Acceptance of Service.

Motion and Order of Sept. 13, 1918, extending Time for docketing Appeal and returning Record.

Stipulation re exhibits. (dated Sept. 16, 1918.)

The Statement by the Defendants for the purpose of limiting the Record on Appeal, filed herewith.

Statement of the testimony taken before the Special Master and before the District Court, filed herewith.

This Præcipe.

421 You are also requested to send up with this transcript the following original exhibits:

Plaintiff's exhibits before the master:

1 Riggs, Appraisal of D. S. S. & A. Ry. in Michigan and Wisconsin as of June 30, 1911.

1*a* Riggs, Appraisal of D. S. S. & A. Ry. in Michigan as of June 30, 1913, showing Allocations to Services.

1*b* Riggs, Inventory and Allocation of Lands to Services as of June 30, 1913.

1*c* Riggs, Exhibit 1*b* amended.

2 Riggs, Condensed Profile, D. S. S. & A. Ry. (on same form as Defts.' Ex. 17).
3 Riggs, Map of Sault Terminal, Scale 1" equals 150'.
3a Riggs, Map of Sault Terminal, showing Allocations, Scale 1" equals 150'.
4 Riggs, Map of St. Ignace Terminal, Scale 1" equals 200'.
4a Riggs, Map of St. Ignace Terminal, showing Allocations, 1" equals 200'.
5 Riggs, Map of Marquette and Vicinity, Scale 1" equals 2,000'.
6 Riggs, Marquette Yard Map, Scale 1" equals 200'.
6a Riggs, Marquette Yard Map, showing allocations, Scale 1" equals 200'.
8 Riggs, Mining District, Negaunee and Ishpeming, Scale 1" equals 1,000'.
12 Riggs, Comparative Summary of Totals of Michigan, 1900, 1905 and 1911, Appraisals.
15 Riggs, Right of Way Property Map of D. S. S. & A. Ry., Negaunee and Ishpeming, Scale 1" equals 400'.
15a Belden, Portion of Ishpeming Yard at Station, Scale 1" equals 100'.
17 Belden, Map of Negaunee, C. C. I. Co. Print.
25 Delf, I. C. C. Classification of Locomotive Train and Car Mileage, first issue, 1907.

422

26 Delf, I. C. C. Classification of Operating Revenue. First Issue 1907.
27 Delf, I. C. C. Classification of Expenditures for Additions and Betterments. 1st revised issue 1910.
28 Delf, I. C. C. Classification of Operating Expenses. 3rd revised issue 1907.
29 Delf, I. C. C. Supplement to Exhibit 28, 1908.
30 Delf, I. C. C. Classification of Revenue and Expenses for Outside Operations. First Issue 1908.
31 Delf, Statement of Mileage of road owned, 1910-1911-1912. Printed.
32 Delf, Revenue Locomotive Mileage, 1910-1911-1912. Printed.
33 Delf, Revenue Train Mileage, 1910-1911-1912. Printed.
34 Delf, Car Mileage, 1910-1911-1912. Printed.
35 Delf, Operating Revenues, 1910-1911-1912. Printed.
35a Delf, Substitute Analysis of Joint Facilities. Printed.
36 Delf, Division of Operating Revenue in Michigan, assigned to freight and passenger, 1910-1911-1912. Printed.
36a Delf, Substitute Analysis of Joint Facilities. Printed.
37 Delf, Routes and Compensation for Hauling Mail, 1907-1912. Printed.
38 Delf, Statement of Operating Expenses, 1910-1911-1912. Printed.
39 Delf, D. S. S. & A. Report to Stockholders for 1911. Printed.
40 Delf, D. S. S. & A. Report to Stockholders for 1912. Printed.

41 Delf, Outline of Method used in dividing Operating Expenses between States and Services. Printed.
42 Delf, Tons of Freight Carried, Length of Haul, Rate per Ton, etc. Printed.
43 Delf, Passenger Statistics in Michigan, Numbers of Passengers Carried, Length of Haul, Rate, etc. Printed. 1902-1912.

423

44 Delf, Freight Statistics, Michigan, 1912. Printed.
45 Delf, 1910 Business, Summary of Revenue, Operating Expenses, Divisions and Results. Printed.
45*a* Delf, Detail of Divisions to Freight and Passenger for certain items. Printed.
46 Delf, Method of Equation of Passenger Business, in Divisions between Interstate and Intrastate. Printed.
47 Delf, 1911 Business, Summary of Resources, Operating Expenses, Divisions and Results. Printed.
47*a* Delf, Details of Divisions to Freight and Passenger for certain items. Printed.
48 Delf, 1912 Business, Summary of Revenue, Operating Expenses, Divisions and Results. Printed.
48*a* Delf, Detail of Divisions to Freight and Passenger for certain items. Printed.
50 Riggs, Modifications of Exhibit 1, as made or indicated in Cross Examination.
52 Delf, Statement showing Loss by Act 276, 1910, 1911, 1912. Printed.
53 Population and Railroad Mileage in Michigan, 1910. Printed.
54 Delf, Operations, Resources and Disposition of Complainant, 1887-1913. Printed.
55 Delf, Operating Income, Expenses, Ratios, Maintenance, Taxes, Various Roads. Printed.

424

61 McPherson, D. S. S. & A. Train Sheet for Feb. 4, 1912.
62 McPherson, Chart showing Actual D. S. S. & A. Train Movements, Houghton Division, for Feb. 4, 1913.
63 McPherson, Time Table #228, Houghton Div., Jan. 5, 1913.
64 McPherson, Movement of Passengers for 1912.
65 McPherson, Delf's Statement of Tickets Sold in Michigan, 1911.
67 Delf, Accounts, Separation and Results for 1913. Printed.
68 Delf, Estimate of Loss for 1913.
69 Delf, Operating Expenses Divided between States and Services by primary accounts in Detail, 1910. Printed.
70 Delf, Operating Expenses Divided between States and Services by primary accounts in Detail, 1911. Printed.
71 Delf, Operating Expenses Divided between States and Services by primary Accounts in Detail, 1912.
72 Delf, Operating Expenses Divided between States and Services by primary accounts in Detail, 1913.
73 Delf, Freight Traffic Statistics, 1914.

74 Delf, Michigan Freight Station Service, 1912.
75 Delf, Michigan Freight Train Mileage, 1912.
76 Delf, Michigan Freight Expense, 1912.
77 Delf, Michigan Freight Revenue, Interstate and Intrastate, 1912.
78 Delf, Michigan Freight Expense, 1913.
79 Delf, Michigan Freight Revenues, Interstate and Intrastate, 1913.
80 Delf, Michigan Freight Train Mileage, 1913.
81 Delf, Values of Individual Locomotives, Separated to Services by Mileages, 1913. Printed.
82 Delf, Bank Balances, 1902-1911. Printed.
83 Delf, Locomotive Mileages Separated to Services, 1910-1913. Printed.
425
84 Delf, 1913 Intermingling Mileages, by Months, of Certain Locomotives used in Common or in more than one Service. Printed.
85 Delf, Ticket Sales, Years ended June 30, 1911, 1912, 1913. Printed.
86 Delf, Locomotive Repairs, to Locomotives by numbers, 1910-1913. Printed.
87 Delf, Complainant's Exhibits regarding less than car loads, station service, 1913.
93 Davis, Map of Negaunee, C. C. I. Co. Print.
94 I. C. C. Classification of Operating Expenses, 1914.
95 Berry, Speed Chart, St. Ignace to Marquette, July 16, 1914.
— Printed Volume of Complainant's Exhibits before the Master, 31 to 38 inclusive and 35*a* and 36*a*, 41 to 48 inclusive and 45*a* and 48*a*, 52 to 55 inclusive, and 67-87 inclusive.
— Printed Comparative Tabulation of Valuation Exhibits (Plaintiff's 1, 1*a* and 50 and Defts.' 15).

Defendants' exhibits before the master:

4 Robertson, List of Property in Marquette.
10 Delf, showing Maintenance Expenses by Divisions, April 1910, May, 1911, and Year 1912.
11 Delf, Speed of D. S. S. & A. Passenger Trains.
13 Delf, Speed of Freight Trains on D. S. S. & A.
15 Hansel, Appraisal of D. S. S. & A. Property in Michigan as of October 1, 1912.
17 Hansel, Condensed Profile, D. S. S. & A. (on same form as Complt.'s Ex. 2).
18 Hansel, Map of Sault Terminal, Scale 1" equals 150'.
19 Hansel, Map of St. Ignace Terminal, Scale 1" equals 200'.
20 Hansel, Map of D. S. S. & A. Property at Marquette, Scale 1" equals 200'.
426
21 Hansel, Right of Way Map, D. S. S. & A. Property in Mining Region at Negaunee and Ishpeming, Scale 1" equals 400'.

23 Vol. 5, 1900 State Appraisal of D. S. S. & A., pages 64-99.
24 Summary Sheet, 1902 State Appraisal of D. S. S. & A.
25 Summary Sheet, 1905 State Appraisal of D. S. S. & A.
26 Report of State Board of Equalization, 1911.
27 Computation by Parker, showing Values and Assessments.
27*a* Tabulation by Parker, showing Values placed on certain Real Estate in Marquette by Citizens' Committee.
30 Computation, by Parker, of Sales, 2 and 10 mile belt.
31 Report of State Board of Equalization, 1901.
32 Report of State Board of Equalization, 1906.
41 Adams, Large Land Grant Map.
43 Printed D. S. S. & A. Ry. Reports; 1905; *a*, 1906; *b*, 1907; *c*, 1908; *d*, 1909; *e*, 1910; *h*, 1913.
46 Delf, Additions and Betterments, 1900 to 1913.
61 Statements of South Shore Land Co., 1904-1913.
62 Report of State Tax Commission and State Board of Assessors, 1911 and 1912.
64 Arguments before State Board of Assessors by D. S. S. & A. Representatives, 1904-1905 and 1907.
65 Report of Land Grant Trustees, D. M. & N., Feb. 1879, to Jan. 1, 1912.
70 Certain Tabulations of J. P. Muller, relative to methods for dividing Operating Expenses. (Marked Ex. 98, through error.)
71 Chart showing Corporate Relationships of D. S. S. & A. and Constituent Companies. (Marked Ex. 99, through error.)
72 Thompson, Schedule of Operating Expenses on D. S. S. & A., 1912, introduced June 3, 1914.
72*a* Thompson, Derivation of Ratios—Appendix A.
4
73 [illegible], Geological Map of Upper Peninsula.
74 [illegible]er, Gross Ton-mile Data for Division of 1913 Accounts.
77 P[illegible]er, 1913 Revenue, Distribution of Operating Expenses and Results.
80 Delf, Western Rate Inquiry, pages 68-69. Comparison of Methods of separating Operating Expenses.
83 Batchelder, Three Blue Prints showing D. S. S. & A. Rail Sections, and Wear on Upper and Lower Sides of Rail on Curves.

Exhibits to the master's report as follows:

— Computations to arrive at Figures in Master's Exhibit I. (Filed Feb. 1, 1917. Docket No. 339.)
— Exhibit A, and numbers 1 to 8, to Report of Master. (Filed Feb. 1, 1917. Docket No. 341.)
— Computations to arrive at Figures in Master's Exhibits 2 to 8. (Filed Feb. 1, 1917. Docket No. 342.)

428 Plaintiff's exhibits before the court (on the trial):

201 Cadarette, Valuation of D. S. S. & A. Ry. in Michigan as of June 30, 1917, showing Retirements and Additions since June 30, 1913.
201*a* Cadarette, Valuation of D. S. S. & A. Ry. Property as of June 30, 1914.
201*b* Cadarette, Valuation of D. S. S. & A. Ry. Property, as of June 30, 1915.
201*c* Cadarette, Valuation of D. S. S. & A. Ry. Property, as of June 30, 1916.
202 Delf, Operating Statistics, D. S. S. & A. Fiscal Year, 1914.
203 Delf, Operating Statistics, D. S. S. & A. Fiscal Year, 1915.
204 Delf, Operating Statistics, D. S. S. & A. Fiscal Year, 1916.
205 Delf, Operating Statistics, D. S. S. & A. Fiscal Year, 1917.
206 Delf, Operating Expenses, Assignments and Results of passenger Operation for Fiscal Year 1914.
207 Delf, Same as 206, for Fiscal Year 1915.
208 Delf, (Same as 206), for Fiscal Year 1916.
209 Delf, (Same as 206), for Fiscal Year 1917, and Cost of Maintaining Exclusive Freight Tracks, 1914-1915-1916-1917.
210 Delf, Division used in assigning to Passenger the Michigan Operating Expenses for 1914-1915-1916-1917.
211 Fowler, Locomotive Values, 1914-1915-1916-1917.
211*a* Fowler, Unit Prices used for Locomotives, 1914-1915-1916-1917.
212 Fowler, Passenger-train Car Values, 1914-1915-1916-1917.
213 Fowler, Freight-train Car Values, 1914-1915-1916-1917.
214 Fowler, Values of Shop Machinery and Tools, 1914-1915-1916-1917.
214*a* Delf, I. C. C. Classification of Operating Revenue and Operating Expenses.
429
215 Delf, Index to Exhibit 214*a*.
216 Delf, I. C. C. Classification for Additions and Betterments.
217 Delf, I. C. C. Rules for separating Operating Expense between Freight and Passenger.
218 Delf, I. C. C. Classification of Train Miles, Locomotive and Car Miles.
219*a* Delf, I. C. C. Classification of Income, Profit and Loss.
219 Delf, D. S. S. & A. Track Chart of Houghton Division.
220 Delf, Statement of D. S. S. & A. Ry. in Michigan, showing total operations, Freight and Passenger, and Net Income from Total Business.
221 Rates of return on Certain Property Schedules.

Defendants' exhibits before the court (on the trial):

301 Land Map, of Rural Lands of D. S. S. & A.
302 Claims of Value of D. S. S. & A. Land.
303 Assessed Values of D. S. S. & A.
304 1914 Report D. S. S. & A. to State Board of Assessors.
305 1915 Report D. S. S. & A. to State Board of Assessors.

306 1916 Report D. S. S. & A. to State Board of Assessors.
307 Additions and Betterments; reported to the State, 1914-1916. Parker computation for 1917.
308 Traffic Statistics, D. S. S. & A. 1902-1917.
309 Tonnage of D. S. S. & A. Passenger Trains from Train Consists.
310 Mileage of Foreign Sleepers on D. S. S. & A. Passenger Miles in Same, and Average Number of Passengers per Car Mile, 1916-1917.
311 Passenger Miles in Foreign Sleepers on D. S. S. & A. Interstate and Intrastate, 1916-1917.
312 Passenger Miles in D. S. S. & A. Sleepers, Interstate and Intrastate, 1916-1917.
430
313 Passenger Miles subdivided to Coaches and Sleepers, on D. S. S. & A., 1916-1917.
314 Passenger and Freight Train Weights per Train Mile, 1912-1917.
315 Average Weights of D. S. S. & A. Passenger Equipment, per Car Mile, 1912-1913-1914-1917.
316 1881 Original Report of D. M. & M. to Railroad Commissioner.
318 Articles D. M. & M.
319 Dadson Analysis of Reports, M. H. & O., M. & W., D. M. & M., M. & M. Rd. and D. S. S. & A.
320 Prof. Williams' Exhibit of Track Stresses under Traffic, etc.
321 Kates' Valuation, Present Locomotive Equipment of D. S. S. & A. 1914-1917.
321*a* Kates' Valuation of Locomotives on D. S. S. & A. Retired since September 1913, amending Exhibit 321.
322 Kates' Valuation of Passenger Cars, 1914-1917.
323 Kates' Valuation of D. S. S. & A. Freight Cars, 1914-1917.
324 Kates' Locomotive Price Units, etc.
325 Parker, Separation of Accounts, Revenues, Expenses and Results, 1914-1917.
325*a* Parker, showing amounts of Maintenance of Way and Structures expenses assigned on different Bases, 1917.
325*b* (Same as 325*a*) except for 1914.
325*c* (Same as 325*a*), except for 1915.
325*d* (Same as 325*a*), except for 1916.
326 Intrastate and Interstate Passenger Miles of D. S. S. & A. Compared, 1910-1917.
326*a* Revision of Exhibit 326, also Computation made at request of Mr. Tracy.
327 Kates, Mortality, Depreciation and Expectancy Curves used in his Valuation of Equipment.
329 Hillman, Division of Accounts, Revenues, Expenses and Results, 1914-1917.
330 Hillman, Mackinaw Transportation Company Expenses and *and* Passenger Revenues, 1914.
431
331 Hillman, Average Tie Life on D. S. S. & A.

332 Hillman, State's Claim of Valuation in 1913, plus Additions and Betterments subsequent.
333 Hillman, Master's Valuation in 1913 brought to date.
334 Hillman, Master's and State's Valuation- for 1913, 1914, 1915, 1916, 1917.
335 D. S. S. & A. Forms for Distribution of Track Material, etc.
336 D. S. S. & A. Forms for Distribution of Track Labor.
337 Parker, Assignment (or Redistribution) of Expenses of Sleeper Service to Passengers and Baggage, Intrastate and Interstate, 1917.
338 Parker, Redistribution of Sleeper Expenses, on Express Weight Basis, 1917.
339 Hillman, State's Claimed Value for 1913, plus Additions and Betterments of 1914-1917, and Computations of Net Return.
340 Hillman, Constant Costs which would exist regardless of Sleeper and Diner Service, 1915, 1916, 1917.
341 Hillman, Amounts paid Soo Union Depot Employees, 1917.
342 Hillman, Amounts of Expenses assigned on Various Factors (Maintenance of Way and Structures).
343 Parker, Value of Property in Michigan distributed to Services on Time Basis, 1914.
344 Parker, Value of Property in Michigan distributed to Services on Time Basis, 1915.
345 Parker, Value of Property in Michigan distributed to Services on Time Basis, 1916.
346 Parker, Value of Property in Michigan distributed to Services on Time Basis, 1917.
347 Parker, Computations of Net Return on Basis of Ex. 325, 1914-1917.

Dated October 29, 1918.

ROGER I. WYKES,
Attorney for Defendants & Appellants.
JOHN E. TRACY,
Attorney for Plaintiff & Appellee.

432 You are requested to return the bound volume of map exhibits, which contains Plaintiff's exhibits 2 to 10 inclusive, 3*a*, 4*a*, 6*a*, 10*a*, 10*b*, 15 to 17 inclusive, 15*a*, 16*a*, 19 to 24 inclusive, 66 and 93; also Defendants' exhibits 17 to 22 inclusive, 39, 42, 52 and 73.

Plaintiff's exhibits 201 to 210 inclusive are included in a single printed volume.

The printed report of the Master may be substituted for the typewritten report for use in the Celrk's transcript.

The Railroad Map of the State of Michigan, marked Exhibit A-1 for the use of the Court on the trial, should be returned with the other exhibits.

433 The parties defendant are the present (October 29, 1918) Attorney General and members of the Michigan Railroad Commission, and the various incumbents of such offices, from the in-

stitution of the proceeding to the present time, have been from time to time substituted by proper stipulations and orders.

It is hereby agreed that the pleadings above listed will be included in the transcript of record on appeal, and that the originals of the exhibits above listed (or copies thereof which have been duly substituted as originals) will be returned to the Supreme Court as the record on appeal, and we consent to an order directing the return of such exhibits as originals, subject, however, to the right to have further exhibits returned as provided by the rules in case it shall later be found that anything is inadvertently omitted.

Dated October 29, 1918.

ROGER I. WYKES,
Attorney for Defendants and Appellants.
JOHN E. TRACY,
Attorney for Plaintiff and Appellee.

It is hereby ordered that the exhibits listed above be transmitted to the Clerk of the United States Supreme Court for inspection by said Court and be considered as a part of the record on appeal and be returned to this Court upon the determination of such appeal or at such other time as may be directed by proper order.

Dated October 30", 1918.

C. W. SESSIONS,
District Judge.

1 United States District Court, Eastern District of Michigan, Southern Division. In Equity.

Former C. C. Case 4117.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee,

vs.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, et al., Defendants and Appellants.

RECORD ON APPEAL.

Statement by Defendants for the Purpose of Limiting the Record on Appeal.

(1) No question will be raised by defendants of the cost of reproduction of the property and depreciated value of that cost, as found by the Master as of June 30, 1913, in the amount of $13,945,846, except as to the items following:

(*a*) Item 1, Right of Way & Station Grounds. The Master found a cost of reproduction of $1,780,239, as against defendants' claim of $1,145,413. Defendants will contest the values for land as found by the Master for lands located in St. Ignace, Sault Ste. Marie,

2 Marquette City and Marquette County; also the values included for mineral, water and riparian rights at St. Ignace, Marquette City and County and Houghton, and the values claimed for trackage rights at Marquette and Negaunee.

(*b*) Item 3, Grading. Defendants will not contest the quantities of grading as found by the Master, but will insist that the proper price therefor was 25 cents per cubic yard.

(*c*) Item 6, Ties. Defendants will contend that for this item the price allowed by the Master was too high, and the percentage of depreciation insufficient to represent actual condition.

(*d*) Items 10, Ballast, and 11, Track Laying and Surfacing. Defendants will contend that these items should have been reduced by the Master to their depreciated condition, and that their actual condition is less than their replacement cost.

(*e*) Items 29, Engineering on Roadway and Structures, and 35, Engineering on Equipment. Defendants will insist that the item of $255,000, allowed by the Master for Engineering on Roadway and Structures is sufficient to cover the entire cost of engineering, and that the item of Engineering on Equipment is improper for

3 that reason, and for the reasons that it does not represent actual expenditure or cost to the plaintiff out of capital funds, and that the amount allowed therefor is an estimate only.

(*f*) Items 37, Contingencies; 38, Legal Expenses during Construction; 39, Organization and Administration; 40, Interest during Construction; 40, Taxes during Construction; and the item Appreciation, will be contested as improper and excessive as included in the cost of reproduction by the Master.

(*g*) Items 42, Stores and Supplies, and 43, Working Capital, will be claimed to be excessive in that the amount of $272,811 allowed by the Master for Stores and Supplies is sufficient to cover both the items, and that there is, for that and other reasons, no propriety in the allowance made for Working Capital.

(*h*) Item 34, Ferries and Steamships, will be claimed to be improperly included in plaintiff's cost of reproduction for the purposes of this case, unless the net earnings from passengers thereover are also included.

(*i*) The additions to property made after June 30, 1913, will be claimed to be as set forth in plaintiff's reports to the State

4 Railroad Commission, and as included and added in defendants' exhibits.

(*j*) This specification is not intended to admit the propriety of the cost-of-reproduction method of ascertaining the value of the property, but defendants will claim that the property is worth less, and that the plaintiff can only claim a return upon an amount less than the cost of reproduction affected by depreciation.

(*k*) So far as property has been created out of, or charged to, operating expenses, and not to capital account, the plaintiff should have shown the fact and defendants will object to the propriety of its inclusion in fixing value for rate-testing purposes.

(*l*) The south line, Marquette to Winthrop Jct., will be claimed

to have been improperly included in the cost of reproduction of the property used in the passenger business, on the theory that that line is required only because of the ore business, was purchased to retire competition, would not have been constructed for the purposes of the passenger business, and is not necessary for the proper conduct thereof.

(2) Defendants will not question the allocations of property to services, freight, passenger and common, but will claim that the methods pursued by the Master and by the District Court for dividing the common property between services—freight and passenger, and interstate and intrastate passenger—has not been established by the evidence and are improper.

5 (3) Defendants will claim that the passenger revenues over the Mackinaw Transportation Company property must be included as passenger revenues in this proceeding.

(4) Defendants will make no objection to the witness Delf's and the Master's allocations of expenses to (*a*) exclusive freight, (*b*) exclusive passenger, and (*c*) common to freight and passenger services, except that they will claim:

(*a*) That the setting off of expenses of the maintenance of exclusive freight trackage, as done by the Master and by the witness, Delf, do not constitute allocations and are improper in that insufficient amounts are set off to represent the actual cost of maintenance of such exclusive freight trackage.

(*b*) That the items of expense, Station Employees and Station Supplies and Expenses, as divided between freight, passenger and common, do not constitute allocations, and that the divisions are made on improper bases.

6 (5) All questions as to the division of common property and common expenses between freight and passenger services, and of common passenger property and expenses between interstate and intrastate passenger business, and of the common passenger expenses between passengers and baggage on the one hand and sleepers, diners, mail and express on the other hand, are reserved, and the methods of the witness, Delf, the Master and the District Court, are claimed to be unsupported by the evidence, arbitrary, general, conjectural, insufficient and improper.

(6) The losses or deficiencies in net earnings, if any, are and will be claimed to be the result of the freight, the ore, the interstate passenger, and the sleeper, diner, mail and express business, collectively or separately, and not the result of the intrastate passenger business in whole or in part.

(7) The loss or deficiency in net earnings, if any, will be claimed to result on, or to be materially contributed to by, the Western Division (Nestoria to the State Line), which, upon a proper analysis and separation of accounts, may show losses due to comparatively high maintenance costs and sparseness of traffic, and it will be claimed that, as that line was created for, and is principally engaged in, interstate service, the proofs should have been made so as to permit a separation of the income and expenses on that division, in

7 order to permit a determination of whether the loss or deficiency in net earnings, if any, was not in fact entirely due to the interstate traffic carried on over that division.

(8) The claim will be made that plaintiff has not overcome the presumptions in favor of the validity of a rate-fixing statute, and that its proofs are insufficient to establish or to furnish a basis for proper divisions of property or expenses between services, and insufficient to permit a conclusion with reasonable certainty of the cost and net return upon the intrastate passenger business carried at the statutory rates; that such proofs do not meet the requirements of the Minnesota and associated rate cases, and that too much is left to conjecture, opinion and inference, and the general judgment of witnesses, without the keeping of accounts which might and should have been kept to show with reasonable approximation the exact conditions.

(9) All questions relating to following subjects are reserved:

(*a*) Income due to unearned increment or value increases.

(*b*) Amounts included in the operating expenses of particular years, which represented expenditures for additions and betterments or to make good past depreciation or for deferred maintenance.

8 (*c*) The application and propriety of the claimed increased prices of labor, materials and construction, and equipment items, of 1917.

(*d*) The presumptions applicable to, and the certainty required by the proofs of the plaintiff in, a rate case, and the sufficiency of the proofs made.

(*e*) Whether the rates should be or should have been, given an experimental test before restrained.

(*f*) The propriety of deducting an assumed loss claimed to be due to the decreased rate, without experimental test and without proof.

(*g*) The propriety of the revenue train mile basis or any modification thereof, the gross ton mile basis, the time and ton mile basis, the direct costs basis, or any other basis, for the division of common expenses between services.

(*h*) The comparative cost of carrying passengers in interstate and intrastate services, and the comparative cost of carrying passengers in sleepers and in ordinary coaches.

(*i*) The inclusion of costs of lands for minerals, special adaptation and water and trackage rights.

(*j*) The effect of land grants and of the contributions of a portion of the property by the public.

(*k*) Original cost of investment, or commercial value, as opposed to cost of reproduction, less depreciation.

9 (*l*) The rate of return which a utility is entitled to earn.

(*m*) The exclusion of operations over, and operating expenses upon account of, the Mineral Range.

(*n*) The separation to states of property located in one state, but serving the business of the entire line, as well as the expenses incident thereto.

(10) All questions not expressly waived are intended to be reserved.

10 *Testimony Before the Special Master.*

11 On July 8, 1912.

HENRY EARLE RIGGS, a witness called by plaintiff.

Direct examination.

By Mr. Butler:

I live in Ann Arbor, Michigan. I am a Civil Engineer. I was graduated from the University of Kansas in 1886 with the degree of Bachelor of Arts, and have received the degree of Civil Engineer from the University of Michigan. In 1886, I entered the service of the Burlington & Missouri River Railway in Nebraska, on construction. In 1887, I went into the service of the Atchison, Topeka & Santa Fe Railway, on construction, and in 1888 was transferred to maintenance of way. In 1890, I was appointed Chief Engineer of the Toledo, Ann Arbor & North Michigan, now the Ann Arbor Railway, and remained in that capacity until 1896, when I formed a partnership with Mr. W. J. Sherman, Chief Engineer of the Wheeling & Lake Erie Railway, for the private practice of engineering, which partnership continued until this year, when I became Professor of Civil Engineering at the University of Michigan.

I have given special attention to the subject of the appraisal or valuation of railroads and other public service properties. In 1900, I was appointed by Prof. M. E. Cooley, appraiser of railways for the Michigan State Tax Commission, to take charge of the civil engineering section of that work, and was a principal assistant from start to finish, and on the subsequent work of Prof. Cooley in 1903, and also in 1906, for the State, I had the same position.

I have been employed in appraisal work by Spitzer & Company, bankers and bond dealers, since 1904, and have done all the work of that firm, making a number of appraisals, among which were the Consolidated Power Company of Vermont, the Jackson &

12 Battle Creek Electric Railway and Water Works plants, at San Antonio, Texas, San Angelo, Texas, Canyon City, Colorado, and a number of other water-works, gas and electric companies.

In 1910, I was employed by the Edison Sault Electric Company to make an appraisal of its physical properties at Sault Ste. Marie, in connection with the condemnation suit by the United States Government.

In 1909, I was employed by the Manhattan Trust Co. of New York, in connection with the Central of Georgia Railroad Co. income bond suits, and made a valuation of that property in the states of Georgia and Alabama.

In 1910, I was employed to make an examination of the property and the construction accounts of the Buffalo, Rochester & Pittsburgh Railway, and spent some months on that work.

I have made valuations of the street railway properties at Savan-

nah, Georgia, for the City of Savannah, in connection with a rate case, and at Atlanta, Georgia, for the Georgia Railroad Commission.

I have been employed with Prof. Henry C. Adams, on valuations of electric power properties in Michigan for the Railroad Commission, and by the Railway Commission of Georgia on the same class of property in Georgia.

For the last six years, my practice has been almost exclusively in connection with valuation work, and I have given but little attention to construction or design.

I had charge, in 1900, and in all subsequent valuations under Prof. Cooley, of the civil engineering work, the roadways, structures,
13 right of way, and all of the property and structures of the railroads, except the motive power, rolling stock, shop machinery and tools, telegraph and telephone, and I had charge of the office organization, the preparation of the reports and compilation of final figures.

The appraisal of 1900 included the property of the Duluth, South Shore and Atlantic Railway Co., and all other railways in the State. My personal connection with the 1900 work was supervisory in the main; I saw part of the mileage in the Lower Peninsula, and during that work was not personally on the lines of the Plaintiff.

The property was inspected under my direction, by experienced railway engineers, being divided, as I now recollect, into several inspection divisions, the work being done by two or three different men.

The work of 1903, under Prof. Cooley, was revision of the 1900 appraisal, in which no complete inspection of any of the properties, and no personal inspection of the Upper Peninsula property, was made. The appraisal of 1900 was taken as a basis. Certain changes in unit prices were made, to take care of the difference in cost of material and labor between 1900 and 1903, and the additions and betterments to the property as reported to the Railroad Commission were added to the former appraisal, and a considerable investigation in regard to right of way values was made in the Lower Peninsula, especially on the Michigan Central Railroad, and, based upon those investigations, quite considerable changes in real estate and right of way valuations were made as applied to the Lower Peninsula roads. No such investigations were made in the Upper Peninsula.

I have now made appraisal of the D. S. S. & A. property as of June 30, 1911, commencing with force of men about Aug. 15, 1911; procured complete inventories and inspected property, going
14 over all the lines once and parts of the line 2 or 3 times, spending 2 or 3 weeks at Marquette. There, from early Sept. until late Dec., I was engaged in necessary correspondence, checking and securing additional information to get complete data on which to base figures. Actual computations were completed before Jan. 1, 1912, and reports made to counsel, about Jan. 15, of the completed appraisal.

Book, marked Complt.'s Ex. 1, Riggs, is my appraisal of South Shore property. Sheet 1 is summary embracing value of the property of the system, except Minnesota. This shows 43 classes of items; I have followed this classification throughout. Pages 2 and 3 are a summary by items of the valuation of the property in Michigan; the

details follow to page 301. Page 4 is a mileage summary, main and bra-ch lines. Have varied Cooley schedules, introducing item 16, side tracks, which includes all items of material and labor for side tracks.

Sheet 4 gives in detail the tracks included in various schedules other than 16, showing (*a*) main track, (*b*) second track, and (*c*) branches. Page 5 shows map of D., S. S. & A., being same as first page of condensed profile. (Condensed profile marked Complt.'s Ex. 2, Riggs.)

In making appraisal, I had Complt.'s Ex. 2, Riggs, which indicated ballast and rail record. In making calculation, I used original records, checking them against the profiles. On Complt.'s Ex. 2, the track and rail record showing ballast and rails is brought to January 1, 1912. Complt.'s Ex. 2 gives maps and profiles of main line and principal branches, but not of minor branches, as branches to mining properties, short lines like Bessemer Branch, and other 1 and 2 mile lines or side tracks or minor spurs. All lines given on page 4, Complt.'s Ex. 1, as main track, but none of track listed as branches, appear on Complt.'s Ex. 2.

15 Page 6 of Complt.'s Ex. 1 is a general map of the Soo. All of the property shown here is, in effect, jointly owned by South Shore and Soo lines, each having one-half interest in the whole, through a 99 year lease. I have considered the properties at Soo, treated in appraisal as joint, irrespective of title.

Page 7, Complt.'s Ex. 1, and following pages, show detail of estimate of cost of reproduction of right of way, including expense of purchase and condemnation, abstracts, fees and commissions, a total of $2,221,923, excluding Soo Bridge right of way.

(The following is a comparison of Riggs, 1911, and Hansel, 1912, figures on schedule 1, Right of Way and Station Grounds: Hansel, value new $1,370,883; present condition 100%; present value $1,370,883; under Riggs, $851,040. Riggs value new $2,221,923; present condition 100%; present value $2,221,923.)

(Subject to correction, stipulated, Soo Union Depot Co. is a corporation, one-half its stock being owned by Soo Line (M., St. P. & S. S. M.) and one-half by plaintiff.) Each of these companies has title to certain of the terminal property at Sault Ste. Marie, and each has given to the other a 99-year lease of an undivided half of its respective property.

The first description of 13 plus acres of Soo Union Depot Co., has upon it the depot and terminal structures, and is devoted to railway terminal use.

The term "real estate" in the schedule means the bare land.

Seven or eight months previous to this appraisal, I made an appraisal of property of Electric Company, taken over by Gov-
16 ernment, at Soo. In that connection, I spent nearly three weeks at Soo, going over entire railroad line in city limits a dozen or 15 times, becoming very familiar with company property there.

I arrived at the figures in Soo, as well as for most of the property of company outside of Marquette, by placing on the different pieces of

property my own estimate of value, based on general knowledge of values at the Soo secured in connection with previous valuation and recent inspection, and affected to a considerable extent by inquiries made by me while on inspection trip as to general and specific values; with examination of the maps, taking all these things into account, I placed these values as representing my best judgment of the value of the property for railroad purposes, taking into account all of the elements of cost of acquiring, the value of the land, and the damages on account of severance. That general statement would apply to all the right of way values at Marquette, where I used a somewhat different method.

(Witness separated by descriptions and reference to page 6, Complt.'s Ex. 1, land owned by the two companies, South Shore land being 80.42 acres and Soo line land being 84.31 acres.) All riparian rights and all the property fronting on the harbor are owned by South Shore.

(Complt.'s Ex. 3, Riggs' map of Soo yard, scale 150 feet to inch.) On this Exhibit, green boundary lines show union depot property, red boundary lines show South Shore property and yellow boundary lines show Soo Company property; all are jointly used. Of Union Depot Co. property one-half was assigned to complainant. Assuming that property not now devoted to railroad use, but privately owned, I don't believe it would be possible to acquire it for less than
17 $100,000. Under some circumstances, I don't believe the property under item 2 (*a* and *b*) could be acquired today for less than $350,000 to $400,000.

Page 8, Complt.'s Ex. 1, right of way and station grounds, Sault Ste. Marie to Soo Junction, or county line, including all in Chippewa County outside Soo.

General width of right of way is 100 feet; in a few places it is 66 or 80 feet, and in a few it is 50 extra feet at small stations; in most of the counties it is 100 feet. In right of way 100 feet wide, there is approximately 12 acres to a mile.

Sault Ste. Marie to the county line, right of way uniformly 100 feet, except 1.5 miles, 150 feet, and 5 miles, 75 feet; acreage indicated, page 8, computed from right of way maps.

I am able to form an opinion as to the relation of cost of acquisition of rural or county right of way of South Shore, with acreage or land value by forties, or other convenient agricultural tracts through which it runs, assuming the railroad right of way not now used for that purpose, but to be acquired by purchase or condemnation proceedings for a railroad. I could express a relation as to the average of all country lands, outside of the territory in Marquette county affected by mineral rights, known or prospective.

I should say that in acquiring a right of way for a new railroad through these lands, assuming the present railroad to be obliterated, it would be necessary to pay as a consideration to the owners of the lands from two and one half to three times the market value of the land considered in tracts of such size as are usually sold, say 40
18 acres, which consideration would include the lands and the severance damages, and in addition to such figures it would be

necessary to add the cost of acquiring the property and looking up the title, the services and expenses of right of way agents, attorneys, abstractors, and other expenses necessarily incurred in the acquisition of the lands. In answer, I excluded Marquette county; the relation, 2.5 to 3 times, is the average relation.

In Chippewa County, the railroad line does not in any instance follow section lines, but runs angling across the sections or parallel with section lines at some distance away. On, perhaps, not over 10 or 12 miles in Michigan is the road on section or quarter section lines.

I assumed the railroad not in existence at its present place, but that the country along right of way was developed in other respects, as now. The timber has been cleared off the right of way, and it is generally grubbed; in better condition than almost any line in Upper, or upper part of Lower, Peninsulas, through similar country. I assumed 85% of main line mileage now timbered, in some form or other. The general practice in the Upper Peninsula is to place a price on land, plus estimated timber value. Land prices range, on uncleared lands, $7 or $8 per acre plus timber value, from a minimum of $10 or $12 to a maximum of $50 or $60 per acre. In making calculations, I assumed the land to be acquired as right of way in the same condition as the abutting land.

I include in appraisal the acreage price for clearing, grubbing, etc., assuming land covered with same kind of timber as adjacent land, and that it would be necessary in buying the land to pay for the timber, and also to clear and grub to construct the railroad.

19 If timber was on abutting land, I assumed it to be on right of way, also, and that it would have to be paid for. I did not take into account value of timber to railroad company for sale or use in building, as it would have no practical value; the cost of cutting, saving the timber and putting in shape for use would be too great. I know a few instances where that was attempted, but none where it was continued, because of increased expense of railroad construction. It would not be practical to make ties from tie timber on right of way.

The figure per acre set down by me is, I believe, conservative and a reasonable figure for cost of acquiring the land, taking into account all the elements and assuming it to be in the condition of abutting lands through which the line runs. I do not believe it would be possible to make a contract to purchase the right of way for the figure I have named; I think my figures are pretty low, generally.

I am familiar with appraisal of lands in 1900 state appraisal; Soo Union Depot Co. Terminal was constructed, and land for it acquired, since 1900. I appraised at Soo, to both companies, 164.31 acres at $304,042; one-half assigned to South Shore. Cooley appraised to South Shore there 84.88 acres at $118,832. My appraisal included Union Depot Co. property, and value placed was 28% more than Cooley's, which excluded that property.

(Map. Complt.'s Ex. 3, Riggs, and page 7, Ex. 1, show correction of statement of ownership, as between Soo Line and South Shore, on certain description.) This would not affect my figures, as I assigned one-half of all to each. I did not assume severance damages on terminal lands, at Soo or elsewhere, in any considerable amount; there

would be practically none at Soo, as most of the lands have been acquired by tracts, and where entire tract not acquired, remainder is left in such shape that there would be no damage.

20 The severance damages, expressed by percentage, would be generally less in cities and terminals, by reason of the smaller tracts, although in a majority of instances the entire lot or string of lots is acquired.

Mackinaw County and St. Ignace: (to extent that testimony is a duplication of Complt.'s Ex. 1, Riggs, it is not attempted to be repeated.) The right of way through town, valued at $5 per foot,—$21,000,—is made up of narrow widths, some town lots in whole or part, some narrow right of way and some wider tracts. The line runs immediately adjacent to the business houses on Main St., and in close proximity to a number of residences. I placed those values without consultation. Have been in St. Ignace 3 or 4 times since, and am satisfied that the figures are too low, and that the property would not be acquired for that figure.

I do not think $50,000, excluding gravel pit, as placed in St. Ignace, is far out of the way for a value, exclusive of severance damages, which, by reason of the way town is built along railroad, would be very high. From observation since appraisal, I am satisfied my figures are low, 50 to 100%, and that they ought to be increased.

(Complt.'s Ex. 4, Riggs, map of St. Ignace, scale 200 feet to inch.)

Page 13, Complt.'s Ex. 1, Riggs, country land, Marquette county, to mile post 150. It is practically all timbered land. Item right of way, mile post 150 to 152, less than 100 feet in width, 15.5 acres, at $50 per acre. That is right of way of varying widths; some of it is quite narrow, in quite a narrow strip or shelf of land between the bluff and the lake. The price I placed, I am satisfied, is far too low. Assuming the removal of the railroad and restoration of the land to original tracts, it would be extremely difficult to secure a right of way in this narrow strip of level land, that is

21 specially fitted for railroad purposes, and good land under cultivation; there are a number of dwelling houses all the way through it, and I am satisfied it would be extremely difficult to reproduce that few miles. From mile post 150 to where the track enters Lake St., Marquette, the right of way is located in a narrow strip varying from 200 to 400 feet wide, between the lake and hills, which is substantially level; there is no other outlet to the east of Marquette, for a railroad.

The strip gets narrower as the line goes west to the point where the strip runs out in the water front of Marquette. The M. & S. E. is also in that pass, being the only other road going east from Marquette. It is not practical for the city to be entered from the east, as by a railroad built with such grades as could be operated to take any other route except at a tremendous increase cost, over any other route.

(Complt.'s Ex. 5, Riggs, map of Marquette and vicinity, scale 2000 feet to inch.)

The three items, Complt.'s Ex. 1, page 13, Marquette county line to point where track enters Lake St., I don't believe could be reproduced under those conditions for less than $20,000 to $25,000.

(Complt.'s Ex. 6, Riggs, map of Marquette, 300 feet to inch.)

Item, water front, Burt & Ely's Add., 1,100 feet, at $35, $38,500. This strip is 50 to 80 feet wide, from water front back, lying between Lake St. and the lake.

Item, water front, inside Marquette harbor, 2,200 feet, at $75, $165,000; that is water front from opposite the end of Jackson St. to opposite the end of Washington St., on which is located ore, merchandise and coal docks of company.

22 I don't believe that, assuming the two properties not now used for railroad purposes, but vacant and unimproved, they could be acquired for less than $200,000 to $210,000. I placed my estimate at a uniform price per foot, and did not undertake to separate into small tracts; probably some of the property in the first description might be acquired for less than the sum named. I am of the opinion that part of the main water front is much more valuable, and I don't believe that the two tracts of water front taken as a whole, can be acquired for less than the figure named in my appraisal. I consider that to be the fair present value.

Item, water front, outside harbor, south of south line of Ely lot, 850 feet, at $30 per foot, $25,500.

Item 4, frontage west side of Lake St., north line of Ely lot to Jackson St., 1,000 feet, at $60 per foot, $60,000.

In my opinion, that property is worth $50 a front foot on Lake St., on account of its depth and location.

Item 5, page 13, frontage, west side of Lake St., north line of Ely lot to Baraga Ave., 1,110 feet, at $30 per foot, $33,300.

A lower valuation was placed by reason of shallower depth. The last two items were valued in Cooley appraisal at $71,740, being $34 a foot, while my aggregate is $93,300. I don't believe it could be acquired for less than I have named, but it might be worth more.

Item 6, page 13, frontage, west side of Lake St., Jackson to Mesnard, 565 feet, at $20 per foot, $11,300. The fair and reasonable value of that property, excluding improvements, is not less than $20 a front foot on the lake.

23 Item 8, page 13, 46 50-foot lots between Mesnard & Hampton streets, at $100 per lot, $4,600. I don't believe it would be possible to acquire those lots for less than $100 to $150 each, and believe their fair value not less than that.

Item 9, page 13, 12 50-foot lots west of Division, at Hampton, at $200 per lot, $2,400. Worth not less than $2400.

Item 10, page 13, 12½ 50-foot lots, Jackson to Mesnard at $400 per lot, $5000. Worth not less than $5000.

Item 11, page 13, 336 feet frontage on Lake St., Baraga Ave. to Washington St., at $50 per foot, $16,800. Worth not less than $50 per foot.

Item 12, page 13, 343 feet frontage on Front St., Baraga Ave. to

Washington St., at $450 per foot, $154,350. This covers end of Depot yard, two under crossing, and one over crossing. It is in the most valuable part of the principal business street of Marquette. I doubt whether it could be acquired for $450 per foot, if privately owned and not devoted to public use.

Item 13, page 13, 184 feet frontage on Front St., south of Baraga Ave., at $200 per foot, $36,800. Worth not less than the figure named.

Item 14, page 13, 445 feet frontage on Main St., Front to Third St. at $60 per foot, $26,700. Worth not less than the figure named.

Item 15, page 13, 14,608 square feet on Front St., 3rd. St. to
24 Washington and Main, at $2 per square foot, $29,216. Worth not less than $2 per square foot, and if privately owned I don't think it could be acquired for that sum.

Item 15*a*, page 15, 100 feet frontage on Baraga Ave., at $50 per foot, $5,000. I don't believe that it could be reproduced for that, and the actual cost to the company was far in excess of that sum.

Item 16, page 15, 150 feet frontage on Spring St., at $50 per foot, $7,500. That is an item on which there is a very large measure of severance damages; it extends diagonally across lots 15, 16 and 17 of Block 3, and takes the front off 3 lots on opposite side of street. I don't believe it could be reproduced for less than $7,500 to $10,000, and believe that its value is no less.

Item 17, page 15, 21 lots, Third St. to Fifth St., at $500 per lot, $10,500. Value not less than $10,500; probably would cost more to purchase for railroad purposes.

Item 18, page 15, 60 lots and shop grounds, Fifth St. to Park Ave., at $500 per lot, $30,000. In my opinion, worth not less than $30,000 for platting for other than railroad purposes; if railroad not there, do not believe it could be acquired for less than $40,000 to $50,000.

Item 19, page 15, unplatted lands south of Nester's Add. and west of the shops, 34 acres; estimate based on 6 lots per acre, at $150 per lot or $900 per acre, $30,000.

Item 20, page 15, south of Nester's Add. and west of the last above described tract, 36 acres, at $1,000 per acre, $36,000. Both these tracts are immediately adjacent to, and south of, a good resi-
dence part of the city; were the railroad not there, it is de-
25 sirable for platting. I placed a value of $150 per lot on 34 acres, though I am satisfied it would be worth more than that for other than railroad purposes. Its being strategically in a valley, and its proximity to shops and other property of the railroad, make it especially desirable for railroad property, and I would consider it worth more than I have placed upon it for railroad purposes.

36 acre tract is generally the same kind of land; it is higher, lays better for platting, though more remote from center of city. I stated $1,000 per acre on the basis of value for platting.

Taking both parcels in 70 acre tract, if privately owned, vacant and unimproved, taking into account its situation and considerations of strategy referred to, I don't believe it could be acquired for less than $1,200 to $1,500 an acre in the tract.

Item 21, page 15, industrial sites at end of Dead River Railroad, in North Marquette, between L. S. & I. ore docks and iron works, 151.35 acres, at $200 per acre, $30,270. The next description is the right of way leading to this.

Item 22, page 15, Dead River railroad right of way, 30 acres outside of platted part of city, at $200 per acre, $6,000. Fair value not less than $200 per acre.

Item 23, page 15, right of way, north line to city limits, 6.8 acres, at $200 per acre, $1,360. Worth not less than $200 per acre. The north line could not conveniently be placed on other land because of extremely heavy grades. If not now devoted to railroad uses, I don't believe it could be acquired for less; it might cost more.

26 Item 24, page 15, right of way, south line, Hampton St. to mile post 1, 16 acres, at $200, $3,200. This right of way runs diagonally with respect to section lines. Worth not less than $200 per acre, and I question whether it could be reproduced for that.

Item 25, page 15, right of way, north line, city limits of Marquette to limits of Negaunee, 79 acres, at $150, $11,850. Worth not less than $150 per acre; the absolute title, such as plaintiff has, I don't think could, particularly in westerly end, be acquired at any price, because affected by mineral rights. At present, all the sales reserve the right to occupy the land and right to mine. The mining results in caving down the surface, and necessitates the removal of the railway tracks and structures. If possible to support the surface, it would entail such expense that no mining company would undertake it. As ore is removed, the surface of the ground caves. In 1910, Negaunee Mining Co., desiring to remove ore under right of way of South Shore, acquired a new right of way in fee, and built 2.1 miles of new railroad for plaintiff. That was a matter of bargain, as old South Shore right of way was perpetual. This was so mining company could cave in old route.

Item 26, page 15, right of way, south line, limits of Marquette to limits of Negaunee, 96 acres, at $100 per acre, $9,600. It is in mining district, but major part not so much protected by mineral rights. The value not less than $100 per acre, and very doubtful in my opinion if it could be reproduced for that.

Item 3, page 13, water front, outside harbor, south of the south line of Ely lot, 850 feet, at $30 per foot, $25,500. Present value not less than $30 per foot, measured along streets, parallel.

27 Items 1 to 26 inclusive, within Marquette, total appraisal, $773,296. Cooley 1900 appraisal did not include all the right of way or the 151 plus acres at North Marquette as in Marquette city. His total value in Marquette was $597,777. Upon the same lands, my valuation is $732,466, exceeding his by $134,698, or approximately 22.5%.

In my opinion, land of plaintiff in Marquette city is worth not less than $800,000 to $850,000. If such land were not already devoted to railroad uses, but was vacant, privately-owned and unimproved, it could not be acquired by purchase or condemnation for less than $800,000 or $850,000.

Item 27, page 15, city of Negaunee, north line, mile post 163 to mile post 164 plus, 2,800 feet new line, 2.6 miles, near Negaunee Mine, south line, mile post 9 to mile post 12. Total acreage, 86 acres, at $2,500 per acre, $215,000. My estimate of value was based on the assumption that company had perpetual right to maintain the tracks. Fair present value not less than $215,000, or $2,500 per acre. Practically the whole of this item is in mining district, underlaid with ore mines and immediately adjacent to improved mining property. If not now in railroad use, but vacant, unoccupied and unimproved, I don't believe the land could be secured at any price. I don't believe a perpetual right of way (without the fee) could be secured at a much greater cost than the $2,500 per acre estimated.

I have made special inquiry as to amount paid for lands in vicinity of Ishpeming and Negaunee, and conditions surrounding the railroad lands there. I have been given access to information and actual cost of land acquired for railroad purposes there; have been over the territory several times, and have seen conditions that existed there on D. S. S. & A. and other railroad properties.

28 Item 28, page 15, in Negaunee City, to mile post 167 on main line, total acreage, 29 acres, at $3,500 per acre, $101,500. Fair value of this description, without mineral, not less than $3,500 per acre. If the land vacant, unoccupied and unimproved, in my opinion it would be impossible to acquire such rights as are now possessed by plaintiff for less than $110,000 to $150,000. This is all main line right of way.

Item 29, page 15, track rights in Negaunee, main line, 8,700 feet, at $5 per foot, $43,500.

Item 30, page 15, branch, 7,300 feet, at $1.50 per foot, $10,950.

Item 36, page 15, Winthrop Branch, 23 acres, at average of $300 per acre, $6,900. The acreage given is that owned on the entire branch. Most of the sidings and spurs are on lines of mining company, but most right of way on the branch itself is owned. I do not include right of way for branches, sidetracks or spurs upon the lands of others which are not owned. In sidetrack item, I have made no allowance for land upon which sidetrack is located, nor in item right of way do I include land in any case, where the track is located upon the lands of others.

(Complt.'s Ex. 8, Riggs, map of mining district, including Ishpeming and Negaunee.) This shows the location of the principal mines and railroads of other companies.

Item 37, page 15, Mary Charlotte Branch, 3.2 acres, at $100 per acre, $320. My opinion is that it is worth at least price given.

Item 38, page 15, Palmer Branch, 34.4 acres, at $100, $3,140. Worth not less than price given. If vacant and unimproved, it would be impossible, at figure I have named, to acquire rights

29 for permanent main line railroad. To acquire such rights as usual for mining spurs would cost not less than amounts named for last three items, namely, Winthrop, Mary Charlotte and Palmer branches. By rights used for mining spurs I mean the right to lay a track subject to right of mining company to order removal

on short notice. That is not the condition of these lands; most of them are ownership of right of way. There are some grants su' ject to right of owners to have tracks removed, but not many.

Item 39, page 15, Ishpeming limits to mile post 173, 168 acres, at $250 per acre, $4,200. Company has fee simple title. Value not less than $250 per acre; it would cost not less than that to acquire at present time if not used for railroad purposes and unimproved.

Item 40, page 15, mile post 173 to east end of Humboldt yard, 100.8 acres, at $75 per acre, $7,560. Worth not less than $75 to $100 per acre. That right of way would exceed in cost to purchase, if vacant, unoccupied and privately owned, $100 per acre average, on account of mineral rights, character of soil and availability for agricultural purposes. As respects section lines, the line here is irregular, paralleling section line one-eighth to one-fourth mile distant and angling across one section.

Item 41, page 15, Humboldt, 18 acres, at $500 per acre, $9,000. I estimated 18 acres in use for railroad purposes, or so affected by location of railroad as to be useless for any other purpose and necessarily a part of right of way. $500 an acre is my judgment of reasonable value, taking into account immediate proximity of mines and its use as a railway junction.

(Complt.'s Ex. 9, Riggs, map of Champion.)

30 Item 42, page 16, Humboldt to Champion, 36 acres, at $40 per acre, $1,440. The country is more or less affected by possible mineral deposits, with timber on much of it. I believe estimate of $40 per acre radically low, and that it would be impossible to reproduce this right of way for any such figure, or less than $50 to $75 per acre, which is my opinion of its value.

Item 43, page 16, Champion (including branch), 18 acres, at $350 per acre, $6,300. Value of this 18 acres affected by fact that it is immedately adjacent to mining village and that all land through there is affected by known mineral rights. This right of way is perpetual, and fair present value is not less than $350 per acre; impossible to reproduce through Champion for any such sum, but would cost considerably in excess.

Item 44, page 16, Champion to Michigamme, and Michigamme to county line, 84 acres, at $25 per acre, $2,100. Main line from mile post 186 to 193.66, except strip between mile post 192 and 193, through village of Michigamme. For a distance of 2 or 3 miles east of Michigamme, the feasible railroad routes are limited to a strip of country 600 or 800 feet wide. I am convinced the $25 per acre is too low, and that the property could not be reproduced for less than $75 to $100, on the average; that item ought to be increased to extent indicated.

Item 45, page 16, Michigamme, 8 acres, at $350 per acre, $2,800 between mile posts 192 and 193. My appraisal influenced by the fact that Michigamme is on both sides of road, which at that point is along shore of one of the most beautiful lakes in Upper Peninsula, and by mining developments at Michigamme. Because right of

way is near lake shore, it is of greater value than otherwise.
31 Worth not less than $350 per acre, and if railroad were not there, and it were vacant and unimproved, that would be fair purchase or condemnation price.

Item 46, page 16, Republic Branch, county land, 94 acres, at $25, $2,350. I am of opinion it could not be purchased at $25 per acre fixed, but do not know of extent to which lands, Humboldt to Republic, are affected by mineral values. There are mines at both ends of branch.

Item 47, page 16, in Republic village, 8 acres, at $1000 per acre, $8,000. The value is not less than $8,000, and if vacant unoccupied and unimproved, it could not be acquired by purchase or condemnation for less.

When getting the land values of country lands through the state, the severance damage varies, making the cost to the railroad of right of way lands from two to four, or more times the sales value of the land for other purposes. That was recognized in the Cooley appraisal for taxation.

In the Cooley appraisal, the multiple used was two or three times the market value for other purposes, as a basis, and to this figure was added a fixed charge of so much per acre to cover cost of acquisition and investigation of title. In my opinion, from two to four and a half times should be added. In my profession, it is a recognized practice to use such a multiplier. The general practice in valuation has been to use a multiplier varying from two to three and a half, and in Wisconsin and Minnesota these multipliers have been from two and a half to three and a half intending the figures to be approximate. The practice was first used by Professor Cooley, in 1900 valuation.

Item 55, page 15, Houghton Terminal, 12 acres, 1,550 feet, of water front, with riparian rights, ranging in depth from 150
32 to 350 feet; 1,500 feet, at $35 per foot, $52,500. The land, with the exception of a strip along the line furthest away from the water's edge, is level. There is a bench between the foot of the bluff and the lake. The question of strategy was not especially taken into account. It is the only possible entrance for a railroad line into Houghton from south. I don't know about going into Houghton from the west, along Portage Lake. The fair value, in my judgment, is not less than $35 per foot, and possible much more for any commercial purpose.

Item 56, page 16, first mile out of Houghton yard, along shore of Portage Lake, at foot of bluff, below State School of Mines, and residence district, 12.8 acres, at $2,500 per acre, $32,000. All of the land on this mile available for right of way purposes is confined to a narrow strip of which this is a part, at some places not to exceed 150 feet wide, and in no place over 250. Fair present value based on reproduction, not less than $2,500 per acre. Assuming that the land were privately owned, it could not be acquired for less than $50,000. This item and the last preceding could not be reproduced for $85,000 and possibly exceeding $110,000.

Item 29, page 15, track rights in Negaunee, main line, 8,700 feet,

at $5 per foot, $43,500. Corrected to 8,710 feet. I reached valuation of $5 a foot on theory that it would be impossible to secure a lease or grant to maintain a single track through the same territory for less. I regard track right as equivalent of independent ownership of the right to build and maintain one track.

Item 30, page 15, 7,300 feet, Teal Lake Branch, at $1.50 per foot, $10,950.

33 Item 31, page 15, track right to Milwaukee Mine, 9,120 feet, between Negaunee and Ishpeming, at $1.50 a foot, $13,680.

Item 35*a*, page 16, 1,000 feet main line, title by prescription omitted, 1.52 acres, at $3,500 per acre, $5,320. (Added in Ex. 50, Riggs.)

Item 32, page 16, south line, 12.77 acres, at $1,000 per acre, $12,770.

Item 33, page 16, city of Ishpeming, south line, in city, 38.2 acres, at $2,500 per acre, $95,500.

Item 34, page 16, north line eastern part of city, 9.6 acres, at $3,000 per acre, $28,800; western part of city, 7.7 acres, at $3,500, $26,950.

Item 35, page 16, through central part of city, narrow right of way. Track right and extra lots 5,000 lineal feet of track, estimated at $30 per track foot, $150,000.

If items 29 to 35 were privately owned, vacant and unimproved, it would be impossible to acquire rights to get such tracks and lands as the company has through that territory for less than $150,000, and possibly very much in excess of that.

(Witness produced copy of Cooley 1900 appraisal, and makes the following comparisons of land values:)

34–35

County.	Riggs.	Cooley.
Alger	$18,838	$2,539
Baraga	131,062	27,495
Chippewa	211,082	120,421
Gogebic	34,300	1,766
Houghton	133,600	46,067
Luce	24,173	6,695
Mackinaw	64,551	13,034
Marquette	1,541,927	677,848
Ontonagon	53,880	2,184
Schoolcraft	8,510	1,799
Total		$899,848

The Cooley appraisal showed 274.17 acres of farm land for plaintiff, at average of $26.16 per acre, and 4,623.2 acres barren land at $2.50 per acre, and 268 acres in cities and villages at average of $182.29 per acre. In Ishpeming and Negaunee, Cooley's value was $71,067, as against mine of over $667,000.

(Abstract from Cooley appraisal marked Complt.'s Ex. 11, Riggs.)

Schedule 3, Grading, Complt.'s Ex. 1, Riggs, page 2. The details are found on pages 33-36 of Ex. 1. This item includes clearing, grubbing, grading channels, shrinkage, overhaul, corduroy, construction, retaining walls, rip rap and sea walls, $2,879,484.

36–42 Nothing included for grading, clearing or grubbing sidetracks, which is included in item of sidetracks. Have followed I. C. C. classification of construction accounts in general, except that I have introduced new schedule, "Sidetracks," in which is included all cost of sidetracks at a price per running foot.

In computing 1911 earthwork yardage, I used as my basis the 1900 appraisal figures, checking against profiles in several instances and making full notes on inspection trip for classification of earth and other materials. The 1900 earthwork yardage arrived at by engineers inspecting the road, profiles, maps and records; this done under my direction. Computations were made, 1900, of earth yardage as taken from profiles. I have found these computations substantially correct. In 1900, there were no allowances in addition to bare profile quantities. Since 1900, there have been changes in mileage.

An increase of yardage is made due to bridges, trestles and open cattle guards filled and small work widening fills. In Cooley appraisal the Republic Branch was omitted from grading. Cooley appraisal makes no allowance for solid rock excavation, Michigamme to state line, and not sufficient allowance for rock, Michigamme to Marquette.

43 Page 4 of Complt.'s Ex. 1 shows the mileage taken into account in grading, on pages 33-36. I accepted the total yardage of Cooley appraisal as starting point; there, there was no allowances made in addition to profile quantities for shrinkage, for which it is customary to add 10% to care for settlement of fills. I added 10% for shrinkage, to take care of settlement and error due to the absence of actual cross-section notes and use of profile measurements.

There are only two classifications in Cooley appraisal, solid rock and earth. I have divided loose rock and hard pan ,and re-divided Cooley quantities among the four. Shrinkage added is 10% of all yardage; that is, yardage of pay earth, and not combined yardage of all cuts and fills. Overhaul added; the free haul distance adopted by me was 600 feet; the customary distance varies from 500 to 700 feet.

Cooley appraisal allowed nothing in grading for overhaul, shrinkage, grading crossings and station grounds, etc., probably because of short time for work of appraisal; they were included for some roads. Considering the fact that Cooley appraisal was done in three months, it was a wonderful piece of work, but in many instances it contains omissions. I arrived at figures for overhaul, grading crossings, etc., by the use of a percentage, varying from 6 to 9, of the earth yardage, fixed by inspection and judgment.

In Cooley apraisal, I do find four items of loose rock; the Cooley appraisal included the jointly-owned mine tracks in Republic yards.

The yardage totals are given as follows:

14

District.	Yards.	Average per mile.
Soo to Marquette	2,063,010	13,410
Soo Junction to St. Ignace	449,722	10,466
Marquette to Houghton	2,732,596	21,640
Nestoria to state line	1,880,218	18,130
	7,125,546	16,690

The average of 16,690 yards would be equivalent to a 16 foot roadbed, 1.5 to 1 slope, level cross-section, 4 feet high. The yardage for embankment of various heights would be, 4 feet, 17,160 yards, 6 feet, 29,300 yards, and 8 feet, 44,000 yards, per mile. Generally, the embankments are full width; in many cases, especially in marshy or low ground, the banks are wider than standard, 16 feet. Cuts are also wider than standard, due to the fact that they have assumed the angle of repose and have been cleaned out, as the material sloughed down. Generally, the fills have been replenished and brought up to full standard width and have assumed, in the main, the angle of repose and become covered with a growth of grass.

From my observation, I have been able to form an opinion as to whether or not on the average the yardage in the road is as much as stated. This is independent of computations. My opinion is that a re-measurement and re-cross-section of the road would show actual yardage per mile to be:

Soo to Marquette	14,000 to 15,000 yards.
Soo Junction to St. Ignace	12,000 yards.
Marquette to Houghton	25,000 yards.
Nestoria to state line	20,000 yards.

On an old road like this, it is not possible by inspection of the ground to ascertain the number of yards moved and put into the banks; at a number of points, there are soft ground and sink
45 holes, or swamps, where the earth would settle and would not be discernable or capable of measurement. Approximately 25 to 28 miles east of Marquette show evidence of having been corduroyed, which would naturally and normally settle. The records of plaintiff would not show what has been done by way of fills since road was built. The records are very incomplete as to work done between original construction and 1895, in putting on earth, raising fills or widening banks. The original construction records are on the profiles, which would not show the amounts of yardage paid for.

The unit price for grading was, in my judgment, fair and reasonable, and it would fairly and reasonably cost that amount to do the work at the present time, or last year. Cooley prices in 1900 were, 25¢ per cubic yard for earth grading, 60¢ for loose rock, and $1.25 for solid rock. Wisconsin appraisal of 1908 uses the same figures as Cooley appraisal. Prices from other appraisals are as follows:

Appraisal.	Earth.	Loose rock.	Solid rock.	Hard pan.
Minnesota Appraisal, by Morgan.....	27c.	50c.	$1.20	
Cooley Appraisal, 1900	25c.	60c.	1.25	
State of Washington Railway Appraisal, by Gillette	25c.	50c.	1.10	42c.
Wisconsin Appraisal, 1908.....	25c.	60c.		
Northern Pacific Appraisal, Minesota, by Darling	28c.	50c.	1.10	42c.
Great Northern, by Hogeland.....	27.75c. to 31.5c.	55c.	1.25	45c.
D. S. S. & A. Construction, Branch and Sidetrack (1910)	22c. & 40c.	75c.	1.35	50c.

The contract prices would be very materially affected by the local conditions surrounding the work, the ease with which a company could secure teams and men, whether the contractor who had
46 taken the work would have to ship his equipment a long way from settlements and board them himself. In Wisconsin, Michigan and Minnesota the prices would be about the same. In Wisconsin and Iowa, it would be easier to secure men; the element of shipment of the entire force a long distance to do the work does not come into the computation in Iowa, as in Michigan or Wisconsin, along South Shore. The local labor supply ought not to be a great factor in these states, except in team work; the local supply of teams would affect the conditions of railroad construction.

There has been a general increase in labor prices of about 15% between 1900 and 1911, and an increase in materials ranging from 5% to 100% on timber of various kinds; 1911 and 1912 prices are somewhat lower than 1909 and 1910, but the general tendency is upward. When prices went down in 1909 and 1910, they did not go as low as they had been in previous years. The inventory of schedule 3 is, according to my best opinion and judgment, true, correct, and as complete as I can make it, and the cost of reproduction as of June 30, 1911, or 1912, would be not less than $2,879,484.

Failure to depreciate earthwork and grading is due to the fact that the work is worth as much as cost to produce, new, a like structure. The cuts and fills on this road are in a condition today of absolute stability due to settlement, due to the fact that all of the erosion by water, and various other forms of sloughing and settlement that will take place, have taken place, and that many, or I may say most, of the embankments and slopes of cuts have become sodded over. The roadbed of plaintiff is in very much better condition today than a new, green, unseasoned roadbed would be. There will be no settlement, and the expense of maintenance is very materially less on an old, well seasoned roadbed that has become thoroughly
47 adapted to conditions of drainage that are formed or created by the construction of roadbed. In my judgment, the cost of track maintenance would be increased, on an average, by the addition of two or more men per section for the first six or seven years, to take care of the work of cleaning out of cuts and of replacing earth around embankments that had sunk down or been washed away.

I used the prices and information I secured in the offices here as

an aid in arriving at fair unit prices to apply to a general reproduction estimate. In many instances, prices paid for small quantities of material were considerably in excess of my unit prices; this is true, also, in the matter of labor contracts for grading, rock and loose rock.

Schedule 6, Ties, Complt.'s Ex. 1, Riggs, pages 144 to 146. The average life of ties in this territory is: Cedar, 10 to 12 or 13 years, tamarack, 9 to 10 years, hemlock, 8 to 9 years, and oak, 8 to 10 years. Some years, the conditions of work will be such on the road that renewals that can be left are allowed to run for a year, and renewals the following year will be heavy. Sometimes this deferred maintenance will run two or three years, with only necessary renewals, and then larger renewals will be made. Generally speaking, tie renewals are above normal from year to year, and from one-eighth to one-tenth of the main line ties will be renewed each year, depending on the kind of ties, and the local conditions.

I found that the company had made tie purchases for 11 years ending June 30, 1911, as follows: 279,316 cedar, 921,160 hemlock, 341,649 tamarack, 111 oak, 582, pine, 1,688 ash and 70,846 culls.

48 I have applied a present condition of 60%, throughout, as being representative of the present condition of the ties, as compared with new ties.

Ballast, including cost of material, loading, transportation, unloading and placing in track of ballast for main line, $646,898; present physical value, the same amount.

Q. While we are on the subject, does ballast depreciate in condition?

A. If a road is ballasted and no further work of ballasting is done upon it for many years, I would answer your question yes, but if, as is the usual railroad practice, the ballast is renewed from time to time, additional ballast being placed upon it, the amount of ballast under the track becomes very largely increased, the drainage improves from year to year, and the ballast, as far as the condition is concerned, remains at substantially 100% condition, and in my opinion this item should not be depreciated in the case of a road which is keeping up with the renewals of ballast and the addition to the quantity of ballast.

The fact is that the road is a well ballasted road; between Marquette and the Soo and St. Ignace, Marquette and Houghton, and from Nestoria to the state line, there is a large amount of ballast and considerable recent work has been done, but a year ago there was a considerable mileage between Nestoria and the state line that was in need of additional ballast.

I should call the road a well ballasted road wherever gravel and sand has been applied; at other points, I have used the price of sand ballast.

48*a* In my opinion, the ballast that is now on the road in Michigan could not be reproduced for less than $646,898, and that it is worth today that sum of money.

I do not believe it would be possible to reproduce the ballast that is on the road today, as it has been placed piece-meal, with most of the material loaded by hand and not by steam shovel, for anything like the figure that I have estimated.

The item of track laying and surfacing has not been depreciated at all. I regarded the same as a labor item. I have treated this item and the ballast item in the matter of depreciation exactly upon the basis of Mr. Cooley in 1900, in that no depreciation was made, upon the ground that they were a cause of creating property, and as long as the property was in use and as long as large sums of money were annually spent for the maintaining of those elements—in the highest condition of efficiency, was the word I was hunting for—that it is not proper to figure a depreciation.

The Mackinaw Transportation Co., listed under schedule 34, Ferries and Steamships, is a corporation engaged in running a car ferry line between St. Ignace and Mackinaw City. One-third of the stock of this corporation is owned by the plaintiff and the other two-thirds by the Michigan Central and the Grand Rapids & Indiana. The company is not operated for profit, and each company pays an equal proportion of all the expenses connected with its operation. Its property consists of certain ferry boats, which are listed in the schedule, and one-third of their value is assigned to plaintiff.

48*b* Engineering on roadway and structures, including salaries, expenses, supplies and transportation of engineers, inspectors and architects, and fees for inspection of material and machinery, fixed at 4% of items 1 to 28 inclusive; 4% on $12,187,742 equals $487,510. Fair present reproduction value and the present physical value are the same.

There has been no allowance elsewhere covering cost of making plans, inspection or superintendence on any of the foregoing schedules. This work includes preliminary surveys, location of line, engineering on construction, and incidental inspection, plans, superintendence of construction, and inspection of bridges and other structures. This is item 1 in I. C. C. classification.

49 It is customary, and has been for many years, to include in all estimates of cost for new construction a percentage allowance to cover the item of engineering, and it has been customary and usual in appraisal practice to make an allowance for engineering based upon a percentage of the roadway and structures items substantially in every appraisal, the same items that I have included in this group, in arriving at this percentage.

In Cooley appraisal, the same percentage, applied to the same items, was used, except item 27, Electric Plants, new since Cooley appraisal. The 4% is an average; it might be very little on some items, and higher than 4% on others. The average was arrived at by making a careful study of the actual engineering percentages of work done under me and by me for the last 12 and 15 years, and comparing my own experience with the experience of other engineers, and by the use of a figure which I believe to be a fairly conservative one, to represent this expenditure.

I believe this is as accurate a way of getting at proper charge for engineering as to take each item separately at its own proper percentage, as it would be almost impossible to keep separate accounts of, or to compute a proper allowance for, engineering. For certain items—for example, in the roadbed item—there is a large amount of engineering that is not directly assignable to any one of the elements that go to make up that item; there is no way to accurately ascertain the engineering charge on any particular item, 1 to 28.

You must find out what the engineering of a railroad would amount to, and that includes not only the design and superintendence of your buildings and your bridges, but it also includes very large expenditures for preliminary surveys and for location surveys, and for soundings and borings and other work to determine the area of water ways and the character of foundations to be used; that cannot be definitely assigned to any of the items making up the cost of the road. Ordinary engineering accounts are kept as engineer-
50 ing, and all of the elements on engineering expense are kept in one general account, and not assigned to any specific structure.

The 4% is an estimate based upon the comparison of actual engineering percentages in a large number of cases. It represents my opinion; that figure represents the concensus of opinion of the engineering profession of the percentage as to the fair and reasonable allowance. The manner of the application of it is in accordance with engineering practice. The amount of the percentage varies considerably in construction estimates based upon the character of the construction that is about to be undertaken.

There is a decided concensus of opinion as to the propriety of using 4% on properties of this kind in valuation work, applied to the items to which I have applied this. The percentages used in construction estimates on railroad work vary from 4% to 7.5%, averaging 5%.

Engineering on equipment, including all engineering salaries and expenses connected with the purchase or construction of equipment, fixed at two per cent of items 30 to 34 inclusive; 2% of $2,946,193 equals a fair reproduction value of $58,924; present physical value the same.

The item did not appear in any of the Cooley appraisal in Michigan. It was added because it represents an expense to the railroad in connection with the inspection, breaking in and testing of equipment. The 2% was placed after conference with Messrs. Saddler and Anderson and based upon their experience, and information
51 secured by Mr. Anderson and myself as to the value and cost of such work in connection with other railroads. In work in New York, last year, we were able to determine the exact cost of that item, as far as locomotives were concerned.

There, the cost of preliminary engineering, specifications, inspection and cost of breaking in ran over 2%—almost 3%. My own experience permits me to state with positiveness only in the matter of steam shovel and other construction equipment, where I have known the cost to run from 1.5% to 3.5%. In such equipment, it is neces-

sary to pay for the time and expense of a man sent by the manufacturing company to assemble, test, put the machine in order and give it a trial run, which is additional to price paid by purchaser.

Locomotives are not fully assembled, and considerable work, in the way of assembling the various fittings, must be done; it is the practice on railroads to break in locomotives, taking, sometimes, several weeks. On freight cars, it would be less than on items of machinery. On passenger equipment, it would be in part due to minor equipment purchased for cars. On work equipment, my percentage is fair to represent bona fide expense, and would necessarily be expended in reproduction.

The item of contingencies is one that is added in all cases of valuation, to cover those elements of cost of construction that are not disclosed by the inventory of the property, and those elements that are due to weather, strike and other causes that go to increase
52 the cost of construction or add to the unit prices that have been used in making up the appraisal estimate.

My percentage averages 7.9%. This item is, and has been for many years, customary in construction work, in the engineering profession. On ordinary construction work, involving all classes of road equipment and bridge work, percentages vary from 5% to 15%, and more, averaging fully 10% on all items. Engineering practices vary as to exactly how this should be added; some prefer to add a percentage to each item, varying from 5% to 20%, and some prefer to add an average percentage to the entire estimate.

Where percentage is applied to each item, there should be a general smaller percentage applied to undertaking as a whole, to cover elements of cost not covered in specific items. Contingency item is to cover unforeseen things or errors in inventory, and includes casualties, personal injuries, and loss by fire, flood and cyclone. In a property in existence for a number of years, it is difficult to procure accurate inventories, especially of masonry and concrete, yardage of grading, and other elements that go to make the completed property. The percentage is added, on the assumption that the estimate is always under. In practically every estimate of this sort, the serious errors have been errors of omission.

It might be possible to over-estimate, but in an estimate based upon profile quantities, as this is, the almost absolute certainty is that the error is of under-valuation, rather than an over-estimate. The profile fails to show swamp land, where settlement has taken place and additional earth has been hauled in, or earth for filling sink holes or swamps, or earth hauled in to widen embankments, or where cuts have been taken out by steam shovel work and material used
53 elsewhere. My contingency percentage is lower than in all Cooley appraisals, where 10% was applied to all items, including the overhead charges.

In every appraisal of railroad properties, a percentage has been included for contingencies, the amount of which has not been uniform. I have had frequent opportunity to observe the propriety of the percentage by comparison with actual results of work for which I made estimates. It has been my practice to allow 10% for contin-

gencies in all estimates for new work. I have never been employed on work where the element of contingency in some form did not enter into and affect the cost to such an extent as to wholly or largely justify the percentage used by me, of 10%.

In general, the problem of estimating reproduction cost is more difficult than estimating the cost of new construction of a standard property, as the estimate for the new property is based upon complete surveys and specifications, etc., and the contingencies should be limited to elements of unseen construction, such as clay soil, rock, hard pan, quick sand, swamps, sink holes and weather contingencies, and not upon the omission of things to be done, while in the case of an old property all these things enter in; the property has been built so many years that perfect history of construction cannot be secured, and many things are not found that were encountered in building the property.

In my opinion, a contingency allowance is proper and necessary; the amounts added are reasonable, and I believe that, if it were possible to determine the exact history of this property, it would be found that all, or substantially all, of the amounts named for reproduction cost of contingencies have actually been incurred in the way
54 of contingent expense. Without attempting to make a complete check of the property, I have noted the following items emitted from my appraisal:

(*a*) Riprapping along shore of Marquette harbor, which cost the company thousands of dollars.

(*b*) Riprapping along shore of Lake Michigan. (Hansel made a careful survey of riprap, and found a total on the line of $4,110.)

(*c*) Bridge crossing warnings or ticklers entirely overlooked, which would run into several hundred dollars.

(*d*) In some bridge estimates, masonry was based on pedestals shown upon plans; by photographs of the bridge received since the computation was finished, it is shown that there are a couple of hundred feet of masonry retaining wall connecting these pedestals, built as shore protection, and in other instances items disclosed by the photographs have been overlooked.

I believe a careful checking of all these schedules would disclose hundreds of items that might, or should, have been included in inventory.

Legal expenses during construction fixed at one-half of one per cent of items 1 to 37 inclusive; one-half of one per cent of items 1 to 37 equals $85,122, for the fair present reproduction value and present physical value.

On construction work I have been connected with, the element of legal expenses incurred throughout. Services of an attorney
55 are required pretty constantly during construction of roadbed across lands acquired; controversies with contractors are frequent, as are claims for damages to property of adjacent owners, by setting back of water, building new embankments, and fire, and on account of injuries to persons during construction. I have never seen extensive operations carried on where services of an attorney

were not almost as constantly in demand as engineers, though not in so large a force.

Engineers rarely include this item in detailed estimates, as it is an overhead charge, placed by general officers. It is a custom in valuation work. Legal expenses are rarely under direction of engineer. It has been customary, in all of the state appraisals and appraisals for railroad companies, to allow for legal services by a separate item, or to include a percentage for legal services with engineering. The item is usually expressed in a percentage of other items, as I have done, and a percentage of .5% has been most generally adopted in valuation work during the past 10 years; this was the percentage allowed by Michigan appraisal of 1900, applied, I think, though I am not certain, to substantially the same items—1 to 37 inclusive.

Organization, administration and general expenses during construction fixed at 2% of items 1 to 37 inclusive, $340,490.

This item is inserted to cover those expenses of construction which must necessarily be incurred in connection with the incorporation, organization, preliminary financing, and the administration of the property during construction period, and the general expense
56 covering clerical help, accounting forces, and other official and clerical organization, office rental, supplies and expenses incurred during the construction period and not otherwise provided for.

Nothing is included for discount, bonus or commissions, etc., but I have included a figure which I believe to be reasonable, to cover expenses that would necessarily and properly be incurred in the construction of this railroad. I don't know of a single instance where items of legal expense and organization, administration and general expense have not been incurred in large amount, and I do not know of instances where these items exceed the percentages named by me, very materially.

In Cooley appraisal of 1900, 2% was allowed for organization, administration and general expenses. Percentage for this item is customary in appraisal of railroad properties, and every such appraisal made by state or railroad authorities has included this item, and used from 1.5% to 3.5%, usually 2% or 2.5%.

Item 37 is a physical allowance. Items 38 to 40 are overhead charges, to which are sometimes added discount, commissions, general contractors' profit, etc., all of which I have excluded as not being proper in an appraisal of this kind.

Interest during construction fixed at 7.5% of items 1 to 39 inclusive, $1,308,757 set down in both the reproduction column and the present physical value column.

57 This is an allowance to cover needed expenditures for interest on capital invested in railroad during construction period and to the time operation of the property commences. To get at the amount, we must determine the time required to construct the property, and the rate of interest to be paid. I assume a rate of 5%, and that it would require not less than three years from commencement of operations to completion of the property, which would be 15%. I assumed interest on the whole amount for one-half the time, on the

idea that one-half of it would be idle for three years, the investment being made through that period.

I do not believe that it would be possible to build any portion of this particular property and put it in operation in advance of the whole property, assuming the reproduction of the entire property new, or that it would be profitable, or that it would in any way materially reduce the interest item. The cost of operation before completion would not only consume the revenue, but would seriously interfere with the construction. The bulk of the equipment would come on to the property in the last few months, while the major part of permanent way would be built in early part of the period. It is fair to assume that, on the average, money would be in use 1.5 years before the road is in operation.

In order to build the line in three years, it would be necessary to start simultaneously at a number of points and carry on the grading and bridging on substantially the whole line. My three years' estimate applies to the Michigan property alone. The South Shore line from Nestoria to Iron River took two years and eleven months to complete, and it took a year to extend the line from there to the west
end. Three years is as short a time as possible in which to
58 build South Shore in Michigan, with structures, ore docks
and terminals; construction of ore docks would take a year, or more.

In Cooley appraisal of 1900, 3% was allowed for interest during construction, with regard to mileage of road or character of construction; the same percentage was used in his subsequent appraisal, and in Wisconsin. The 3% was on the assumption that all the roads in Michigan would be built in short sections, requiring one year for construction and completion, at a 6% rate.

I am familiar with conditions governing the financing of railroad properties. In my judgment, it would be practically impossible for a new company, or any company not thoroughly established, and with the highest credit, to secure money for new construction at 5%. I believe it would be impossible for South Shore to secure the money for less than 6%, and then only upon selling at 20% discount. In recent years, most railroad engineers have included a percentage for interest, though previous to last few years it was not considered within engineers' province. The general practice of taking the full interest rate for half the period is the general method as practiced by myself, and, so far as I have seen it, in estimates of other engineers.

Stores and supplies, $277,904, to be apportioned, 82.5% to Michigan and 17.5% to Wisconsin.

This is the total of inventory on Auditor's books, June 30, 1911.
The totals for this item, as appearing on June 30. for the years
59 named, are: 1900, $253,052.46, 1901, $195,708.69, 1902,
$198,013.48, 1903, $225,196.83, 1904, $241,355.18, 1905, $247,443.24, 1906, $356,804.85, 1907, $285,921.00, 1908, $371,045.54, 1909, $270,812.32, 1910 $285,043.39, and 1911, $277,904.01. The apportionment between states is on a track mileage basis, being 82.5% Michigan and 17.5% Wisconsin.

Working capital:

This includes money and bills receivable. I accepted Mr. Delf's statement, that $240,000 was a fair average, and less than the average for the year. In my opinion, the amount is reasonable, being a little below what I would expect to find and less than I have found in roads of similar mileage in other localities.

In my opinion, the fair present reproduction value of the property of the D. S. S. & A. in Michigan, including the car ferry, Chief Wawatam, and including stores and supplies and working capital, is not less than $19,199,105, and the present physical value is $16,-132,083.

In placing land values, I have assumed that the company would reproduce the title now owned by it; with but few exceptions, it owns the land in fee simple. I think I pointed out the cases, except in case of right of way, where there is considerable right of way occupied, fenced and cleared, to which I can find no title by deed; this is between 300 and 400 acres, out of a total of 6,000. I make no difference in estimating the value of these and other lands. My
60 valuation rests almost entirely upon the idea that the estate of the company is in fee simple, or its equivalent, with the exception of the few cases noted, mainly in Marquette County.

In mineral districts, I attributed nothing as an element of value to the fact that mineral was in the land, except that the cost of securing lands in some parts of the territory would be made more difficult and expensive. I have not included any value under the land, or any possibility of value, by reason of use or sale of mineral rights. The fee simple title which I value is the perpetual right to maintain the track and right of way, and use the land for railroad purposes.

It was the perpetual right to use, with the reversionary clause in case of abandonment of use, that I valued. In mining districts, where right of company is less than perpetual, and terminable upon conditions, I think that, in all such cases where I have placed a value, I have taken those facts into consideration, and they are reflected in the value placed upon the land. In certain instances, in Marquette County, I valued simply the right to maintain a single track.

(Complt.'s Ex. 12, Riggs, a comparative summary, showing total, by schedules, of Michigan appraisals of 1900 and 1905 and Riggs' appraisal of 1911.) There is a slightly different definition of some of the items, especially the trackage item, from which I separated 16, side tracks; the aggregates are the same. (Stipulation that figures of former appraisals may be used, subject to correction from original source.)

(Complt.'s Exhibits 1 to 13 inclusive offered in evidence, subject to objection detailed.)

61 (Complt.'s Ex. 14, Riggs, blue print pages, being index to rail and ballast record of tracks, and a sample page of rail and ballast record, Ex. 10, all introduced in evidence.)

(Complt.'s Ex. 15, Riggs, a blue print map of tracks and property of company from Negaunee east limits to Ishpeming west limits, scale 400 feet to inch.) This map heretofore referred to in my testimony.

My appraisal includes only physical properties with percentages added to cover overhead charges on elements of cost not capable of inventory, the expense of which is a part of creating the physical property. No allowance is made for good will or going concern value. No general contractor's profit, discount, cost financing, commissions beyond 2% for organization, administration and general expense, are included.

I did not attempt, in fixing the depreciation, to express any relation by that depreciation figure between the operating efficiency of the property as it is now and the operating efficiency of a new property. The figure rather represents the physical depreciation or loss of life, which should be in every case represented by a reserve created to take care of the renewals of the property, or to replace various units of the property when they come to the end of their life and have to be replaced by new units. Much of the property that appears with heavy depreciation in these figures is as efficient and capable of doing the same service, and is doing the same service, that new property would do.

I considered the property, taking into account its character, the service which it renders, its construction, and the country operated through, as a highly efficient and well maintained property of its class. It is well suited to render the service demanded of a railroad in its locality. While certain of the elements are depreciated,
62 such as ties, at 60%, they are as valuable to the public as though in 100% condition. What was said as to ties applies to other elements of the property which depreciate.

In my opinion, the property, as it exists today, as a unit, is more valuable as an operating tool than it would be if it were wholly new, by reason of the fact that on a new property the roadbed would be green, would settle, that the other elements of physical property all have to be tested out and large expenditures made upon them to remedy defects and bring them to a condition of operating perfection or safety, and all of the machinery and equipment would have to be broken in and would have to have considerable sums expended upon it before it would be in the condition of operating efficiency that the property is in today.

The operating expenses, exclusive of the elements of renewal, as they apply to the maintenance account, would be more in the case of a new property than in the case of this old one. This property is renewing the various elements that enter into it from year to year, and is expending new, each year, considerable sums of money in such renewals that would not take place in the case of a brand new property until after the end of the third or fourth or fifth year.

I would term a property as new during the first three or four years of its life, though the adjustment of buildings and breaking in of the equipment would probably come in less time, while solidification and settlement of embankments and fills, adjustments of drainage, and proper size of waterway openings, would take a longer
63 time.

I have made no allowance for appreciation of roadbed, embankments, bridges or structures, and have not included any-

thing for solidification or adaptation. Except as appreciation is reflected in unit prices of today, applied to structures built when work cost less, there is no element of appreciation in the appraisal.

Q. That leads us to the question of just what conceptions were the basis of your estimate of the reproduction new cost of this property?

A. I have conceived the elimination of this property and its reproduction new as of the past year, when applied to prices, assuming all other lines of communication now existing and all surrounding conditions remaining as they are at the present time. In other words, I have not taken into account hauling of materials through the woods for a distance of many miles, nor have I taken into account the extra cost, for instance, of pile driving by reason of the use of team drivers, horse drivers, but I have conceived that all other means of rail transportation and existing means of water transportation remained.

I include in my right of way estimate 15% for attorneys' fees and incidentals. I have never been able to estimate right of way high enough, except once, when I made a straight estimate of $5,000 an acre, at Negaunee; there, I was a little high. I have had some right of way work where I had no attorney's fees, and others where they were 50%.

On August 20, 1912.

RIGGS.

Direct examination resumed.

By Mr. Butler:

Since giving direct testimony, I have examined the transcript and been over the line of the road, accompanying engineers of the State on their inspection trip. I have made examinations of maps of one or two towns, and believe my testimony and exhibits should be corrected.

64 Complt.'s Ex. 1, Riggs, page 16, L'Anse, acreage previously stated, 45.2, at $1,500 per acre, value $67,800; this should be reduced to 32.1 acres, with value of $48,150.

Complt.'s Ex. 1, Riggs, page 17, Thomaston station grounds, previously included 60 acres, at $200 per acre, being the acreage of Cooley appraisal; on further inspection, I find actual acreage 20.5 acres, which would reduce value from $12,000 to $4,100.

Complt.'s Ex. 1, Riggs, page 208, wooden turntable at Republic, 50 foot, built in 1900, cost of reproduction, $2,750, and present value, $2,062; due to fact that this is an obsolete and inexpensive type of turntable, reproduction cost *now* reduced to $400, and present value to $200.

Complt.'s Ex. 1, Riggs, page 286, International Bridge, cost of reproduction, $314,864, and present value, $291,427; one-third interest was assigned to South Shore, when it should have been one-quarter interest, and South Shore proportion should be reduced: Cost of reproduction, from $104,954 to $97,142; present value, from

$78,716 to $72,857. Portage Ave. bridge, at Soo, I have assigned to Terminal Co., though bridge record of South Shore shows it as South Shore bridge. (Mr. Eldredge states this bridge to be South Shore ownership and covered by lease of one-half interest to Soo Line, stating one-half, instead of one-third, to go to South Shore.) In my appraisal, I attributed one-third of Portage Ave. bridge to South Shore; if owned by Terminal Company, one-fourth should be so distributed; if owned by South Shore, one-half should be attributed to it.

By going over the road, checking the valuation, item by item, it would be possible to find a considerable number of items that might be increased by placing a higher percentage of condition,
65 and perhaps an equal number decreased for the same reason; but, generally speaking, I have made no glaring errors, except those I have called attention to, and see no reason for making further corrections. I have recently made a trip over the entire mileage of the road.

At Sidnaw, it is possible my judgment has been somewhat affected by general character and upkeep of plaintiff's property and buildings, and that I have placed too high a value; I have no objection to cutting the value down to $750 per acre, though I question whether the property could be reproduced for that.

On real estate, I have based my valuation almost wholly on my personal judgment, based upon experience in purchases of railway lands, after having secured all available information and investigation of cost of other railway purchases in this and other states, in connection with valuation work. The information acquired consists, to small extent, of investigation of records and, to considerable extent, of sales for other purposes and the actual consideration paid by other railways for lands in the general vicinity, but the right of way values represent my opinion of probably cost of reproduction of these lands for railroad purposes, assuming South Shore did not exist.

The Master: In making up that judgment, you first determine what the land would be worth for other purposes, and then add what it would cost to acquire it for railroad purposes, is that correct?

A. Not altogether, for the reason that in many instances, particularly in the cities, the element of damages, the element of the cost of acquisition, I have aimed to include in this figure a figure
66 that would cover not only the increased value of the land over other land by reason of its railroad use, but to cover whatever there was in the way of severance damages, and of the cost of acquisition, which in ordinary country lands is a very considerable percentage of the total cost.

The Master: By cost of acquisition, you mean what is added to the value of the land for other purposes?

A. No, by cost of acquisition, I mean the cost to the railway company of acquiring the land, including the making of the abstract (it is usual and customary for railroad companies to have an abstract of the properties made, for their own use, before starting negotiations) and, in addition, the amounts paid to right of way men,

real estate men, employees of the company, or others, who negotiate and actually purchase the land. There should be a separation into the consideration paid for the land and the second element cost of acquisition. In the first element, the consideration paid for the land will range from two and a half to three, or even as high as five or six times the value of the land for other purposes.

RIGGS:

Cross-examination.

By Mr. Wykes:

In fixing land values, I have taken into account the fact that there is invariably an excess cost of lands purchased for railroad purposes over lands purchased in ordinary commercial tracts for farming or other general purposes.

Q. And that excess runs from two and a half to six; that was present in your mind when you fixed your land values, was it not?

A. Yes, sir, it was present in my mind, and I aimed to take account of it in fixing these prices to an extent that would be
67 conservative and reasonable. I did not in any case use a factor of six; in fact, I did not use that general method.

Q. You did not use any factor to get right down and state a percentage, did you?

A. No, but I did use my own personal judgment, keeping in mind the fact that there was such a factor.

Q. In other words, you consider there were three elements; there are more, but we will divide it into three classes, the cost of the land for ordinary purposes, then whatever would be included by way of severance damages, and then what should be added by way of cost for purchase?

A. Yes sir.

Q. Did you fix any definite relation between the cost for ordinary purposes and the cost which it would be for railroad purposes?

A. No, I did not. In the matter of country lands, I had generally in mind a factor of two and a half to three, and used figures throughout that are based generally upon three times the ordinary value of country lands, plus cost of acquisition.

The cost of purchase of country land is always a considerable item. I have found no railroad purchases in Michigan where the consideration paid the owner was less than $20 an acre, and $25 an acre is a minimum average paid owner, where purchased by agreement for railroad purposes; where purchased by condemnation, it is considerably in excess. The difficulty in arriving at a figure representing fair cost to acquire land is due to the fact that very few railroads have separated the consideration paid from the cost of abstracts, salaries and expenses of right of way men, cost of
68 condemnation, etc. In one case, where separation was kept for a five-year period, the cost of purchase per acre ranged from 75¢ to $25, while the cost per owner dealt with, or per transfer, ranged from $98 to 140 plus.

The cost of acquiring a long strip of right of way from a single individual might probably be less than the expense of acquiring a small description from another person. Ordinarily, in dealing with a farmer or small individual land owner, it is necessary to make three to ten trips to see him, before a price can be agreed upon and deal consum-ated. . I know instances where cost of acquiring was in excess of total amount paid for land. The available information as to actual cost of purchase is not such as to enable one to definitely fix an average price per acre.

I did not fix an average price. In country lands, I have used a minimum of $25 an acre, in which I have included cost of acquisition. I should say that would range from $5 to $15 an acre, through territory such as this, assuming separate ownership. I have not added any specific amount, but have fixed what I believe fair figures, including the cost of acquiring. In South Shore territory, that cost would range from $5 to $15 per acre.

I fixed figures that in my judgment would fairly represent the money a man would have to have if he went out to acquire that property for railroad purposes. I am not able to divide the cost of land so as to give the figure added for cost of purchase. I did not analyze my land values so as to show market values, added increment by reason of railroad purpose, and added cost of acquisition. I am fully convinced that the figures I have named for country lands are so conservative that my total amount would be exceeded, if we were going to buy the land now, in the element of considera-
69 tion paid to owners, only. I do not believe my figures are high enough to cover any considerable cost of acquisition.

I am not able to point out the different elements that go to make up my prices. The results are a matter of my best judgment, and that might vary from that of some other man, up or down. My judgment was made up, based on inquiry, first, as to cost to railroads—the consideration paid to owners; second, upon inquiry and finding out that lands were valued in certain districts at so much per acre for the land, plus an estimate of the value of the timber standing on the lands, in the case of timber lands; and third, that cleared, improved lands in certain territories were selling at prices ranging from $40 to $75 per acre, and taking into account all the elements, I have used figures that I believe represent a fair average figure, although I think that in counties such as Ontonagon and Gogebic, for instance, lands that I have averaged at $60 an acre, actual purchases, actual considerations to the owner might range from $25 or $30 up to as high as $150 or $175, depending on whether it was cultivated farm land or whether it was covered with good timber.

I have since been over the line twice, on special trains, and from Marquette to St. Ignace four or five times, by daylight. I have been around Marquette yard and property more than any other part of the system. While I have made no attempt to make a complete list of items not included in my appraisal, I have noted a couple of classes of items: (*a*) riprapping in Marquette yard, and along Lakes Michigamme and Gogebic, (*b*) ticklers at overhead bridges and

numerous minor structures, and (c) the photographs disclose, and I have noted by various inspections, more masonry in the way of retaining and parapet walls built between piers and bridges, and at the end of culverts.

70 I think all of the points I have noted are of those general classes; e. g., either more masonry than we have estimated upon, or minor structures of which there is no record in the engineer's office. All were visible items of work, like riprap, which would be put in by the roadmaster, probably in no case part of original construction, but built subsequent to the building of the road, and a class of work of which no record would be kept in the chief engineer's office. The riprap omitted here in Marquette is 700 or 800 feet of bank that has been protected by the unloading of large stone.

I made no estimates of this at Lakes Michigamme and Gogebic; there is riprap at three or four places at each lake, in lineal feet more than at Marquette, but the embankment is not as high and does not call for so much stone, and the location would not call for as heavy protection as on south shore of Lake Superior. The additional wall I have noticed was at one point, in one of the steel bridges; I am not sure whether it is an iron bridge, or the other steel bridge west of Nestoria, but it is one of the two. Also one of the arched culverts between here and the Soo. It has 75 or 80 feet of protection wall, an extension of one of the wing walls.

The total amount of masonry on the road in connection with bridges is a very small item; only a few bridges have masonry in connection with them. The witness made notes of the omitted things.

In my opinion, reproduction new value may represent value for railroad purposes more accurately than the lower figures; while it is not true in every case, I believe that, where conditions are such that if the property were eliminated it would be reconstructed, the property is worth what it would cost.

71 In my judgment, if South Shore were obliterated, it would be reconstructed, as it is the only link of direct connection between Upper and Lower Peninsulas, and the only direct connection from Copper and Iron Country of Upper Peninsula with Duluth and the northwest. I don't believe it would be possible to reproduce the property as it stands today under $19,199,105. It might be possible to go 10 to 20 miles from Marquette and establish a new terminal. I mean it might be possible to get away from some of the more expensive terminals and build facilities for handling certain classes of business at a less cost, but it would be impossible to serve the same location on any other route. In many cases, it would be impossible to materially change the route; e. g., any line serving Marquette, Ishpeming and Negaunee extending east of Marquette would have to occupy about the same location as this road from Negaunee to a point six miles east of Marquette.

I think the road would be put back at a greater cost than its commercial value. If the road were out of here today, other men would be found who would come in and speculate on the proposition of a

road connecting the copper and iron country with the Lower Peninsula, and I think that the same considerations that caused investment originally would cause the reinvestment of enough money to produce the property. The belief that it was a good thing caused the original investment. I don't know what the original investment was, and made no endeavor to ascertain that, as many of the old records of the company were destroyed by fire, and so far as I know there is nothing in existence relating to original cost of M. H. & O., M. & W. or other extensions prior to the eighties.

Undoubtedly, many items of original cost of a property built many years ago would be less than reproducing the same
72 items today; that would be true of timber construction and hauls, and also items affected by labor, so far as original work was done at a period of low labor prices.

On other items, where the existing property is a replacement of the original structures, that would have cost more on first construction that it would cost to reproduce the property at the present time; that applies to all forms of steel construction, cast iron pipe, masonry and other construction work. I think it is true that, on the whole, a road built in the period of 1858 to 1888 probably did not cost as much as to produce the property today, new, on items of timber construction, such as bridges, buildings, etc. On real estate, the cost would be materially less.

To some extent, the road was built over land grant areas, and to a large extent through timbered areas, where it was to the interest of the owner of the land to have the road, to bring his timber to market; that would affect the price. I know nothing about the local conditions at that time, but that was the fact on a considerable mileage of similar territory in Lower Peninsula. I think an analysis of most of the gift right of way would show that conditions were attached to it that would really make a material consideration in many cases.

In stating, in my article before the American Society of Civil Engineers, that there should be but one value, whether for reorganization, sale, taxation or rate making, I endeavored to make clear that the engineer should report facts as he finds them, and give his best judgment of cost and depreciation, and that it is no part of his duty to decide what should be included or excluded for any specific purpose. The physical reproduction value should be the same, whether used for taxes or rate making purposes. My value of $16,132,083 for Michigan is my judgment of reproduction
73 value affected by depreciation. It may be too high or too low for any other specific purpose. I have not included or deducted anything on account of earning ability, going concern value or intangible value. In real estate, I have included a value due to the value of land used for railroad purposes, the severance damages, the continuity and all other elements that go to make a value for railroad, different from a value for other general, purposes.

Q. Is not the excess value that this continuous right of way has for railroad purposes due to the ability to make earnings from that continuous right of way?

A. The higher value given to railroad lands is in large measure due to the higher use to which the land is put, and to the greater earning power of the land under that new use, and that higher use and higher value is clearly a part of the reproduction cost, although not necessarily to as large a degree a part of the original cost, but it is clearly a proper element for reproduction.

Q. The only thing that justified it is the fact that increased earnings over the ordinary use of this property may be produced upon it; isn't that true?

A. That is one element. The fact that the land is available for railway use and desirable for railway use, and the fact that when put to railway use it is capable of earning more than other land not put to such use, go to give the land a higher value.

Q. Then there is a value in that sense due to earning ability, increased earning ability?

A. To an extent, yes sir, as far as that increased earning ability may be said to be part of the higher use, if I may use that term, of
the land, than if it was devoted to raising corn or celery, or
74 alfalfa. The reproduction cost would be the same, whether
the investment be profitable or not, and whether the rate for passengers be two cents or five cents a mile. I have not undertaken to carry out my analysis of land values to such an extent. It is practically impossible to go through a county and say that the average is so many dollars per acre for the land and so many dollars per acre for the severance damages to continuity, and so many dollars per acre for the cost of acquisition, because one piece may be acquired at one figure and another, nearby or immediately adjacent, at a considerably higher or considerably lower figure, and practically no purchase of land has ever been made where the owner of the court has fixed all of these elements; courts have undertaken to say that the land is worth so much and that the damages are worth so much.

Q. In other words, we cannot give that?

A. You cannot; I have never seen it separated or never known of anyone attempting to separate it.

I have not added anything to the value for strategic position. The location from here east, where I have used a higher figure, the figure was made wholly on account of the nearness to the city of Marquette, and the fact that it was desirable, especially desirable land for other than railroad purposes, and that the price of the land would be materially higher than the price of a similar number of acres located over near Sand River or near the west county line, but there are a few locations on the line of the road where the road occupies a narrow bench, or a narrow valley, that has a distinct strategic value, and if it were necessary to locate the railroad elsewhere it would be impossible to build the physical property of the road anything like as cheap as the present property has been built for.
75 I have not taken into account any assumed saving by
reason of such location. Take, for instance, this line going east; if it were not possible to locate on that bench between the foot of the bluff and the lake shore, it would be necessary to go back into

the hills, introduce very heavy grades, and introduce many thousands of yards per mile of earth excavation and embankment in excess of the present excavation and embankment, and there are a number of locations where a similar condition prevails, and the fact that the road is located in that immediate locality is worth a great deal of money to the road, and if the road were being reproduced they could afford to pay a good many hundred dollars an acre for that right of way, rather than to accept a free right of way elsewhere.

My value included any increase in increment along South Shore, in the belief that the railroad is entitled to include in its value whatever may come from the increase in land values, just as the owner of a farm is entitled to include the increase of his land, as property. There has unquestionably been a large increment of land value along the South Shore. In particular instances, the figures I have named as fair cost of reproduction is less than actual cost to the company of acquiring the land. There has been a decided increase in country land values in several sections of the state and along the line of the railroad, and in some of the terminals, in the last few years.

The purpose of the 1900 appraisal was to furnish information to the state authorities on which to enable them to base legislation for equitable taxation of railway and other public service property.

Q. It has been thought, previous to that time, that the railroads were not paying taxes enough.

Mr. Butler: By whom?

76 Mr. Wykes: By the public and the Governor and the people who promoted this valuation. That seemed to be the sentiment in Michigan that led to this valuation, was it not?

A. Yes sir, I think so.

Q. And the purpose was to increase railroad taxation, was it not?

A. Well, the purpose that Mr. Cooley had in mind and expressed throughout was that the purpose of the engineering work was to furnish information as to the true physical value of the property of the company, to enable the Governor and the Legislature to prepare proper legislation.

Q. And to increase railroad taxes?

A. I won't say anything as to the motives of the Governor, but the effort througout the valuation was to eliminate from the minds of the men on the work the purpose of the valuation, and that for the reason that every man engaged in a prominent capacity on that work was a railway official, not at the moment in railway service.

The purpose of the 1900 appraisal, followed throughout, was to make a fair value of the property of the railroads, and the work was done by competent men, the force being as thoroughly experienced a lot of engineers as has ever been gathered on any public work. Considering the shortness of the time, the fact that the work was done in winter, and that railroad records were not kept or were inadequate, it is one of the most wonderful pieces of valuation work done in the country, and, as a whole, it stands up as a fine piece of work.

The Cooley valuation of railroads, including the South Shore, is the nearest approach that has ever been made to a correct
77 valuation of any of the railroads of the state, and, while not at the time claimed to be absolutely correct, it was claimed by Mr. Cooley to be, in his judgment, the best that could have been done, considering the lack of hearty co-operation of the railroads and the limited time for the work.

While I give both cost of reproduction and present physical value, it appears to me that a company of individuals is entitled to a return upon the entire investment in a property, provided it is maintained at substantially 100% efficiency. That is my judgment and opinion of what is right and wrong. I do not assume to state, as my opinion, any conclusions I may have drawn from reading the different cases.

The depreciation of a property of this sort begins as soon as the structure is built, and, to a greater or less extent, goes on increasing from year to year. The depreciation from year to year is partially offset by maintenance, renewal and running repairs, but, in addition, a depreciation takes place that must be represented by the difference between cost of reproduction and present value, in that every unit of the property will, sooner or later, come to the end of its life. If the company does not lay aside from earnings a fund during the lifetime of a unit, to replace it when the end of the life comes, the company must stand the loss. This difference between cost of reproduction and present value represents the accumulated wear, tear and loss of life of the various elements of the property.

I think that whether one or the other figure is to be taken as the basis of rates depends upon whether the owners of the property received the benefit of that difference in dividends, or whether it has been used up in service and they have received no benefit. A property where excessive returns are taken out in dividends should
78 be differently treated from one which barely exists without caring for depreciation. If, as the property wears out, a sinking fund were created to represent depreciation each year, the investment would be intact, and on that theory there would be no question that there would be the investment there that should receive a return. If no sinking fund is created, the life of the property that is there to serve the public is being exhausted.

The I. C. C. rules require setting up a sinking fund, to take care of buildings, tracks, bridges and other structures. Prior to July, 1907, it was almost the universal practice of railroads to disregard depreciation. In my judgment, a fund should be created covering, not only equipment, but all forms of perishable property, and each year enough should be put into that fund to replace the wear of that year; each year should take care of its own depreciation.

Theorectically, every year should bear its own depreciation, but, practically, you cannot apply that rule, on account of widely varying accounting practice of the different roads in the past and the varying practice now regarding the setting up of depreciation reserves in the case of tracks, buildings, bridges and other structures, other than equipment. It is not obligatory upon the roads to set up

depreciation reserves for other parts of the property than equipment, though some roads have done so.

In determining a value upon which to base a fair return, there are many things which must be taken into account other than the mere cost of reproduction or depreciated value. In choosing between the two, you must consider all elements of the past history of the investment, its returns and depreciation. There are roads in Michigan
79 clearly not worth, for any purpose, what they cost, or what they would cost to reproduce, being examples of ill-advised expenditure of money, and the roads, if eliminated, would not be reproduced today, there being no necessity for their existence. This road, in my opinion, is not in that class, and, if wiped out today, it would be necessary for the state to have it reproduced. I think that if it were not here today, all other conditions existing as they are, it would appeal to investors as a good proposition and would be reproduced; that is, that money would be found for it.

Any appraisal is a reflection of the judgment of the man or men who make it. The Cooley appraisal was the first of its kind, and was made by men without previous experience in appraisal work. The opinions held by these men 12 years ago are not necessarily held by them today; many of them have materially changed their views on account of their subsequent work and investigation and more full knowledge. Since Cooley appraisal, the accounting system of the railroads has changed, and information not then accessible is now, and has been for many years accessible, and, instead of expressing opinions based on recollection, as was then the case, opinions can now frequently be based on facts capable of being drawn from actual accounts. I believe I now know more about valuation work than ten years ago, and I have changed some of my views radically.

Cooley appraisal of 1900 was regarded as sufficiently accurate to make it the basis of the 1902-1905 valuation, which was, in effect, the bringing of the Cooley appraisal of 1900 down to date, by part of the same men as were employed in the 1900 appraisal. They were among the best men. The time for the 1902 valuation was limited; there was no field work for Upper Peninsula. The purpose of the
80 1902 valuation was to prove that railroad assessments were not excessive. The effect was to show that the complainant railroads, of which D., S. S. & A. was one, were under-assessed to the same extent as the general property. The purpose was to sustain the 1900 valuation, which was in excess of the assessments.

In 1902, Cooley's instructions were the same as in 1900; it was his desire, and that of his men, to get a correct figure, as nearly as possible, irrespective of results. In 1900, the men were instructed to disregard the purpose of the valuation; in 1902, the men all knew the purpose of the valuation, but I do not believe that caused any improper additions to the valuation.

I think it is unquestionably true that an engineer engaged upon appraisal work is influenced; he is surrounded by men who are seeking to establish certain things, and his work is essentially affected to some extent by the object of the appraisal, and that is the reason why all of the Cooley appraisals have been done by the organization of a

staff of experienced men, and not be depending upon one or two men with a lot of subordinate clerks.

Q. That was what led you to devote two or three pages, in your article that you read before the American Society of Civil Engineers, tending to the placing of safeguards against this bias that was sure to come in any work of appraisal?

A. Yes, I believe thoroughly that where one man goes in to make an appraisal, and surrounds himself by a lot of young, inexperienced subordinates, who carry out his will absolutely, or who carry out the will of the men who are having the appraisal made, that appraisal is bound to be affected, more or less, by the purpose for which it was made, and that it is far better to have such an organization as we had in 1900, consisting of 25 or 30 men with years of experience, and men of standing, to offset that tendency.

81 Q. But even after that experience that you had in 1900, with that select type of men, and your experience of 1905 and 1903, when you wrote your article, you said in it that it was impossible to get this bias out of your results, did you not?

A. Yes, absolutely, for the reason that we had railroad men; we had to have an organization made up of railroad men, and every one of those men had inbred in him the old railroad employee's idea of the tax gatherer, and, if we had permitted the idea of taxation to prevail, the tendency on the part of every one of those men would have been to under-value for purposes of taxation.

Q. And so from that we draw the conclusion that it is impossible in an appraisal to be without some unconscious bias by the purpose of the appraisal?

A. I think it is safe to say that practically all of the large appraisals, the state appraisals, have been as free as possible from that. I believe that it is impossible to make an appraisal that is not somewhat, in some of the items, affected by that prejudice.

Q. And that might account, to a great extent, for the difference between a witness on one side of a case and a witness on the other side, might it not?

A. That might account for the differences in some instances.

The 1902-1903 appraisal brought that of 1900 down to date, and made material corrections in real estate values. On roads in lower part of Lower Peninsula, corrections were made in unit prices of labor and material and new property added since 1900. Prices of labor and material were increased; there was a general stepping up of prices between 1900 and 1902, each year. In 1905 or 1906 appraisal, the Cooley 1900 appraisal was the basis.

82 Professor Cooley was later employed to report to the Attorney General the then value of the railroads, in connection with the 1905 assessment; the time was limited to five or six weeks, and no attempt was made to go further than to bring unit prices to date, and use additions and betterments as reported by the railroads. The Cooley 1900 appraisal was used as the basis, with my approval; the unit prices were adjusted, and I think there was quite an appreciable increase in valuation. On South Shore, there was increase

in physical valuation of about $1,400,000, cost of reproduction, and $1,100,000, present value, between 1900 and 1905.

A non-physical value was added by Professor Adams in both the 1900 and 1903 appraisals; the increase in physical value was due primarily to additions and betterments; increased prices between 1903 and 1905 did not affect the value to a very large extent, though there was some increase; some small items were deceased.

My 1911 appraisal was hurried, on account of necessity of reaching a tentative figure for the purpose of the first affidavit. My field inspection was made before the making of the affidavit, and the determination of right of way figures was in substantially its final form at that time—about September 1, 1911.

I regarded Cooley appraisal of 1900 as the most complete information available on such items as grading, clearing and grubbing; it formed practically the only basis for a quick determination. The only correct way of arriving at schedule items would be to make a complete re-survey of the property, which would take several months and cost considerable. I believe a complete re-survey of the road would show an increase of 10% to 20% over the
83 earth yardage I have given. I applied new unit prices throughout, basing them upon recent prices of South Shore, or other roads in the locality.

In some items, they are materially higher and in some lower; on the whole, there is an increase over Cooley 1900 figures, but I think in matters of unit prices they are not greatly in excess of Cooley 1905 appraisal. The tendency of prices of labor, lumber, and such material, has been upward from year to year; prices on certain classes of construction, I think, lumber, ties, and materials of that sort, will continue to rise. The tendency of prices has been to steadily increase, except in the matter of rail; steel prices have remained absolutely stationary from 1900, and iron prices are more nearly stationary than other prices.

The cost to purchase runs through all my real estate values. This is made up of services, abstracting, recording deeds, and like features. I have considered the land price named sufficient to cover all those items prescribed by I. C. C. classification of construction accounts as assignable to the item of right of way. I included in my acreage, in every instance, lands acquired by adverse possession, but have made no deduction in those values for the absence of services in acquiring, for abstracts, or for recording deeds.

All of the mine branches have very heavy movement of freight over them, heavy cars and heavy locomotives, and the same is true of these main stems, and the ties are in decidedly better condition on these main stems than they are on some of the sidetracks, especially in such places as yards, some of the yard tracks, where an examination, track by track, of ties would show a very poor condition on some of the tracks were, apparently, no renewal has been made for years.

84 Q. I think you made the remark that these branch lines were maintained in just a sufficient ratio of condition to be safe to operate?

A. Well, that is true, but they are lines that must be maintained in such condition that locomotives can pass over the entire length of them, and that heavy freight cars on the mine branches, the heaviest equipment the company has, can be taken over them safely, and their position and location is such that a derailment on any of them is a serious matter.

Q. But the logging and other branches, and industrial tracks, wouldn't be maintained to the same point that these mining spurs are?

A. They have to be maintained in a safe condition. They are not as high grade tracks as the mining tracks, but they are tracks that locomotives are going in and out of, and they must be maintained in a safe condition to operate without accident or derailment.

The percentage of 60% for ties is the ratio applied to express the condition of entire line, and inspection would not necessarily show that to be the exact condition on a specific branch. I think that, in general, the ties on the branches are not maintained in quite as good condition as on the main line, but annual renewals are made on these branches, and the ties on some of them, like some of the lumber tracks, are in considerable better than 60% condition, by reason of the fact that the tracks are comparatively new. There has been, within the last four or five years, quite an increase, a large increase, in this class of mileage. There is 39 and a fraction miles of net increase in track mileage, by far the major portion of which is sidetrack and branch. The acreage of right of way has increased comparatively little in the ten years since the Cooley appraisal.

85 In fixing prices for 36 acres at Humboldt and 18 at Champion, I had no sales for railroad or other purposes. At those places, I took into account the ways lands were cut, vicinity of buildings, mining properties, etc., with considerable land at Humboldt included between the two lines, and that the severance damages in the vicinity of Humboldt would be very serious in case of reproduction. At Champion, the old line to Champion mine runs right through the village, and the new line runs adjacent to and north of the village.

Land values in the vicinity of Champion and Humboldt are affected by known or prospective mineral values, but I have not placed any value that reflects mineral rights. If it is taken into consideration, the prices would be very much in excess of those I placed, of $350 to $500 per acre. If reproducing South Shore, it would be essential to have 18 acres, for the use of this company, at Humboldt, though, by changing the connection between the two lines, and shortening up the wye, the amount of land could be materially reduced—say one-half.

My property values are:

Service.	C. O. R.	P. P. V.
Exclusive Passenger	$507,665	$377,133
Exclusive Freight	5,557,099	4,184,647
Common Passenger and Freight	13,134,341	11,570,303

Apportioning the common property between passenger and freight services on the revenue train mile basis for 1911, of 48.28% passenger and 51.72% freight, assigns:

86

Service.	C. O. R.	P. P. V.
Passenger	$6,341,260	$5,586,142
Freight	6,793,081	5,984,161

Adding the passenger and freight proportions of the common to the exclusive passenger and freight gives:

Service.	C. O. R.	P. P. V.
Total Passenger	$6,848,925	$5,963,275
Total Freight	12,350,180	10,168,808

I have worked out no other basis for the division of the common property; on some bases, it would possibly be widely divergent from the apportionment I made, and on others it would closely approximade it. These figures are the allocation of my values for the property between passenger and freight. It is impossible to separate the common property, except through some outside basis of apportionment. I believe the revenue train mileage basis for division to be fair.

At the Soo, plaintiff acquired 84 acres for right of way, yards and terminals. In my opinion, this is all absolutely proper, and is no more than such a railroad as this should have in such a city. So far as actual present use of 84 acres of Soo property is concerned, only a very small portion is presently used for railroad purposes. Plaintiff has parted with a half interest in its own land through lease for joint use, acquiring a half interest in the 84 acres of Soo Line, not presently used.

The original 84 acres of plaintiff at Soo is no more than a prudent railroad manager would require for railroad purposes, building into that city. The probability is that all that acreage not built upon will in course of time be used; the same thing is true of the Soo Line property. But at present they are using, under joint lease, the terminals of the other road. If they were two hostile roads, there would probably be a duplication of yards, roundhouses and other property on these two parallel strips, and I hardly know what is a proper disposition of the unused lands in that instance.

87

All plaintiff's land at the Soo, except 7 or 8 acres of made land, which at one time had a sidetrack extending entire length, is in pres-

ent use; the 7 acres is included in my valuation as water front riparian ownership, which, to me, seems reasonable for future development. I think there is no present railroad use of the water front through this made land and extending west; there is no development in the way of mercantile wharves, etc., but it is land suitable for development for general merchandise docks of the company, for transfer to and from boats and cars. So far as I know, there are no plans for developing this water front, or for the use of the Soo Line property.

In my opinion, the land acquired by plaintiff originally is an absolutely reasonable amount to acquire and hold for railroad use; the same is true of the Soo Line. The element of uncertainty is introduced by the arrangement between them.

I think the lands held by plaintiff will all, in comparatively near future, be used for railroad purposes, and that, ultimately, all the lands owned by both companies will strictly — used for yard and terminal purposes. The growth of the community would cut a great deal of figure in whether those would be necessary. I don't
88 think the fact that the Soo has increased but 2,000 (or 10%) in population since the development of its great water power would have any bearing in the matter at all, as the failure to grow was due to the collapse of the boom due to the Clergue industries.

I should think the trans-continental business through the Soo calls for terminals there. The importance of the Soo as a terminal and manufacturing point makes it almost certain to have a future. The Soo is a sort of a semi-terminal for international freight passing through it, east and west, it being the terminals of South Shore, Soo Line and Canadian Pacific, trains being made up there for moving eastward on Canadian Pacific. They combine the trains of the two roads (Soo Line and South Shore) that move eastward, at the Soo, and Canadian Pacific business is broken up and divided at Michigan Soo.

At St. Ignace, the following property should be excluded as not being used in railroad business: Humphrey lot, $1,030, right of way to Martel furnace, $3,423, 1,206 lineal feet of track of same in place, and hotel lot.

In my affidavit, I excluded about one-half the acreage of the 70-acre tract (made up of 36 and 34 acres); I think entire 70 acres is properly railroad lands, and see nothing about it that would cause me to say any of it is not proper for plaintiff to own for yard extensions and shop facilities. Main line runs through the land east and west, one-third the way from north line. I think whole of right of way on one side is fenced, and portions of the property are used for manufacturing, and must be leased.

As to the water front property excluded in my affidavit, there are a couple of pieces that, so far as use for water front is con-
89 cerned, cannot be said to be in present use; one is described as water front outside harbor, and is in at $35 a front foot. The land extends from highway to water's edge. It is an open question whether any part of the hard land can be excluded. The riparian rights are not used; the land is used as a right of way, and the shore is riprapped along that frontage. From the main line track

to the water, it is not to exceed fifty feet; in places, it is 25 to 30. It would be possible to develop that by starting at either end, to get on to it. Use of riparian frontage there would involve considerable harbor improvement, making it expensive; there is nothing which would prevent its use, or that would make the cost prohibitive.

The hard land there is all used as main line right of way, and the center of main track is all within 60 or 70 feet from water's edge; my $35 a foot includes the right of way and riparian frontage, and I took the value of riparian rights into consideration in fixing my value.

A small acreage of land on south line, where plaintiff, in acquiring right of way, acquired the entire pieces, and where the building of the railroad has destroyed any value that this property had for other purposes than right of way, I have not excluded; such land should not be excluded. The 3 to 5 acres of this character is not actually used, the value, in my judgment, being entirely destroyed by the construction of the railroad. The value through here was $200 per acre, including the piece spoken of.

This is one of those things incident to purchase of railroad right of way, where right of way costs less if entire piece is taken than where right of way only is bought and damages paid for the remainder. It might have a value for pasture, if joined to the adjacent land.

90 In the neighborhood of the 70-acre tract, there are unused lands belonging to private owners; there are vacant and unused lots all through the city and in there. The property immediately south, joining this 70 acres, is not platted. In placing a value on the railroad property, the proper basis would be to ascertain what that property would be worth if platted. On all of these properties, the question was, what would the property be worth for other purposes. I platted no sales to determine the base value used for the 70 acres, but made inquiry as to lot sales in the vicinity, and used a figure not in excess of sales prices there. I was given sale prices and prices upon lands held for sale on the street that the Federal building is on, which is one of the principal thoroughfares of Marquette.

So far as I know, there is no present railroad use of Spring St. extended, Front to Lake Sts., 40 feet wide. There is a piece on the corner of the same block north, on Lake St., which is vacant; there may be some storage on it.

There are two pieces of land, one on each side of overhead approach, that were, unquestionably I should think, acquired when right of way for approach was acquired. That property would come in the class of lands that plaintiff would be compelled to purchase to maintain the high trestle across the street, and, having put up the trestle, it would be unsalable for any other purpose. I do not think it would be possible to buy two 50-foot lots to maintain a trestle 60 feet in height, and then hold that portion of the lots, 30 or 40 feet, not used for railroad purposes; I question whether it would have any sale value almost immediately under that trestle. I place on all the property in that block $50 a foot. If that were a fill, you would need it for the slopes.

91 Plaintiff's property at Marquette was acquired by at least three or four different corporations, at different times, namely, M. H. & O., M. & W., D. M. & M. and the Dead River. There were three railroad lines converging in Marquette about 1888:

The Marquette & Western had complete terminal facilities at Marquette, with shops and roundhouses. The south yard, and the main line from a point near the present station, along the water front, to the old roundhouse, and then out over what is known as the south line, belonged to this company.

The Marquette, Houghton & Ontonagon owned the north line entrance into Marquette, from the depot west, including the present roundhouse, shops and west yards.

The Detroit, Mackinaw & Marquette owned from the old roundhouse, near Jackson St., out along the water front, to the south and east.

These facilities were consolidated in the plaintiff, and, to a certain extent, there was a duplication of facilities.

I suppose that what is the present water front inside the harbor was originally divided between the M. H. & O. and the M. & W., and there is a riparian ownership on land that was clearly the right of way of the D. M. & M.

The 1,100 feet outside harbor is not used as riparian property, but as right of way, and every foot is in use to the extent that it is covered with railroad embankment and embankment protection, and railroad tracks. Whatever value the property has in the way of riparian rights is not now used by plaintiff. The 50 feet is actually occupied by the track, and along almost the entire front plain-

92 tiff has been compelled to haul and unload stone, to protect the railroad embankment from being washed by the waves. The whole strip of property is no more than enough to maintain a single track between the road and the lake.

I placed a higher value per front foot on it than on adjoining lands, as its ownership carries with *it* the riparian rights, which are not used. Outside the right of way, there is no land; it is a narrow strip of land between the highway and the lake. It carries with it the riparian rights out to the harbor line, and no use is made of the lands under water.

The L. S. & I. in Marquette didn't go through Lake St. on a free grant; if all the items of general expense connected with the acquisition of that right of way were segregated, it would be an expensive piece of right of way. I am basing this on the knowledge that the amount of money paid engineers, to try and work out that line through the streets, ran into several thousand dollars.

If right of way of South Shore opposite the 1,100 feet were in the street, I don't think it would make any difference in my estimate, though I have included 4%, aggregating something like $600,000, for engineering, etc. Even granting that there was no consideration in money paid for the land actually occupied, there is the question of abutting damages to be settled; that makes that class of right of way the most expensive kind to acquire.

In Main St., Front to Third, plaintiff was granted the right to

place its track to the old ore dock, occupying perhaps 30 feet and leaving a driveway on north side used for a street and on south by plaintiff as entrance to its depot. For that 30 feet, I included $75 a foot front, $50 on west side of Lake St. and $450 on each side of Front St., on the theory that the property is in the possession of
93 plaintiff, in actual railroad use, and that to acquire it today would cost not less than those sums. I would consider that property on the principal streets of the city located as this is would have a per foot value substantially equivalent to the value of adjacent near-by and similar property, without respect to whether acquired by deed, grant from the city, or in the course of litigation.

The $450 per foot includes all the elements of cost. Where I have allowed per foot prices, I think they are not in excess of reasonable and usual values for similar property, but that includes whatever there is allowed for acquisition. I endeavored to place prices, where I take it by the front foot, on the same basis as the value of adjacent near-by and similar lands, as I have been able to ascertain them, without regard to how acquired.

In my inspection for grading, I made no measurements, and took no cross-sections, but I had with me and examined, in going over the road, plaintiff's profiles, and at a number of points I checked, for several miles, the cuts and fills, to satisfy myself that the profiles were the correct profiles of the line, and that the work shown thereby had been completed. They were the original construction profiles, or copies; Ex. 2 is a condensed copy. We had the regular profiles with us, but did not use them to any great extent.

After determining the quantities of grading, based on the profiles, I made certain additions which were not made in any of the Cooley appraisals; e. g., shrinkage. This was discussed in Cooley appraisal, it being the intention of the Cooley appraisal to include sufficient yardage of earth to allow for shrinkage. My recollection is that no specific allowance was made for overhaul, it being the intention to use a price per yard sufficiently high to cover that. It is customary among engineers to add a percentage to profile quantities for shrinkage.

94 I satisfied myself that whoever had made the computation from South Shore profile had not allowed sufficient to cover shrinkage or waste, and that no allowance had been made for raising embankment, which has been done to some extent on South Shore, nor for filling certain bridges, filled prior to 1900 appraisal. For that reason, I added 10%, to cover shrinkage, and 7.5% to cover the other item. From subsequent examinations, I am convinced that my percentage additions are not high enough, and believe re-measurement and re-cross-sectioning of entire line would disclose at least 1,000,000 yards total more than I have estimated as having actually been moved in construction.

Cooley appraisal price for earth grading was 25 cents per yard. My recollection is it was discussed and decided that that price would be sufficient to cover overhaul.

In Minnesota and other state appraisals referred to on direct examination I do not know whether they added a percentage for shrink-

age, or how they arrived at their quantities. It must have been added in additional quantities, because their quantities are higher; I draw that inference from the knowledge of the quantites they get and my knowledge of what would result from the profile. The inference is that it must have been added somewhere; but I don't know how they arrived at the figures showing the yards.

In other state appraisals for which I gave costs for grading, I do not know whether those took into account the items of overhaul and shrinkage in fixing the price, or whether a percentage was added; I assume those elements were taken into account, but do not know in what form. The general instruction in Cooley appraisal was to add to figures computed from the profiles for shrinkage, but my ex-
95 amination of the profiles indicates that the Cooley yardage was made by taking the embankment yardage as disclosed by the profile. I figured it for portions of the line, and reached the conclusion that whoever figured it for the Cooley appraisal did not make these allowances.

I satisfied myself, by examination of the profiles, that Cooley appraisal used embankment figures only. I tried to ascertain how the Cooley figures were made up. I did not go to the original records to find out, but the Cooley appraisal, as it appears in the final report, is in sufficient detail to enable an engineer to arrive at, in a general way, a correct conception of the method used. The results, on my computation of the profiles, appear to be a little more than those figures on the Cooley appraisal, and from that I reached the conclusion that nothing had been added for shrinkage. I went far enough to satisfy myself that Cooley appraisal figures were not high enough to represent actual amount of material used.

I didn't re-compute from the profiles all of those quantities. To have done so, would have taken a force of men a couple of weeks, and would have taken my time for a couple of months. Using Cooley figures as a basis, and my judgment as an engineer, I made this as an approximate estimate of the yardage of material in this work, and am satisfied a re-measurement of the work would show an increase of from 1/5 to 1/6 of the total yardage. I have been back and forth over the road, and have had those profiles, and feel certain, from general knowledge of railroad grading, based on twenty-seven years' experience in construction work, that there is more yardage per mile than I have testified to.

I satisfied myself that Cooley figures were arrived at by taking embankment figures. The Cooley figures are divided up in various sections, and by checking any one of them from the profile it
96 can be found out how the Cooley figures were given. The rules of Cooley appraisal required the engineer estimating grading quantities to add for shrinkage. Afterwards, without looking at the computations made by engineer on Cooley appraisal, but from profile computations of my own, I decided he could not have followed those rules, or added for shrinkage, and I added an additional 10%. Straight through, I have added to Cooley figures 10% for shrinkage and 7.5% for other elements, or irregular slopes, extra

grading at various points, and overhaul. The total amount added for shrinkage is $178,000 plus.

I added to Cooley appraisal yardage of grading 17.5%. This particular item depends on judgment, without possibility for reaching actual results, about as fully as any other figure in my appraisal. A correct estimate depends largely on the judgment of the engineer making it, and the accuracy of that judgment would depend largely on his experience and his knowledge of that class of work.

A yard of earth coming out of a cut will temporarily make considerably more than a yard of earth in the fill; it will then settle, and we require the contractor to raise the fill. In practical construction, we take care of what is known as shrinkage in setting the stakes in the fill at a higher elevation than the final height of the fill, and then settlements will take place, and frequently it is necessary to raise and widen the banks. The shrinkage is between the line we fix for the contractor and the line to which his embankment subsequently settles to be—the profile line. We put the shrinkage on the contractor; the contractor makes his price based upon earth in place, after the settlement has all taken place.

The earth is paid for on its quantity, as it lies in the cut, as a rule. It frequently happens that earth is paid for in the
97 fill; it is then paid for on measurements of the fill plus shrinkage. In practice, you measure all of your cuts and measure all of your fills, in order to keep a line on your overhaul.

I uniformly allowed 30¢ a yard for cost of earth grading, as of the middle of 1911, which is my judgment of the fair price, in view of the fact that I have not classified hard pan, and have not allowed overhaul except by yard. The price is not based upon my personal experience in Upper Peninsula, as I have done no contract work there since prior to 1900, and that previously was not comparable with this.

Range of prices in past few years, depending on character of material moved, is 24¢ to 38¢, unclassified, and some contracts are higher for hard pan and lower for earth; the prices depend upon equipment used and quantities moved. Mr. Young testified, or said, that for new cut-off he had bid prices of 27¢ and 30¢ per yard. On making up his mind that the company could do it as cheaply, it was done by company, at prices over 27¢. This higher price was due to finding underground ledge of rock, which in part paralleled the line of excavation, increasing the cost. I do not know as Mr. Young's 30¢ price included rock; there are no very accurate records. I talked with Mr. Young, got his price, and confirmed it from company records. I found cost of part of new line built by the company, and that is part of my basis for 30¢.

In getting at cost of 2.4 miles of new line, I used actual cost. I assumed the earth to be moved at 30¢. From that I found the number of yards; I did so, as I had no record of the yardages; I had an approximate estimate of Mr. Young's yardage, but none of that moved by company subsequently. So I deducted the known
98 rock at $1.25, and divided the remainder by 30¢, to give the number of yards. I then multiplied back, to get the cost.

I had Mr. Young's cost and yardage. Mr. Young did about one-half the work; i. e., for one track; company built the grade for second track. For both, this totaled a certain amount. Mr. Young's and Mr. Simar's estimate of rock was 6,000 yards; they had no definite figures, but used 6,000 yards. I confirmed this by inspection, without measurement.

As a basis of my 30¢ grading price, I also used my experience in contracting this class of work over past 5 or 6 years. Besides the figures on cut-off, there are numerous other figures where South Shore contracted several small pieces of work; e. g., on small contract—on Palmer and Mary Charlotte branches—prices, 22¢ to 40¢ for earth, 40¢ to 60¢ for hard pan, and 45¢ to 60¢ and up for loose rock; they were such small contracts, I do not think them a fair criterion.

With hard pan classification, price of 25¢ to 30¢, with an average of 27¢, would prevail on this whole line. Contractor makes higher price for hard pan, due to greater difficulty in moving. It is difficult to say what will develop in respect to character of earth—whether there is much hard pan—from going over the line.

The 22¢ price was in sand country, on Deranson spur. Most South Shore contracts have been around or above 30¢. I should accept Mr. Young's statement, that grading cost over 27¢ and close to 30¢, as correct. I feel the 30¢ for grading fair, taking into account absence of hard pan classification. It is 5¢ higher than Cooley 1900 figures, and there has been a material increase in labor cost since then. Cooley price included overhaul, which is here added, as part of an additional percentage. Had each appraisal (Cooley and Riggs) been based upon known yardage in same
99 territory, so they would be comparable, my price would have been a little lower than 30¢ or his a little higher than 25¢; mine would be relatively higher.

Cooley 25¢ price applied to entire state. So far as soil conditions are concerned, Upper Peninsula and Lower Peninsula are not radically different. Labor conditions are more difficult, teams are harder to get, and distance of hauling supplies is greater, in Upper Peninsula than in Lower Peninsula, and cost of maintaining camps and boarding outfits would be greater in the Upper Peninsula.

The 17.5% added to represent shrinkage and other items would be affected and increased by overhead percentages of 26.5%.

I did not depreciate ballast. There is on all roads, especially those with gravel or cinder ballast, a necessity for furnishing additional ballast to take care of maintenance of track as the joints are lifted, and to take care of the ballast necessary to support what we term "shoulders"; that is, sufficient amount of ballast at the ends of the ties to hold the track to line and prevent swinging out of line with passenger trains.

The purposes of ballast are: (*a*) to permit drainage, (*b*) to furnish elastic foundation for ties not subject to rapid deterioration from storm, and (*c*) to hold the track to better line and grade than possible with ordinary earth. There is added to the ballast every few years additional yardage, in the nature of a maintenance expense;

like track surfacing, it requires more or less work every year, to keep it up to the standard of operating condition. I consider the cost of placing the ballast, after it is placed, like surfacing, is maintained to substantially 100% of operating condition by the large amount of money spent upon the track in maintenance every year.

100 I decreased the yardage of ballast, shown in Cooley appraisal, 10%. The additional work of ballasting increases the number of cubic yards of ballast on every mile, though I don't believe you would be justified in adding to yardage per mile after you have reached a proper yardage for this class of ballasting. Ballasting is like track laying and surfacing—as long as the road is maintaining its property and spending $400 or $500 per mile per year in maintenance of track and ballast, I do not see how we can consider that the ballast is losing any of its value. There might be a little deferred maintenance,—that is, one mile of track might not have all the money that is coming to it this year,—but next year it will get it, and the material is all there.

There is an appreciation of roadbed due to ballasting during, possibly, the first 12 or 15 years. After the first few years, not a great amount of ballast will go into the earth. The more ballast you put on, the better your drainage, but that is about the only advantage after the first 10 or 12 years.

After ballast has been delivered, placed and dressed, it is unquestionably in 100% condition, and I would go further, and say the same at the end of one or two years, after the track had received a second and third lift. I mean that after ballast had been re-surfaced in the course of maintenance two or three times, and on a well maintained road all of the track is gone over once a year at least, I would say that the track was in better and more suitable and stable condition than when the ballast had been first delivered, and that, while there might be apparently less ballast there, you couldn't say there had been any depreciation of ballast, because your track was really more stable and in better condition than it is immediately after it has had its first—after its final dressing up, im-

101 mediately after the delivery of the ballast.

The road must be gone over every year; every foot of the track is jacked up and lined, put to exact line, and all the ties are tamped under. They loosen up the centers, tamp under the rails, and get that track in perfect condition; that has to be done every year, no matter what ballast material is put on, and whether new ballast is added or not. New ballast is not added yearly; sometimes 4 to 6 years elapse. Now, all of that lifting and tamping results in eventually taking more ballast under the track, and less around on the shoulders, and the only depreciation or deterioration that takes place after three or four years of such work is such mixing of part of the ballast with the earth of the embankment as comes in the handling of gravel on top of the sand bank or clay bank.

Q. And in addition to this doing something to the ballast every year, there comes a period when you must put in new ballast; that is true, is it not?

A. There comes a period when it is desirable and sometimes ab-

solutely necessary to put in some new ballast, to take the place of that which has disappeared from the shoulders and been driven down into the roadbed.

Q. But at the time that that ballast was first put in, there was no necessity, then, for anything else, was there?

A. No, if the road was fully ballasted, or given a sufficiency of ballast, at the time it was put in and after the final lift had been made, and after the final dressing up of the new ballast, I think we would say that the ballast was in 100% condition. Now, a year from that time after the road had received its annual re-surfacing, in my opinion, that piece of road would be better—that
102 ballasting would be better than entirely new ballast.

Q. But there comes a time when we must put on each mile of that not less than a thousand yards of new ballast, at a cost of $500, within the next four or five years?

A. The time may vary, but there comes a time when it is necessary for us to put on more ballast, ranging from 400 to a thousand, and on some lines perhaps 1,600 yards—yes, unquestionably. That keeps on just as long as the railroad runs. The ballast under the roadbed proper I think may be said to go into the ground further; the tendency is, of course, to drive; the weight of the train comes directly over the track.

I have followed the precedent of Mr. Cooley and other appraisers, that, so long as the property is maintained, the labor elements in track laying and surfacing do not undergo depreciation. I think there have been some appraisals which depreciate ballast, though the general practice has been not to depreciate ballast or track laying. In 1900 appraisal, depreciation was allowed on not more than 3 or 4 small properties, which had never been re-ballasted. Ballast on South Shore was not depreciated in Cooley appraisal.

Q. The deterioration of ballast is described by the term being worn out, isn't it—ballast worn out?

A. That term has been used, and is to some extent used, among railroad men, having particular reference, I think, to the fact that the surplus ballast necessary to maintain the shoulders and proper filling of the track has to some extent been reduced in quantity, or partially disappeared. I think that, to the extent that ballasted track is permitted to deteriorate for a long period of years after the ballasting on the shoulders disappears or is reduced in quantity, there might be said to be some wearing out.

103 If the ballast goes to a point that there should be a renewal, and there is no renewal, but, on the other hand, the company continues, year after year, working over its track, using the same old ballast, it does, in the course of time, become so mixed with other earth as to lose much of its value as ballast, and in that case I should say that there was a depreciation.

Q. Well, hasn't it lost its value when it goes to a point where you have got to supplement it by something that costs, as you stated this morning, from $250 to $750 a mile of track to put it back into the condition where it started from at the last renewal?

A. No, I don't think so. We started out with our assumption that

new ballast, after it had been surfaced and dressed, was worth a hundred per cent, or was in a hundred per cent condition; that is, it was new. A year from that time, it has become settled; it has gone a little bit into the roadbed, but after it is resurfaced, the track is in just as good condition and worth just as much money as railroad track, and just as near a perfect condition as it is possible to make it. Now, the same thing will happen the next year. During the period between the maintenance of 1909 and 1910, the whole track depreciates a little; some of the joints get low, some of the bolts get loose, and the ballast is pounded down a little more at one place than at another, but the repairs that are put on it keep it in safe condition, and, at the end of the general lifting and surfacing that the road receives every year, it is brought back to substantially perfect condition. Now, after five or six years, you put on more ballast, and it is not like the taking out of an old rail, where you completely remove all of the rail, nor like the taking out of a tie that has rotted, when you pull it out and put it out on the side of the right of way and burn it up; all of the old ballast remains there, and along with that old ballast is 500 or a thousand yards per mile of additional ballast, and you bring your track—you commence, then, to
104 put your track into your hundred per cent condition, but the condition of your track when you commence to put in this second lift is far better than it was before there was no (any) ballast at all.

Q. With the lapse of time, and with use, a part of the useful life of the rail disappears, doesn't it?

A. The rail wears out.

Q. A part of the useful life disappears, doesn't it?

A. Yes, every year.

Q. And with ballast, a part of the useful life disappears with the lapse of time and with use, does it not?

A. No, I fail to see how you can wear out broken stones; you can mix it with dirt.

Q. Doesn't the useful life of it disappear; that is the point?

The Master: In the position that it occupies?

A. No, it doesn't. It may get out of place; it may settle down under a wet joint.

Q. Then, if the useful life doesn't disappear, what is the necessity of putting on more?

A. The necessity of putting on more is to replenish the shoulders, to replace that which has worked into the embankment, and to replace that which has been lost by the operations of the men.

Q. But, if the useful life of that ballast had continued the same as when it was put in, in the same condition, it wouldn't be necessary to put more there, would it?

A. If it were not necessary to work over that ballast, it wouldn't be necessary to put over more. It doesn't wear out under
105 traffic, as your rail does. It doesn't rot, as your tie does, and whatever depreciation there is comes from the fact that you

are working with it. Now, if you are spending $600 or $700 a year, as is the case on some classes of road, or from $400 to $500 a year, as is the case on other classes of road, in maintenance, in operating expenses, in maintaining your track, I fail to see how anyone can justly arbitrarily say that the value of any part of 3,000 or 3,500 yards of stone has disappeared.

Q. When you put it there, it is in position where it is useful and where it has 100% value, and where it is not necessary to put any more there; that is true, isn't it?

A. That is true.

Q. And by reason of use, by reason of the lapse of time, it gets away from that position, doesn't it?

A. By reason of use, and by reason of the lapse of time, it is driven into the embankment, and some of it gets away from that position, yes.

Q. And you cannot get it back to the position where it is 100% value, and where it serves every useful purpose that is necessary, can you?

A. No, perhaps you cannot get all of the ballast back in position in which it was when it was first placed, but, on the other hand, you cannot pick out, on a well ballasted road, any mile of track and say that this mile is in 90% or 80% or 70% condition. The chances are that measurements made on any ballasted mile of this road would disclose the fact that there is substantially as much ballast as I have estimated, and on many of the miles measurement by excavation would show from three to four times as much gravel as I have estimated.

Q. That is not the question. I want to confine you to the question of depreciation?

106 A. Now, my point is that there is no way in which you can determine the depreciation of stone, because your ballast is in reality nothing but stone delivered along the road. The only way in which depreciation would really come would be the disappearance of material, by the actual disappearance of ballast; you cannot say that because weeds or grass are growing up in ballast it has depreciated. I do admit that in the course of time it does disappear, but I do say that the ballasted sections of this railroad doesn't disappear to any such extent that it is possible for any engineer to come on the ground and say that 10% of it has actually gone.

The Master: By ballast, I think Mr. Wykes means ballast in position, and by ballast, you mean ballast, whether in position or out of position.

A. There is this distinction, that must be kept in mind: The classification of accounts provides for ballast as laid down along the track. I have included in my price ballast in position, but the ballast, the stone itself, is purely an item of material, just like ties or rails, and the labor of placing the ballast in position is, in reality, surfacing.

The Master: That is where you and Mr. Wykes part company; you are talking about ballast, absolutely, which does not deteriorate,

and he is talking about ballast after it is put in position, which includes the labor, and that does include the labor.

Mr. Wykes: I don't think I misunderstand Mr. Riggs, or that Mr. Riggs misunderstands me; the only difference between us is that he, perhaps, doesn't entirely agree with what I think is consistent.

Q. Now, Mr. Riggs, you take a railroad that is completely ballasted, so its ballast is in 100% condition; take the same railroad—that is, just the ballast item—three or four or five years later, during which intervening time there has been no ballasting; is the
107 ballast not worth more at the time you start with your ballast new than it is at the time of the lapse of 3, 4 or 5 years, when it becomes necessary to re-ballast the entire road. I wish to exclude that *that* for the purpose of this question the question of appreciation of roadbed; I am talking about ballast, solely?

A. I think that if you would extend your period of time, and not limit it to 3, 4 or 5 years, I would answer yes. I mean, by that, that, if a railroad is built new this year and ballasting is completely finished this, unquestionably some parts of the road will show greater loss of ballast than others, and, if no renewals of ballast are made at all for a period of 5, or possibly of 6 or 7 or 8, years, I think that, unquestionably, the ballast at the end of that time would be worth less, by the fact that a certain number of yards per mile of ballast, on the average, had disappeared, or that, perhaps, on some miles substantially all of the ballast had disappeared or gone into the bank or had become mixed up with the earth so as to lose its character of ballast. But, if a railroad begins at the end of the second year to replace ballast, and replenishes the ballast at the points where it is most needed, and continues that replenishment, treating, every year, a few miles, I do not think that, in that case, you can say that you have a condition where your ballast on a mile of road is worth less than your original cost of ballast, because, when you replenish your ballast on a mile of road that already has three-quarters to four-fifths of the original ballast there, you certainly are starting with a better condition, and your new 100% condition is certainly a better condition, as far as the track is concerned, and as far as the usefulness of that ballast is concerned, than it was originally.

Q. You haven't answered the question of whether a road is worth as much immediately before the period of new ballasting as it is immediately after the last period of new ballasting?

108 A. I could conceive that, if no ballasting was done on a road, the ballast would be worth less at the end of a period of years than it was when first new. Now, this question assumes that a railroad is ballasted, permitted to run for a period of years, and then completely re-ballasted. No such condition as that prevails.

Q. Get it down to this point: Apply that question to a mile of ballast on a railroad; you will admit that a mile of railroad is ballasted at perhaps reasonably stated intervals?

A. Yes.

Q. Would a mile of railroad, so far as the item of ballast is concerned, be worth as much immediately before the period of new ballasting as it would immediately after the period of old ballasting?

A. Well, now, there comes in the question of what kind of a mile you have assumed.

Q. Any kind of a mile that is ballasted should be ballasted again, I don't care, of an existing railroad that has gone for a reasonable period of years?

A. I think that, if the track upon a mile of railroad is maintained to su' stantially perfect line and grade, the adding of new ballast and again putting that track in perfect line and grade would make no difference in the smoothness of that road, or its value as part of an operating railroad. The placing of the new ballast would give an additional yardage.

Q. And an additional cost value?

A. And, to that extent, might give it a material added cost value.

Q. So it would be less value immediately before you had to spend from $250 to $750 on that mile for ballast?

A. Unquestionably, the adding of from $250 to $750 worth of ballast per mile would put the road in better condition, and
109 the road should be better, to the extent that there was that much more ballast on it. The whole thing is so intimately tied up with the condition of the particular piece of track that was under investigation, as to its maintenance and as to whether that mile or that section has received, during the year or during the period of years, its due share of maintenance. There may be deferred maintenance on the whole track; that would affect the conditions of the track ballast, as well as the track laying and surfacing.

Q. Deferred maintenance would mean a deterioration which should be depreciated, wouldn't it?

A. No, not necessarily. I think I can illustrate that better by another class of property than railroad property, because railroad main line property per mile should receive su'stantially its due share of maintenance each year. But emergencies often arise where in one year a certain stretch of track will receive more than its share, other track being neglected; the next year, the section that has been neglected will receive its share, but, where the general average of maintenance per mile of road indicates that there is no neglect, I don't think there should be any depreciation, even though there is a deferred maintenance on some particular miles of road.

Q. And even though that would require a considera'le expenditure to bring it up to full serviceable condition, to the best condition it could be in?

A. If your road is being neglected, and if your maintenance accounts show that you are not spending your money on your track, to maintain—you are not spending a normal amount of money, then, unquestionably, your whole road is depreciating; but, if you are spending the money, and you are not increasing the value of your property by reason of these expenditures, that is, if you are
110 legitimately maintaining your property, and are making no additions to the property account on account of those expenditures, I don't think it should depreciate.

The Master: Isn't the sum and substance of it that whether you are re-ballasting or not will add to the value of the road, depends on whether the re-ballasting is needed or not?

A. Yes, and also the fact that the re-ballasting is a continuous proposition, that there is some of it goes on every year.

The Wisconsin appraisal depreciated ballast.

From my information and investigation, I can say that the ballast on the South Shore has greatly improved since the Cooley appraisal, and since 1907. More or less work has been done every year, and the physical property of the company bears evidence of the fact that there has been a continual improvement in the way of extending the ballast, and putting St. Ignace ballast and stamp sand in territory that was formerly ballasted with other material. My personal opinion is that a very considerable mileage of plaintiff has been ballasted since 1900, and that the work has been so extensive as to amount to practically complete re-ballasting.

My recollection is that there were no charges, or very small charges, for ballasting, to capital. I made no attempt to adjust any of the charges as appearing on plaintiff's accounts between operating expenses or additions and betterments. There is a charge to additions and betterments for ballasting on the new double track, but, where they were re-ballasting or ballasting existing line, I remember having found no charge to construction or betterments due to ballasting. I went through the additions and betterments accounts for 10 years.

111 There were varying prices on contract work of the South Shore, for small jobs of from 4,000 to 14,000 yards in each contract: 1904, earth excavation, 26¢ per yard, and hard pan, 40¢ per yard; 1907, Mary Charlotte Mine, earth, 40¢, hard pan, 50¢, mine waste, 60¢, loose rock, 75¢, solid rock, $1.35, and overhaul, 2¢ per yard station of 100 feet, with 600 feet free haul; 1909, Volunteer Mine, earth, 35¢, hard pan, 50¢, and overhaul, 1.5¢ per yard station.

For Mr. Young's statement of cost of cut-off, he estimated 6,000 yards of rock and 154,000 yards of earth, with a total cost of $45,764.26, including both rock and earth, no separation being made. That price included charges for rental of equipment, supplies, and apparently all elements that go to make up the cost of the work; the cost was 27.5¢ or 28¢ per yard. The second track grading was done immediately after, by South Shore; the cost was $10,744.78, and I estimated the yardage by dividing the total cost by 30¢. Based on Young's price of 27.5¢, the yardage would go up a little. The $10,744.78 is simply the pay roll distribution, with no allowance for train service, rental of equipment, supplies, engineering or supervision.

In general, South Shore charges include nothing for engineering, supervision, or overhead expense on construction work, as they follow literally paragraph 15 of I. C. C. rules for additions and betterments, to the effect that no charge shall be made to additions and betterments for services of a general officer of the company or employee regularly engaged in other work and who gives but partial time to the particular work.

On ties, I figured percentage of condition at 60%, on inspection and my judgment as representing average condition of ties. I would say that the percentage of condition on South Shore ties is higher than 50%, without hesitation; I do not believe I have seen a

112 mile of main line road on South Shore where I would put the tie percentage as low as 50%. On tie life, I would take Young's experience here, or accept his judgment, because there is, or may be, quite a marked difference between the tie life here and in Lower Peninsula. On the supposition of tie life of 9 years and renewals on the basis of 11 years, as I figure it, the theoretical percentage would be below 50%, but I don't believe there is any main line mileage of the road in which the physical condition of the ties, as appearing from inspection, would be as low as 50%, and that certainly would not apply for an average.

My inspection was from moving trains, and, at points, where I got off to look at bridges, and in walking through yards. It is true that it is difficult, in going over a road on a train, to form an absolute opinion as to ties in the track for a long time; this and last year's ties can be picked out, but after two or three years it is difficult to distinguish from surface appearance.

Many ties that have been in the track for years are cracked, dirty, and appear to be in bad condition, but may be perfectly sound, and good for several years of service, while I have seen bright, nice looking ties that would not stand a hard blow without showing that they were affected by heart rot or otherwise. The section boss examines the tie he is to take out, carefully, and goes over his particular 5 or 6 miles, hundreds of times a year.

When I made inspection, all the renewals for the year were in; they are made in the spring, as a rule. Where a railroad is being ballasted extensively, tie renewals are super-normal, due to the fact that, in lifting the track for a 6 inch raise of ballast, it is necessary to take out ties that would be good for several years.

113 I do not remember that Young fixed 55% as his percentage of depreciation. He stated that in supporting the proposition that no tie in the track should be depreciated below 50%, because when it got to the point where it must be removed there was a new tie on the ground to renew it and the two, taken together, would be 55%. It is mathematically true, that where the cycle is being carried out, and if the life be 9 years, and renewals are made on the basis of 9 years, your would get a 50% condition; but, as a matter of actual condition, you would fix a higher percentage.

I spent more time in inspection than was spent by anyone in 1900 State appraisal. My inspection was much more thorough than was possible in 1900 appraisal, because of weather and inspection conditions, and I had the company records with me; I believe my inspection enabled me to place substantially accurate percentages. I think two competent engineers might vary, on the same inspection as I made, 10% or 15% on condition of rail; I do not think competent engineers would fall under my percentages. The variation might be 5% over or 5% under me; I think the variation would be up, rather than down. I should be surprised if you did not find quite a number of duplications in my work, and, in my mind, a detailed examination of the property will disclose omissions as numerous as the duplications.

On the cost of installing the switches, I think I have seen no en-

gineer's estimate at a less figure than $25, though I have seen them running to figures I considered excessive—$80, $90 and $100.

There is frequently variation in the estimates of engineers on labor items of railroad standard structures, such as switches, or installing crossings, or putting in highway crossings, or installing railroad crossings, due the different experience of different men in dif-
114 ferent conditions under which they have worked, that might cause figures 25% to 30% lower running to 25% to 30% higher than those I have used.

Q. That variation might extend further, it might extend into other railroad structures, might it not, small station houses, section hand houses, and these smaller structures that we find all along the road?

A. Yes, I think that that is true, that in arriving at a figure to represent a fair cost of reproduction of such structures an engineer will adopt one of two methods; he will either use some unit of square foot or cubic foot price, and apply that to buildings, or, to be more exact, he will measure up the material in the buildings and make detailed estimates, and, in either case, there is likely to be considerable variation.

Q. Even though the same method is pursued, the two different engineers would vary somewhat, at least so far as the labor items were concerned?

A. Yes, I don't think that variation would run so much in the case of labor items involving large amounts of timber, where prices of $8 to $10 a thousand are used, based on a wide range of experience, but on minor structures, such as hand car houses, or oil houses, or pumping stations, there might be a very considerable variation in an estimate, and, equally so, there might be a very considerable variation in the actual labor cost of two similar buildings.

I think that if it were possible to take the time for another appraisal, and go into minute details, it might be possible to still further eliminate or reduce the contingency item, on some of the schedules. I continued certain of the items of overhead charges without depreciation, because they are legitimate, proper and neces-
115 sary expenses that any railroad must incur in the original construction of its property. It is likewise necessary to incur the expense represented by the difference between my present physical value and fair present reproduction columns to reproduce the property; to reproduce the property, they must make an expenditure equal to the cost new of the elements.

I added 2% for engineering on equipment, which was not added in Cooley appraisal, where no allowance for engineering of any character was made on equipment. A considerable portion of the expense of engineering on equipment finds its way into the operating expenses. So long as the equipment continues in existence, the item of engineering would continue without depreciation.

For legal expenses, I used the percentage almost universally used in railway appraisal work. For several years, I have been securing data on all classes of construction work, and I find the item has a wide range, depending on the character of the property and its location; from data apparently reliable I find the percentage to range

from .38% to over 4%. I have not found complete and satisfactory records of new railroad construction that would enable me to say anything higher than .5% would be proper, though I have found them running from slightly less than .5% to over 1%, since promulgation of the I. C. C. rules. The item is incapable of absolute determination, being in the same class as engineering; it does not include costs of right of way purchases; that is something additional, which inheres in value of right of way.

In all of Cooley's appraisals, he has used 4% for engineering and .5% for legal expenses, and Wisconsin, Minnesota and South Dakota used 4.5% for engineering and legal expenses, while Wash-
116 ington, on Nothern Pacific, used 5% for engineering and 1% for legal, and, on Great Northern, 3.5% for engineering and 1% for legal; Nebraska used .5% for legal. Other appraisals have used a higher percentage, though I cannot say just what it is. Wisconsin, Minnesota, South Dakota, Washington, and Mr. Hogeland for railroads in Nebraska, have followed Cooley precedent, and applied legal percentage to roadway and structures items, excluding equipment. Mr. Hogeland, on C. & N. W., used .5% for legal, as applicable to all expenses. I have assumed four years of construction of South Shore, and allowed $21,000 plus per year for legal expenses.

Legal expenses would consist of the services of attorneys in connection with the organization of the property, the incorporation of the property, the services of attorneys, and law expenses, in connection with the construction of the property, beginning from the inception of the project, to the final completion, involving all legal services in connection with contracts for construction, contracts for purchase.

There is more law business connected with a railroad after than during construction. The ordinary property of this class spends, annually, a large sum, and in case of large properties there is infinitely more money expended per annum, in connection with the operation of the property, than there is in any year during construction. Those items during construction would be, first, as on every property, a considerable amount of legal service in connection with personal injury suits and with damages to property due to fire and wreck, to loss of property due to shipment of goods, etc. There is a very considerable amount of the time of the legal department taken up in connection with the matters of taxation and the various relations of the corporation and the State, and also a very considerable amount of
117 time given to itercorporate relations between the different railroad companies, matters of passing upon the validity of various contracts and agreements; also prescribing forms in the relations with Interstate Commerce Commission and State Railroad Commission, and in relations with their own security holders. In some cases, the legal expenses would be much higher than .5%.

Q. If it were indicated that the disbursements of the South Shore for a single year—say 1910—for legal expenses in Michigan had been $5,174, and that that is about the high mark, it doesn't go much above that, wouldn't you think it a possibility that you may have gotten your percentage a little high for this particular local condition?

A. No, assuming the correctness of that figure, it would indicate rather exceptional freedom from trouble in operation, but I cannot conceive of any condition so favorable as to permit the building of a railroad across the state, and involving a total expenditure of 15 to 20 millions of dollars, where it would be possible to get out for less than $85,000 during construction of the railroad, especially during the period of grading and track laying. My own experience has been that it required the almost constant attendance of attorneys, to adjust the difficulties that arose with adjoining land owners, the owners of property in the city, and with other railroads, due to the upsetting of conditions that formerly existed, the interference with other classes of business.

I do not suppose it would be possible to ascertain the real cost for legal services in construction of this line. Following out my theory of .5% applicable to the whole property, I would not expect to find any material increase in legal expenses in the expenditure of a large sum for building an ore dock; I do not think, following out my
118 theory, that, when ore dock No. 5 was constructed, the legal expenses should have jumped to .5% on the cost of that ore dock, as the expenses due to fixing the right to build on that location, securing establishment of harbor line, and settling disputes with adjacent property owners was all incurred at a prior time, and this dock was a replacement of the occupied site of ore dock No. 3. In large measure, the rights to build and maintain an ore dock on that location were, and are today, established, so far as the site of ore dock No. 1 is concerned.

I would not imagine there would be very much legal expense in connection with installing a particular dock that would require legal services—possibly, the approval of some contracts. My percentage is .5% upon the entire cost, and is not assignable definitely to any ore dock, depot building or particularly heavy mile of grading. If the ore dock had not been built, the amount would have been less, but I am of the opinion that percentage method is as fair a method as is possible to arrive at these elements of cost. Assuming ore dock No. 5 was not there, it would affect my figures $2,480, less figure placed on dock No. 3. In the event of the building of a new dock, I would not expect the legal expenses to go up in that proportion, as the rights of the company had been established by the expenditure years ago.

In the year, recently, when they bought, say, a half million of equipment, it would be difficult to say whether legal expenses ought to have risen appreciably in that year, as it is difficult to attach any part of the legal or general expenses to a particular group of items, or to determine how much legal or general expense is properly assignable to those items.

When equipment is added, on my method of computation, for the purpose of appraisal, the value of the total property goes up so as to
119 include .5% of the value of the equipment for legal expenses; I have no doubt that the general expenses of the property, as charged to operating expenses, go up.

Q. Why not the legal expenses, then?

A. I cannot say; I don't know anything about the work of the legal

department. I never have made any analysis, and never have noticed the legal item over a period of years, but this is a fact, in every railroad, that there are a large number of employees whose entire activity is devoted to the creating of new properties, the replacement, additions and betterments, whose services wouldn't be needed by the company if the company were not growing and increasing its facilities. The cost of their services goes into operating expenses.

If the company is increasing its property from year to year, say at the rate of a million a year, as is the case with some of the companies, that very fact causes an addition of general offices and clerks, and of employees and of traveling expenses, that directly have to do with this increase of property value. In order to determine the amount of money that goes into the property properly, all of those items should be divided, and then he devote one-half of his time to the building of an addition to the property, his time should be prorated, if you are going to arrive at the actual cost of the new property, but under the I. C. C. classification that is forbidden, so that it results in an increase of operating expenses. If his time was prorated, you could then get a more true figure of the actual cost of the additional property.

The services of employees would be charged entirely to operating expenses, unless the employees were specifically on that construction work all the time.

120 The Michigan 1900 appraisal used 3% for interest, assuming a rate of 6% per annum, and a period of construction of one year. In Minnesota State appraisal, a flat percentage of 4% was applied. I cannot say that I have included something like 20% by named percentages for what was included in Chicago Traction valuation at about 10%. The total of Chicago overhead percentage ran to something like 17% or 18%.

I added in this appraisal for interest on equipment. The interest which is actually paid on equipment would be but a small percentage, due to the short time before completion that the equipment comes to the line; but other items, such as land, grading, and track construction, are in place much more than one-half the time allowed as the time of construction. My percentage is an average.

A three year actual construction period would be required on South Shore, and four years from commencement of incorporation would be necessary; it would be possible to put any part into operation so as to materially decrease interest. The assumption of the Cooley appraisal, that all the railroads of the state, constructed in sections, could be completed within a year, was a violent one, and entirely erroneous. I don't think 3% for interest represented the judgment of the engineers on the work; few of them had given much thought to the subject, or had had to do with organization and financing of properties. I know of no railroad or system built and put into operation inside of a year. I was engaged nearly 4 years in building 23 miles.

The shortest time of construction I know of was the Santa Fe extension from Kansas City to Chicago, 440 miles, in 3.5 years from when they began buying right of way. I constructed 100 miles in Iowa in 13 months actual working time. I don't know about

121 the time taken, there, in organizing and financing. This property would take at least one year in financing and getting right of way.

On 12 or 15 miles, Marquette to Ishpeming and Negaunee, assuming construction of main line, mine branches and docks, to make property available for earning, 3 years is a reasonable estimate. There, the land and grading would be expensive. They could begin to earn revenues in 3 years. In my computations, I have used a 3 year period, but, upon the whole line, a year would be taken in work preliminary to construction.

I accepted Delf's figure of $240,000 as working capital and bills receivable. I think he deducts accounts payable; I told him that was my practice. I do not know as he actually deducted those.

Ordinarily, no fund is created out of capital for stores and supplies. Material on hand at the end of construction appears in stores and supplies.

A road reaches a seasoned condition in about 12 years. The first two or three or four years of the life of a new property, if that property was a passenger road, there would be considerable heavier expenses due to the seasoning of the roadbed, the settlement of the embankments, the washing down of the new slopes and cuts; there would be less expense in the way of renewal of ties, rails, etc. There should be no tie renewal, except to take the place of those that were broken. At the end of 7 or 8 years, the tie renewals would be heavy—perhaps above normal.

122 My percentage for contingencies averages 7.9% on items 1 to 36, varying from 5% to 10%. On construction items, my overhead percentages aggregate an average of 21.9%; on equipment, 19.9%. As certain percentages are figured upon certain of the previous percentages, the overhead is 22.8% of the physical schedules and 18.1% of the grand total of the value for Michigan. Overhead percentages allowed in other appraisals are:

Name of appraisal.	Engineering and legal.	Interest.	Contingency.	Organization or general.	Total.
S. Dakota, 1909.....	4.5	3.0	5.5	1.0	14.0
Gillette, Wash., Nor. Pacific	6.0	5.0	...	...	....
Wisconsin, 1903	4.5	3.0	5.5	1.5	14.5
Wisconsin, 1908	4.5	3.0	5.5	1.0	13.5
Morgan, Minnesota	...	...	5.0	...	....
Darling, Nor. Pac.....	...	...	10.0	...	....
Berry	...	...	10.0	...	....
Hogeland, Nor. Pac.....	...	...	10.0	...	....
Cutler, Minn. & St. L.....	...	...	5.0	...	....

I have not made computations that would show the exact percentage upon the total appraisal. Some of these items were not applied to all items of the schedule. In recent years, Wisconsin has, in a number of appraisals, used a flat overhead of 13% or 13.5%

I have endeavored to make a careful investigation of South Shore; I have been handicapped by lack of time and inefficient records, but I believe my report reasonably free from error. I believe I

have spent more time and gone into more detail than was done on any of the Michigan valuations. I had full co-operation of the railroad and its officers, and full access to its records. My inventory, in many regards, is more complete than the company ever had before.

123 On grading and some of the other schedules, as buildings and structures, it would be possible by a re-survey to make a more accurate inventory than I have made.

My attempt was to make as complete an inventory as time would permit, and furnish as accurate a valuation as it was possible to furnish at the expenditure of a reasonable amount of money. A re-survey of the road could not have been made at an expense under $60 to $70 per mile, which I did not feel justified; such survey, while not capable of giving exact figures, would have disclosed substantially correct figures, and obviated the necessity for use of estimated yards per mile in sidetracks and other points. It would not obviate the use of estimated figures, to take care of overhaul and some other items.

So far as the contingency element applies to the items of difficult construction, bad foundations, expense due to construction in the winter, or weather conditions, or delays to traffic on account of construction or high unit prices by reason of causes that are not now capable of determination, it still leaves a large element of contingencies, and I think that it is unquestionably true that it is fully as difficult, if not more difficult, to arrive at a correct inventory and an accurate estimate of existing property, that has been in existence for many years, than it is to make an estimate of the cost of several hundred miles of standard construction where surveys have been made.

Allowance for contingencies was intended to cover (*a*) error of inventory, (*b*) cost due to difficult construction, and (*c*) cost due to weather conditions, all of which are in South Shore in as large a measure as in property about to be built. I have never known a case where cost of construction did not run in excess of estimated cost as a whole, and I always allow liberally for contingencies.

124 I have endeavored to eliminate all elements of contingencies from the detail of my schedule, except where, in earthwork, I used the Cooley figures as a basis, and there I have added percentages. I think the figures I have given for earthwork actually under quantities that would be disclosed by re-survey. On particular structures, my experience has been that, when work was finished, some of my structures have underrun and some overrun the estimate 10%.

An engineer may make the most careful estimates on the actual physical construction and be substantially correct, and he may carry out that work, and often engineers do carry out work and get comfortably within their estimate of the cost of doing the physical, but other items entirely outside of their control come in on every job, to a greater or less extent; that must be classed as a contingency charge.

Other items of contingency would — extra expense due to (*d*)

demurrage, (*e*) material yard charges, (*f*) strikes and labor troubles, (*g*) securing labor, and (*h*) change of plans.

My article, read before the American Society of Civil Engineers in January, 1911, comprised my views at that time. This article contained the following:

"The Charge of Ten Per Cent. for Contingencies.—Perhaps no single feature of the Michigan appraisal of physical property has been so generally criticised as the charge of 10% of the entire estimated cost, including all the percentage charges, to cover 'contingencies.'

"At the time the first appraisal was made, the writer was not at all satisfied that such an item, in such amount, should be included. The reasons advanced were so strong that it was done, and the writer's subsequent work has fully convinced him that it was proper and justifiable, because:

(*a*) The conditions under which this particular inventory and appraisal were made, as to time and lack of co-operation of the companies, made it practically certain that some items of
125 value were missed in the appraisal, such as station and miscellaneous equipment, frogs, switches, track structures, buildings owned by the companies and occupied by others, etc.

(*b*) That there were many and large elements of physical cost not ascertainable by a physical inspection, such as deep foundations, many thousands of yards of earth in swamps and sink holes (a very general condition of roads in Southern Peninsula), concealed classification due to growth of grass or washing of banks, and many other cases of work actually done, invisible after a lapse of years. The writer knows of many such instances on property which was in his charge many years ago; in several cases there were expenditures of from $20,000 to $50,000 which are now entirely invisible to an engineer passing over the line.

(*c*) The failure on the part of railroad companies to keep anything like a complete history of construction operations, and the changes of operating officials from year to year, cause the loss of record of practically all the expense due to extra hazard and risk which the construction engineer provides for by his 'contingencies.'

(*d*) The inclusion in operating expense, every year, of sums which are properly construction, and which, if added to unit prices of construction work, would cause the cry that such unit prices were too high. For instance, the appraisal estimate on earth was 17 cents per cu. yd., with no allowance for overhaul. Very much of the grade in the State had actual costs far in excess of this figure, and practically every road spends a large sum annually for the first four or five years, which is charged to operation but is in reality a part of the cost of completing the roadbed.

(*e*) No account was taken of appreciation of any of the elements entering into a road. There is no doubt that roadbed, for example, does appreciate, due to ballasting and track work. These items go far toward accounting for the contingencies item on an old road such as the Michigan Central.

(*f*) There is a considerable amount of cost, which cannot be taken

out of capital, where facilities are abandoned or line or grade changed. These changes are common to all growing roads; they are due to the demands for greater traffic; they are necessary to the welfare of the community served; they are often made at points where no charge of defective design will apply. They might be termed expenses due to the development of the State, and, in the development of the railroad business, they were absolutely necessary for its present standard of efficiency. They are incapable of exact and definite determination, and must of necessity be included as contingent expenses.

126 "In the case of a new road, where the exact cost is ascertainable, the records have been fully kept, the original plans are on file, and the history is fresh in the minds of the officials, it will be readily admitted that a charge for contingencies in large amount would not be justifiable; but, in the case of the Michigan Central Railroad, a line more than 50 years old, which has changed, rebuilt, and added largely to its property; in the case of the Pere Marquette Railroad, made up of the union of a dozen lesser properties, without any complete history; in the case of dozens of little lines, without maps, profiles, or records, some such allowance is fully justified and proper.

"The experience of the writer, in the years that have passed since these appraisals, leads him to the opinion that the difficulty of estimating values of an old property are such that in many cases an appraiser might add, with perfect propriety, even more than 10% for the contingency item.

"In computing overhead charges, no allowance was made for working capital, and no addition to the physical valuation was made to cover any such element as 'going concern' value."

I fail to see where it can be said that there is any greater value to the public by reason of the fact that, in the course of railroad construction, strikes occur, or delays to material, or even damages by reason of storm or wash-out; but, in the building of every property, expenses of those kinds and of similar nature are incurred, and the men who are putting the money into the property, to create the property, are compelled to furnish that money and invest it in the property, and it appears to be a properly chargeable expense incident to construction, and to be properly a part of the capital.

The strike and delay, involving demurrage charge and a dozen other items, are misfortunes that are incident to the building of railroads, and, no matter how carefully the organization may have been planned, they are bound to come in, in some form or other, to a greater or less extent, before you get your railroad built; you cannot avoid spending money—more money than you ought to spend,

127 perhaps—for items of that sort, that are in the nature of a misfortune. A strike is a possibility; certain other elements of contingencies are probabilities.

In theory, my item of real estate and right of way includes original cost, additional percentage, and the cost of purchase. The items are fully described in my inventory. I know of no further acreage that should be included. As bearing upon the question of whether

contingency items should be allowed upon the real estate, the contingency item is not assignable to the individual items, nor in the same degree on all items, but is a proper allowance on the whole appraisal. On real estate, a contingency due to the judgment of different men in fixing values must properly be added. If I were making estimate for the purchase of right of way of 6,000 acres, I would, after fixing my values with the utmost care, add a large contingency item.

On real estate values, there is likely to be a wide range of opinion, up and down. It is substantially impossible to separate the contingency item and apply it to the different schedules; it is much greater on some classes of work than the 5% or 10% I have figured, and the effect of its being smaller on some would make a much heavier percentage on others, assuming it were apportioned.

If you undertake to apportion contingency among various items, you must, on some, use a very large percentage, far in excess of anything that has been named; and, over and above all the individual schedules of physical property, are elements of cost that come in by reason of building the whole property, that are not assignable to any of the schedules.

Contingencies on my valuation, figured on Cooley basis, would be approximately $545,000 more than I have allowed; I have
128 allowed $1,196,460. Contingency on my totals, on Cooley basis, must be $1,744,502, and he allowed, in 1900, $1,029,845, and in 1905, $1,110,614. My figures were based upon increased prices and additional property.

All of my prices were proper for 1911, and were in no sense (with small exception) the average of a period of years. My labor prices were figured as of 1911, and grading at 30¢ was a 20% increase over Cooley 1900 prices, and very closely approximates increase in wages of 1911 over 1900. It would have been a fair price as of 1909 and 1910. On grading, I did not attempt to make a mathematical computation from any year's figures. I had contracts of 1907, 1908 and 1909, and knowledge of contract prices of 1910 and 1911.

I made no special examination of the company records for unit costs on buildings, as I found the company had not included in their costs, as reported in their additions and betterments, items of transportation of men and materials and numerous other charges that properly should have been made against buildings. In a great many of the buildings, there are omissions of quite considerable items, and the accounts, as made up, report the actual price of material, without any of the cost of handling or transportation, plus the actual labor cost of men working on the buildings.

I have no doubt that in many of the older buildings the original cost was materially less than my cost of reproduction, and in many cases it might be found that the present physical value is equal to, or in excess of, the original cost. In the last few years, since additions and betterments accounts have been kept, new buildings and replacements have been kept separate, and many are shown in company's additions and betterments accounts. For those, I could get a figure that purported to be original cost, while others show widely

different cost, due to omission of items undoubtedly charged
129 to operation instead of construction. Within my experience in this state, there have been no such sudden or violent fluctuations up or down as would materially affect the cost of the entire property. There has been a steady tendency, in the past 20 years, for prices to go up; there have not been violent fluctuations in that period in any class of material entering largely into permanent way, with certain exceptions.

In structures, obsolescence was taken into account by me to a limited extent only. That is, where a structure built for a superior purpose is now used for an inferior purpose, it was included at the present value for its present use. That applies only to a limited number of minor structures; other than that, I did not take into account, or use, obsolescence in figuring my rates of depreciation.

I have not taken it into account, in any appreciable extent, in bridges, although it might possibly be argued that there was an element of obsolescence there. As long as it is doing the work, in a satisfactory manner, of an up-to-date structure, that would take its place at a greatly increased price, and without excessive maintenance, I do not believe that a company should be compelled to throw into the scrap heap a bridge or other structure and replace it by something more expensive.

In many of the structures, there is no obsolescence. Some structures, such as wooden bridges, can be maintained safely indefinitely and held to 50% condition by replacements; they can be held, by reason of annual maintenance charges, in condition of, substantially, 50%, year after year, and I do not see how an engineer is justified in placing a lower percentage of condition or value because it would be nicer to use a different character of structure.

130 The capacity or strength of some of their old iron bridges is limited, and some of the old wooden bridges could be strengthened for increased locomotive weights and cars with very little money. Most of South Shore bridges are of a type that we would not rebuild today, if we were to build the road new, as they are much more expensive than they were when originally built; and, in the case of many of the smaller ones, the expense of putting in a re-inforced concrete slab, or an arch, would not be in excess of the cost of replacing in kind, or building new, and, to that extent, they are obsolete. They are a form of bridge that was used on practically all the pioneer railroads of the west, a few years ago.

I don't know that I would continue to maintain those structures indefinitely; you reach a point with some of them where the annual maintenance would probably justify new construction. This is not due so much to obsolescence of the type as to the fact that lumber and labor costs have gone up, and having such a bridge involves taking out and replacing members every year.

I have not, in any case, ignored the structure in existence, or depreciated it beyond average depreciation of that class, because some other type of construction might be more economical of maintenance, or might be installed to perform the work equally well, at less cost.

I had recourse to very few sales in Marquette, and my judgment

was fixed, in the main, by inquiry, as to asking prices, value and sales, supplemented by examination of the property, by the values of frontages as given in the Cooley appraisal, which were carefully made by a special appraiser. My highest price for frontage, except on the main street, is $60 per foot. I had no sales on Front St. from which to fix value of $450 per foot.

131 On south line, two tracts are crossed by the railroad, and I included about 13.7 acres; I should say that the purchase of the entire of both pieces would be necessary in building the right of way across the two tracts, and that the payment of abutting damages would more than equal the value that I have placed upon the entire land. This property is so cut, and left in such shape, as to be in the class where the railroad company would be compelled to purchase the whole, as the cheapest way out. There are about ten acres outside the right of way, divided into three triangles.

On water front, I had information as to the asking price on three or four pieces of water front property, one piece near Standard Oil and one around beyond L. S. & I. depot; I do not recall that I heard of any sales in a number of years.

Spring St. produced is used as a driveway or approach to the ore dock, and by the general public, and by employees of the company. If I had known that the company had reported that 40 feet at $1,100, I do not think I would have used it or been guided by it in placing values at Marquette. (Witness' value, $20,000.) While not used as a right of way for track, it is used as a thoroughfare. There is no public street through there, and I would say that it is essential to the company's business to have one. It makes the lowest grade approach from Lake St. to Front St.

My information is to the effect that it was vacated and the company acquired it. I don't think it would have made any difference in the value of my land at North Marquette, at $200 per acre, had I known that the company, in its sworn report, fixed a price of $700 for 22.29 acres there. Water front in Marquette is used by Standard Oil Co. and a number of industries located on South Shore tracks;

132 I know of no other considerable uses. There are more or less fishing boats and minor boats, but nothing that would be considered a use of the water for docks, wharves and other improvements.

Q. (South Shore occupies, according to witness' figures, 4,150 feet of water front.) Assume taking away this railroad and its structures, leaving nothing on water front but Standard Oil, using a small parcel, and small industries mentioned as connected with railroad and serving railroad purposes; what demand would there be to fix any value for this water front, at your figure?

A. The availability of this land for ore dock purposes, and the fact that it can be reached by direct line, would, in my judgment, bring it on the market for railroad purposes within a short time. The fact that it is now occupied by a railroad, shutting off access of other railroads, is a controlling factor in *their* having been no other sales in the vicinity. Remove the condition now limiting the

availability and use of Marquette water front, and the most valuable water front property in Marquette would be put back on the market, and, with two other railroads reaching this city, as now, it would not stay on the market very long. Its peculiar adaptability to transfer ore from cars to boats, and its location, on an improved harbor and in immediate business center of best city in Upper Peninsula, are elements which give it a real value.

133 On November 7, 1912.

RIGGS, recalled by plaintiff.

Further direct examination.

By Mr. Butler:

Complt.'s Ex. 49, Riggs, is an apportionment of property between the different classes of service—freight, passenger and common or joint.

The main line and second track mileage was allocated to joint freight and passenger, and is so used, except from Humboldt to Republic and from Bessemer Jct. to Bessemer, which is not operated regularly by passenger trains. That was included in common property. Branches, amounting to 54.87 miles, were assigned to freight. Passenger car storage tracks and tracks used for washing passenger cars were assigned to passenger. Main line passing tracks, and those leading to shops and roundhouses, were assigned jointly, as common. The great majority of sidetracks, being to freight houses, spurs to mines and industries, tracks to ore docks and mines, and for storage of freight cars, were assigned to freight.

The separate schedules of Complt.'s Ex. 1, Riggs, pertaining to tracks were assigned as were the tracks on which the items occurred. Frogs and switches were divided in accordance with sidetrack schedule, switches to a track, if commonly used, being assigned to common service, and, if used in freight or passenger, being assigned according to the use. Exclusive freight buildings were assigned to freight, exclusive passenger buildings to passenger, and joint buildings to common.

Passenger-train equipment was assigned to passenger, and freight-train cars to freight. Miscellaneous equipment, such as snow plows and work equipment, was assigned to common. The ferries, steamships and locomotives have not been allocated, as many of the locomotives are not capable of definite location between passenger
134 and freight, the same locomotive being sometimes used to haul one class, and then the other. It might be possible for officers of the road, with complete information, to make a fairly definite allocation of locomotives. This would be difficult for one not familiar with the actual service. The records of each locomotive service might be examined, and fairly accurate allocation made. Some of the locomotives may have drawn mixed trains or handled short local passenger trains doing more or less work in switching. The mixed train mileage of the road is very small.

Terminals are allocated in the same manner as other properties. The International Bridge is used by both passenger and the freight services.

The overhead items, being percentage additions, were computed on the amounts apportioned to passenger, freight and common, so passenger service bears its percentage of them.

The results of Complt.'s Ex. 49, Riggs, show:

How assigned or allocated.	C. O. R.	P. P. V.
Passenger	$507,665	$377,133
Freight	5,557,099	4,184,647
Common	13,134,341	11,570,303
Common assigned to Passenger (48.28%)	6,341,260	5,586,142
Common assigned to Freight (51.72%)	6,793,081	5,984,161
Total Passenger	$6,848,925	$5,963,275
Total Freight	12,350,180	10,168,808

The common property has been assigned between the two classes of property on the basis of revenue train miles for 1911. The
135 revenue train mileage is all made on the main line and other tracks used for both freight and passenger trains. The switching mileage, made over main line tracks, spur tracks, and tracks not jointly used, does not go into revenue train mileage. Much switching mileage is done on tracks used in both departments. I am of the opinion that the revenue train mileage is a proper basis for apportionment, as the revenue train mile is the unit of operation, both freight and passenger, and the common property and its maintenance are affected about in proportion as the train mileage.

The heavier and larger units, made up of freight trains, have a certain effect in wear of rail and life of material, but that wear is due in large measure to the fact that curves are elevated for faster moving passenger trains. The larger number of sidetracks used as passing tracks are necessary, because of the more rapidly moving passenger train units, and it would be difficult to fix any definite amount of money or proportion of maintenance of the property assignable to the freight service and not in any way affected by passenger service.

The revenue train mile basis seems to me as fair as any, and gives substantially the same results as revenue locomotive mileage basis. I believe it more fair than car mile basis, as the locomotive has more effect upon the physical property than the passage of any individual car. It might be possible to use a car mile basis, a locomotive mile basis, or a revenue basis.

In my opinion, the same reasons support the propriety of the use of the train mileage basis for the division of maintenance of way and structures items of expense as for apportionment of value between the two classes. In it, weight is disregarded; the lighter pas-
136 senger train being given the same efficiency, as a factor of apportionment, as the heavier freight train. That seems to be fair, as the lighter passenger train requires certain forms of

construction and maintenance of track not used by slow moving freight trains.

The super-elevation of the outer rail on curves is very much greater for tracks used for passenger service than for those used for freight service. The elevation is increased as the train speed is increased; the track gauge is somewhat widened at curves, to permit the passage of wheels around the curve without binding. This increases the wear of the rail, as the elevation necessary for passenger movement is excessive for the freight train, and causes more grinding on the inner rail by freight cars and locomotives. This being necessary for, it is chargeable to, the passenger business.

Speed is an element to be taken into account, as well as weight. The passenger train has the right of way, and freight trains must take sidetracks, with considerable necessary delay, loss in time, fuel and wages, and use of sidings, traceable to the presence of passenger trains.

Both classes, to some extent, haul non-revenue company freight, like track material, fuel and supplies. The company car load freight, and a considerable part of its less than car load freight, is handled by freight trains; also, a very considerable amount of company freight and tools are normally handled on passenger trains, in baggage and express cars; that would be light—of relatively small tonnage. It would be more in the nature of emergency supplies and tools; it is a higher class of service, though tools and a large proportion of office supplies, stationery and smaller supplies are handled on passenger trains. The ton miles of company material handled on freight trains would be much greater than on passenger. In ton miles, the class of stuff hauled by passenger trains would, I think, be practically negligible.

137 The maintenance of way items are due to the use of the tracks and to weather and the elements. Some items, such as maintenance of roadbed, ties, timber, structures, etc., are assignable, in large measure or wholly, to weather conditions, while wear, renewal of rail, frogs, switches, and many structures, and repairs to track (meaning the whole track structure), are due, in large measure, to operation.

Renewal of ties would be necessary, whether track was used or not, and rail renewal is, in some measure, dependent on the action of the elements, but in greater measure on wear; a rail not in use would depreciate as rapidly as a rail in use. In Upper Peninsula, there is very little destruction of ties due to use; it is mostly due to weather and decay.

Expenditure in keeping banks and cuts in order is due to weather. In bridges and trestles, renewal is due to decay. There is in the latter more renewal assignable to use than in the case of ties, but, largely, renewal is due to decay. In culverts, grade crossings, fences, cattle guards and signs, the maintenance is due almost wholly to decay.

Removal of snow, maintenance of snow fences, snow sheds, etc., is due wholly to weather, as is the wooden part of telegraph and telephone lines. The maintenance of buildings, fixtures and grounds

is partly due to decay and partly to use. You cannot definitely assign as between passenger and freight, and it is due, in the main, to weather. Platforms at small country stations would be more affected by weather than by use, while at a busy freight house it is due to use more than to weather. The condition of platforms, as to safety, is required largely by passenger business.

The train mile is the ordinary unit of operation, the activities of the whole road being to move trains, whether consisting of
138 one or of many cars, and the passage of each train, large or small, is an exclusive use of a single line of railroad.

(Complt.'s Ex. 49, Riggs, offered in evidence.)

Complt.'s Ex. 50, Riggs, embodies modifications in Complt.'s Ex. 1, Riggs, made or indicated in direct and cross examination. This indicates a net reduction of reproduction cost of $46,551, and a net addition to present value of $16,618. The addition has not been affected by overhead percentages. Certain additions were made in land values. Deductions were made in the items, bridges, guard rail and spikes, switches, and shops, enginehouses and turntables, and the price of relayer rail in sidetrack was raised from $20 to $24 per ton.

There are no bridges or trestles on sidetracks, except a trestle at Waiska Bay, near Brimley, where the branch is allocated to freight. There are no station buildings or structures of any moment on branch lines. There are a few crossings and very inferior shanties. Exclusive freight buildings indicated on Complt.'s Ex. 49 are all on main line.

Compared with main line track, the track allocated to freight, in the main, receives a small amount of money for maintenance; also compared with main line, or with passing tracks adjacent to main line used by trains in operation. The branch lines are, in the main, reasonably well kept up, and safe for such movements as occur over them. The sidetracks are maintained about as such inferior sidetracks are usually maintained, in a safe condition for the occasional passing over them of trains and cars; and, when maintenance is done upon these tracks, it generally comes in the form of a fairly complete renewal of ties and a fairly complete re-surfacing of the track, and the maintenance is then permitted to accumulate.

139 The sidetrack rail is suitable for the purpose, and will not need renewal for an indefinite period. There is no ballast on these tracks, except sand, cinders or, occasionally, gravel of poor quality. I have considered ballast on sidetracks as earth surfacing, at the price per yard for grading. The tie renewals are much less frequent on such sidetracks than on main line—not that the life is longer, but the movement over them is not so frequent; they are slow switching movements, and they are not required to be kept in as safe condition as main line and passing track ties. The renewal of ties and re-surfacing comprises the principal part of maintenance of exclusive freight tracks.

RIGGS.

Recross-examination.

By Mr. Wykes:

I cannot give you the value of the 173.01 miles of track (corrected to 157.27 miles) assigned to freight, as it must be picked out of the various schedules; it is capable of separation. In property devoted exclusively to freight, I have not included Bessemer or Republic branches, where I think there is no passenger service at present; that has been true as to Bessemer branch for a longer period than 18 months, though on Republic branch passengers are carried on certain trains.

These are included as main line, as both are operated by regular freight trains. I am inclined to think that both should be classified as lines used for freight, and that, in making complete allocation, it might be more fair to include them with the freight tracks than with the joint property. It would be absolutely necessary to so treat the Bessemer branch. Bessemer branch does not carry passengers; Republic branch does. There are no purely pas-
140 senger trains on Republic branch; the passenger business done there is either on freight or mixed trains.

The revenue train mileage is entirely computed on the main line tracks which are assigned to joint freight and passenger; none of the mileage entering into revenue train mileage basis would be made on the 173.01 (corrected to 157.27) miles assigned to freight.

Q. But the expenses, assuming a division of the expenses upon the revenue train mileage basis, the expenses arising upon this 173.01 (157.27) miles would be divided between the two departments upon the basis of revenue train miles made on other parts of the line?

A. I don't know that I have the question. I do not understand that I have testified as to a division of operating expenses; I understand the question to be aimed at operating expenses.

Q. Yes, if you have not, I misunderstood both Mr. Butler's questions and your answers. If you are willing to limit the replies that you have already made so that it will not include operating expenses, I will withdraw this question.

Mr. Butler: I think the question related to the operating expenses, the maintenance of way over which the mileage was made. I did not speak of my memory, but I intended to simply take the opinion of the witness as to the propriety of that factor for the division of the maintenance of the common property over which the passenger and freight train miles used as the factor were made.

A. I don't know that I could testify fully as to the matter of operating expenses. For example, the delivery of a freight train, a train load of ore from Ishpeming or Negaunee to Marquette would certainly include the expense of placing that train either
141 upon one of the sidetracks in the storage yard or, possibly in some instances, upon the docks themselves, and, in going into operating expenses, you have the extremely difficult matter of

undertaking to make separation as to just where the switching movement leaves off and where the expense of the road movement begins. A number of elements come into a computation or distribution of operating expenses that I do not feel qualified to testify upon at all, as I have not gone into the question of either earnings or operating expenses in this case.

Q. Do I understand you, then, to testify that the train revenue mileage basis is proper for the distribution of the expenses?

A. I testified that in my judgment the revenue train mileage basis was a proper basis for the apportionment of values as I have attempted to do in Ex. 49. I do not remember having testified with regard to that basis, or any other basis, in the manner of apportionment of expenses.

Q. If you addressed yourself to a division of the property, and not to a division of the expenses, in your testimony, why was it necessary, this morning, for you to weigh the considerations which made up for the relative expense in the freight and the passenger departments, as you did at some length?

A. My testimony this morning was directed wholly at the one item—maintenance of roadway—and it seems to me that what I said this morning regarding the effect of the passenger train movement and the freight train movement over the road, as it relates to that one item, was proper, as showing why, in my judgment, equal weight should be given to the freight and passenger train mile.

Q. And that testimony was based upon the propriety of the use of the revenue train mileage basis for the division of expenses, was it not?

142 A. Primarily as showing that the passenger train mile and the freight train mile were proper for a division of property and, I think for that particular item, for division of expense.

The question of a division of the property between passenger and freight came up early in my work. I got the idea of the revenue train mile basis after consideration of several basis; in my judgment, that was the most proper. The revenue train mile is a unit often used in railway accounts and statistics. Independent of where it may have been used for division of the common property, it seems to me it is a fair and proper unit.

I would say that I got that basis on a result of a series of conferences with my associates and with Mr. Delf, and others, and I decided to use it because, in my judgment, it has appealed to me as the proper basis. I know of no instance where it has been used in the allocation of property. I don't know that it is the fact that this particular basis assigned to the passenger a larger amount of property than any other basis that can be selected; I am unable to answer you as to that, in full. It does throw into the passenger department more than some of the other bases—I think more than the revenue basis.

Q. Now, I have understood you to say that in the distribution of the items of maintenance of way and structures between the passenger and freight departments the use of the revenue train mileage

basis is approved by you, or do you say now that you don't care to testify on that?

A. I did not, I think, in my testimony undertake to say that that or any other basis was most proper for a distribution of operating expenses, and I merely referred to those items of maintenance of way which were affected by freight movements and passenger movements as being an argument to support the contention that the freight train mile and the passenger train mile were entitled to equal weight in the division of property.

143

It is difficult to fix a definite percentage of repairs and renewals of ties due to train movements or to weather. That has been attempted by engineers, but the opinion of engineers differs, and percentages vary. It also varies on each of the different items entering into maintenance of way. On ties, the greater part of the expense is due to weather and decay, but to say whether that is 70%, 80% or 85% would be difficult, and a matter of opinion. Engineers have undertaken to make such an estimate; I think they ranged between the percentages that I have used—70% to 90%, weather. On rails, the larger percentage of depreciation is due to wear. Any work which has to be done on the grading, cuts or fills, due to settlement and washing of the slope, is chargeable almost wholly to weather.

The surfacing, once done, is by no means finished; it is a continuous operation, and a large part of the charge of repairs to roadway and track is the continual re-surfacing and maintenance of line and track to grade. That is due, in the main, to operation. A re-surfacing of the entire road is necessary every year, and the section men are continually at work, re-surfacing. The expense of maintenance of way and structures is due to two considerations, one of which is train movement.

Q. Now, if the train movement were equal in weight,—that is, if the movement of the unit in each instance were of equal wear on the track, and equally expensive,—it would be unquestionably proper to divide that part of the expense that is due to train movement on that basis, would it not?

144

A. Yes, if you could conceive exact equality——

Q. If it were equal, but we have the situation of dividing the expense of maintenance which — due to train movement upon a revenue train mile in the passenger department as against a revenue train mile in the freight department, if we use the train mileage basis; that is true, isn't it?

A. Yes.

Q. And those two things do not represent the same thing, do they?

A. They do not represent the same thing exactly, in that you may have a train movement in your freight department varying all the way from a locomotive with a caboose up to a locomotive with a long and very heavy freight train, several times heavier than the weight of your passenger train; but, in each case, you have with that train mile unit the locomotive; the wear upon your track and track structures crossed by your locomotive is much heavier than the wear caused by the passing over of any number of wheels of your freight cars or your passenger cars.

The Master: Isn't the wear by a freight locomotive much greater than by a passenger locomotive?

A. Not necessarily. That will depend upon the character of locomotives in the service upon the road. Where your passenger locomotive approximates or equals your freight locomotive in weight, as many of them do, your wear from your passenger locomotive is heavier and your passenger locomotive is running at a much higher rate of speed than your freight locomotive.

The Master: Does it make much difference with the wear, whether the locomotive is drawing a very heavy train or not?

A. It is a very difficult matter to analyze the wear upon your tracks. A freight train on a grade, drawing a very heavy
145 train and moving slowly, will cause more damage to your track in going around a curve than a passenger train followed by a light load moving at a high rate of speed, and that, in a measure, is chargeable to the fact that your curves must be elevated for your high speed passenger trains beyond the elevation that is required for your slow moving freight locomotive, that is drawing its maximum tonnage.

Q. Now, I think, Mr. Riggs, that we are agreed to this point, that the passenger train mile is not the absolute equal in cost of the freight train mile, in cost of maintenance of way. That is, the variation of cost may be on one side or on the other—we are not saying which, now—but the cost of a passenger mile, to maintain that right of way, is not the same as a freight mile; we are agreed to that point?

A. I think I will say that the two are not exactly equivalent, any more than with all freight train miles, that freight train miles made by one train are the exact equivalent of the freight train miles made by another freight train. It is very difficult to tell just what weight should be given to the freight train mile in the matter of expense,—for example, on a single track road,—for the reason that some of the expense of the freight train that is, in the ordinary course of accounting, charged to the cost of a freight movement, is directly traceable to the fact that the road is a passenger road and the expense is made necessary by passenger movements over the road.

The Master: Could you say that one is greater than the other, and, if so, which?

A. Well, as far as the effect upon the maintenance is concerned, I don't know that I would undertake to say that one was greater than the other; either might be greater or might be less.

The Master: But the difference—could you give any idea between what points the difference would vary?

146 A. That would be a very difficult thing to do; your honor.

The Master: Would they vary very much?

A. The freight train mile of the freight train is generally heavy and longer train than a passenger.

The Master: Would they vary 10%?

A. They might vary much more than that.

The Master: I mean between freight and passenger; not between different freight trains?

A. Yes, I would say there might be a greater difference than that.

The Master: But you couldn't tell which would be the greater?

A. No; I am inclined to think that in the effect upon the water of the road, upon a single track line, the train mile should be given about equal weight; that is my judgment.

Q. That is the only judgment that will permit the use of them for the division of common expenses, is it not—that they should be given equal weight?

A. Yes.

Q. If they shouldn't be given equal weight, then you must abandon them as the purpose of the division of common expenses?

A. Yes.

The Master: Would you have to abandon them if you could determine the ratio; why couldn't you take the ratio, and make it the purpose?

A. If it were possible to determine the ratio, it might be taken as a basis.

Q. But they are two different things, are they not; one is a freight, we will say, of 22 cars, and a locomotive and a caboose, and the
147 other is a train made up of three and three-quarters cars and a locomotive, and you are saying, in the use of your revenue train mileage basis, that one of those, in the wear of the track, is the equivalent of the other, and, yet, they are two different things?

A. I do not know; I do not think that I have in mind, now, figures as to the average train.

Q. I have given you about the ratio; it may be four instead of three and three-quarters, for the passenger?

A. In the one case you have a train that is made up of a larger number of cars, some of which are loaded, some of which are empty, and some of which are light, with a light caboose, moving at slow speed; in the other case you have a train varying from three to six or seven cars, with a locomotive substantially equivalent in weight to the freight, with cars that are longer and heavier, with a very much higher rate of speed.

The Master: Could you give any idea what part of the wear of those two trains comes from the locomotive, and what from the cars?

A. Well, I haven't gone into that, your honor, at all. The greater part of the wear of the train is due to the locomotive. As I said this morning, I haven't gone into the question of the weights of locomotives used in the various classes of service on D. S. S. & A. Some of the heaviest locomotives they have—some of the heavier and more modern locomotives—are used in passenger service, and some of their older and lighter locomotives are used in freight.

The Master: Assuming they are the same weight, can you form any idea as to whether this freight train, of 22 cars, would cause any greater wear on the track than a train of four passenger cars?

A. The high speed passenger train would cause more wear, or would be apt to cause more displacement.

148 The Master: I mean now the cars, supposing the engines are the same weight?

A. I don't know that I can answer that, your honor.

The Master: What I was getting at was this: If the locomotives

are the same weight, and have the same effect upon the track, would there be any considerable difference between the two trains with regard to the cars?

A. I don't think there would be any appreciable difference, and I think that the rate of speed in one case would tend to offset the greater number of blows given to the track by reason of larger number of wheels in the other train.

Q. When you say there wouldn't be any appreciable difference, you mean to weigh on each side all of the elements that make for wear of the track?

A. Yes.

Q. Against all of the elements that make for the wear of the track on the other side.

A. Yes.

Q. You wish to say that, taking into account the weight, the speed, the starting and stopping, and all of those things, the train mile in one department is about the equal of the other? But you don't mean to answer, that there is no more wear from the 22 freight cars than there would be from three or four passengers cars, excluding all other elements?

A. I think, taking that question as a whole, I would answer the first part of it, yes, and the second part. no.

Q. Now, there are conditions and things attendant upon the movement of a passenger train which make that movement more
149 expensive than the movement of a freight train, even though the freight train has more cars, are there not?

A. Yes.

Q. The speed that you mention is just one example on that side. There are on the other side things which make the movement of the freight train more expensive on that side of the proposition?

A. You have reference, now, to the effect upon the track, or cost of operation of the train itself?

Q. I have reference to the entire wear due to the train movement, the thing that you have testified, maintenance of way?

A. Yes.

Q. Now, there is no way, is there, that we can with certainty determine what proportion of the cost is due to the speed in the passenger department—how much that increases the maintenance of way expense attributable to that department?

A. I do not believe that it would be possible to give exact value in this case to the speed, or to the weight in the freight department, or to the pounding of an extra number of wheels in the freight department, without a very careful study of local operating conditions over a period of time; I would not undertake to fix any value to those elements without access to a very large amount of information not obtainable, and I do not know that, even having it, I would undertake to do so.

Q. Do you know of anyone who has ever undertaken that?

A. No.

Q. Isn't it true that, in the investigations you are familiar with, the

expert has rested his conclusion upon those things in his judgment, and not in the fixing of percentages?

150 A. Yes, I think that is, in the main true, largely for the reason that exact information is difficult of ascertainment, if not impossible to secure.

Q. Have you ever made any investigation of the life of rails upon a road devoted exclusively to freight business, or almost exclusively to freight business, as against one having a large passenger traffic?

A. I have given a good deal of attention, the last few years, to the subject of the life of rail. I have gone far enough into the subject to know that there is very iittle data available to the engineer in general practice, as I have been, and that there is a vast difference in the life of rail on different roads, as between straight track and curved track, as between the inside and outside rail on the curve, and as between rail on level track and on grade. There has been an immense amount of investigation reported to the different railroads that, if it were analyzed, if it had been analyzed by the different engineers familiar with each local condition, and tabulated, would unquestionably be of great value; but such anaiysis, in most cases, has not been made.

The Master: Any of it on roads used exclusively for freight?

A. In some work that I did a year ago, on the Buffalo, Rochester & Pittsburg Railroad, a road which was used exclusively for freight, and a road having a tremendous tonnage per mile of road, I got some figures that were fairly definite; but that case is not at all comparable with D. S. S. & A., for the reason that the Buffalo, Rochester & Pittsburg has a great many times—25 or 30 times the tonnage, per mile of road, that South Shore has.

Q. The rails have a very short life on that road?

A. The rails have relatively a short life on that road; I haven't enough data that would enable me to fix the life on rails based

151 upon the tonnage over them, but the use of the road by trains—the tonnage over the rail—is unquestionably a large factor in the life of rails; whether the rail is on the main line, with heavy or light traffic, on branch line or side track, would so affect the life of the rail, and wear of the rail, that it is very difficult indeed to fix any average figure that would be fair to apply.

Q. Then, weight and the number of wheels is just as important a consideration as speed?

A. Well, all of the conditions, weight, the number of wheels, speed, the number of curves, and whether the track is on level or on light or heavy grade, all enter into and affect the life of rail. For example, there is one curve on the Buffalo, Rochester & Pittsburg where the life of the rail is less than a year, while there is other track in the main line, nearby, where the life of the rail is 10 or 12 years.

RIGGS, recalled.

Further recross-examination.

By Mr. Wykes:

Riggs' apportionment of mileage of track in Michigan between freight, passenger and common, as corrected, is as follows:

152

Character of track assigned.	Exclusive passenger.	Exclusive freight.	Common.	Total.
Main Line:				
Owned	....	.....	420.18	420.18
Joint	....	.....	.83	.83
Branch Line:				
Owned	....	52.85	.....	52.85
Joint	....	2.02	.....	2.02
Second Track:				
Owned	....	.....	5.08	5.08
Joint	....	.....	.74	.74
Sidetrack:				
Owned	.77	87.49	30.79	119.05
Joint	.85	13.65	.71	15.21
Terminal:				
Joint	....	1.26	.26	1.52
Total	1.62	157.27	458.59	617.48
Joint tracks, operated over, but not assigned to D. S. S. & A.....				21.53
Total Michigan trackage operated over.....				639.01

I have used revenue train mile basis for apportionment of common property and tracks used by freight and passenger, as given in Complt.'s Ex. 49, Riggs. I do not think it possible to use any basis for this division which would not be open to argument, opposition or criticism. I believe the revenue train mileage basis represents most closely the use of property.

Revenue train mile basis is computed on main line movements, as no part of revenue train mileage is made on tracks definitely allocated to freight or passenger. The question of time required for a passenger and a freight train mile is an element, but not very strong. I believe the freight train mile is substantially equal to the passenger train mile. It would make no difference that
153 freight train mile uses property twice as long as passenger, assuming both to be operating on a clear track. A slow moving train interferes with more trains than a fast one, while more track must be kept clear for the latter.

The reason that I make train movement the unit is that it is an exclusive use of the track. I cannot see that time is the determining

criterion, because part of the time the track is not in use. The unit of use is the train mile. If you assigned 12 hours a day for freight service alone, one-half of the property would be assigned to each. In such a case, time would be of more influence than as the schedules actually exist.

If it were possible to ascertain the actual time the property was used by each class of service, time would enter into the division more, but other elements, such as increased cost, delays, etc., must be considered. These other elements are also questions of time, however. It is not necessary that you know the speed of different classes of trains in order to say that a passenger train mile is equal to a freight train mile.

In the division of expenses of maintenance, considering the unit of division to be the train mile, to say that a passenger train mile equals a freight train mile, we must know the relative speed and weight of trains, number of car wheels and cars, and weights of locomotives. All should be studied before you can answer that the revenue train mile basis is proper for a particular road. The same elements that make certain classes of wear in freight service are also present in passenger, but some elements present in passenger service are not present in freight service, and vice versa.

You are weighing different elements against different elements, to some extent, but not entirely, for the greater part of the
154 stresses upon the tracks are due to locomotives and the first pair of drivers. For this reason, locomotive mileage is a very fair one. The locomotive mileage, generally, is about the same as train mileage.

Switching miles should be the same equivalent to the distribution of these amounts as miles that are not switching miles. Part of the cost of maintenance is due to wear and part to decay. The reason all should be divided between the two departments on the basis of train movements is that all the roadway, if not actually engaged in transportation, is incidental to the track. For that reason, whatever is the best basis for dividing track expenses should be used for other maintenance of way expenses. Any basis correct for the major items should be applied to minor ones.

As long as a road is maintained, and necessary, renewals of ballast are made, to keep the road in the most efficient condition. It cannot be said that ballast depreciates, but, if it is allowed to become mixed with dirt and is not renewed, you might say that it has depreciated. The replacement is not a betterment, except where the amount under the ties is increased.

I valued the car shop at Marquette at $20,736 ($1 per square foot), which includes everything—piping, lighting plant, etc. It was finished a short time before my appraisal. I examined the additions and betterments account, but applied a flat price of $1 per square foot to it, as well as to the stone shop building at Marquette, the rail sawmill, building, etc. I used that price on a large shop building of brick and stone, and on many smaller buildings, though the reason was different.

That $1 unit was per square foot. In the 1900 appraisal, we used

a cubic foot unit. I used the square foot, because it is much easier to ascertain. The square foot basis is fair on the great bulk of railway buildings, as they are generally of uniform height
155 and construction. The total book cost of that shop was about $16,000, but book charges do not include salaries of engineers, transportation of materials and other items which it is impossible to charge to particular work. That is true of any shop structure, but not so true of a depot or other building not used by employees of the company of the class that use this shop.

I did not examine the accounts with reference to specific buildings, but made general inquiries. It would be fair to say that in many cases transportation of material is not charged. Even *in* such items were charged here, I should not change my estimate, unless the total cost of the building was analyzed. In some cases, the cost of buildings which are identically alike vary.

There are about 150 (157.27) miles of track on which there is no passenger operation, and on which there is no train mileage which enters into the revenue freight train mileage. By the application of the revenue train mileage basis of division of the expense of maintenance of this 150 (157.27) miles, we assign the expenses of its maintenance on a train movement that doesn't occur at all. To make the division correct, it would be necessary to allocate the expenses of maintenance of that 150 (157.27) miles. The proportion of expense would be small. My percentage of condition is as high on these spurs, sidings, etc., as on main tracks, but the standards are different. The sidings and spurs assigned to joint use are kept in better condition than those assigned to freight only, except those freight lines to mines over which locomotives run often.

There are about two miles of track assigned exclusively to passenger use, consisting of Marquette depot tracks, etc. There are
156 a few buildings devoted to passenger use only, but they have small relative value. The exclusive freight tracks are feeders for the business of the main line. There are no passenger tracks which compare with these freight tracks, other than the two miles mentioned, and even the latter are not really comparable.

RIGGS.

Redirect examination.

By Mr. Butler:

The mileage statement and apportionment given, I believe to be correct, although I may be mistaken on minor tracks.

When I used the term "surfacing," I referred to the original work that is done to put the track in shape for operation. Re-surfacing is never a capital charge. Section men generally do re-surfacing, by fixing the joints and tamping the tracks.

The amount of maintenance due to use or to weather varies with the character of the structure, drainage, topography, soil and climate. Weather stress is much less upon concrete, iron or steel than upon wooden structures. The more permanent the material, and the

higher the class of structure, the less the depreciation by weather. Renewal of rails is due almost entirely to use, though weather is a heavy item in breaking of rails. The character of track maintenance, ballast, continuous joints, and other equipment, is due in considerable extent to passenger service, and they would be of a lower grade on South Shore for freight service only.

The outer rail on curves on level tracks wears out much quicker than the inner rail, though, on sharp curves, the head of the inner rail grinds off. The life of a rail is also shorter on a grade than on the level. With the limited knowledge of the subject so far
157 obtained, it is impossible to state any fixed formula for estimating the relative wear under different conditions, but it is well known that the wear is greater on curves and grades. The super-elevation of outer rail on South Shore is in no case extreme, the maximum being about three inches, while the degree of curvature is three or four and sometimes five. Such track is suitable for a speed of 45 to 50 miles an hour.

Freight trains do not usually go that fast around curves, and the tendency is therefore to wear off the head of the inner rail. It is practically impossible to adjust super-elevation to suit all traffic, but such elevation is necessary for safety from overturning at the curve at high speed. There is a tendency for the flange to climb the rail, and for the train to topple over. Rails do not break from the strain as often as do flanges, on account of the outer rail not being elevated enough. If heavily loaded cars go around a three degree curve which has a five inch super-elevation, at only 10 miles an hour, the flanges grind the inner rail, which has a tendency to tip over.

The revenue train mile, both freight and passenger, was performed wholly upon the tracks which were assigned to both freight and passenger business. The engine mileage performed on the exclusive freight tracks is called a switching mileage. As a rule, a train occupies, to the exclusion of all others, the space between two nearest stations. Passenger trains generally have precedence, and freights must often sidetrack while a passenger train goes by two or three stations.

Tractive power of locomotives depends on weight, size of cylinders, and size of drivers. Other things being equal, tractive power increases with the size of cylinders, stroke, boilers and drivers.
158 If one passenger train and one freight train each way, every day, go over a stretch of track protected by cattle fence, the expense of the fence would, on the revenue train mile basis, be equally divided between passenger and freight. If the freight train earned nothing and the passenger train earned $10, and the expense were divided on the revenue basis, passenger would have to pay the entire cost of the fence, though freight would have equal protection.

On November 16, 1912.

RIGGS, recalled.

Further direct examination.

By Mr. Butler:

In fixing unit price on country lands, I have not attempted to fix values on individual pieces, but average prices which are in my opinion fair and conservative, taking into account:

(*a*) The fact that the consideration paid for a narrow strip of land always exceeds, by from 2.5 to 6 times, the acre price of ordinary sales in tracts of such size as are sold in usual business.

(*b*) That cost covers the value of the land taken and severance damages to the remainder of the tract.

(*c*) That the land is available and demanded for railroad use.

(*d*) That the cost to railroad company, in addition to consideration paid owner, covers abstracts, expenses and salary of right of way agent, entry fees, recording deeds and contracts, expense of attorneys, courts and juries in condemnation.

159 RIGGS.

Redirect examination.

By Mr. Butler:

Assuming maintenance of railroad, its roadbed appreciates greatly by lapse of time, and that was taken into account by me in saying that cost of reproduction new was to be the value.

On February 25, 1913.

RIGGS, recalled.

Cross-examination.

By Mr. Wykes:

I may have said in testimony that the cost of maintenance of ore spurs and branches would be, per mile, substantially as much as main line and main line branches, by reason of the rougher usage to which the tracks were put and the heavier movement over them. I don't believe it possible to make any definite separation of the cost of maintenance of these tracks from any company records.

On sidetrack and spur construction, I took into account maintenance condition in fixing my percentage of present condition. On them, I used a lower percentage than on main line. The Bessemer and Republic branches and south line, Eagle Mills to Winthrop Jct., were treated as main line. As to proportion of cost of maintaining

main line, what it would cost to maintain industrial tracks would depend on the service and the number of movements.

I think, in general, it is fair to say that on any secondary track the maintenance per mile is less than main line track. The practice of many railroads is to consider 2 or 2.5 miles of secondary track or siding equivalent to a mile of main line, in arrivng at an average figure per mile on maintenance, and some of these tracks will unquestionably have very little money spent upon them annually
160 for maintenance, while others will have a very considerable amount. I would expect to find much more money spent per mile upon such a line as Palmer branch than on Deranson lumber spur, or other lumber spurs on west end.

On such lines as Palmer branch, there are a large number of movements, and they are in the sense of mine movements over them. There is considerable operation on those tracks, and there might be more frequent movement and more tonnage over them than on some parts of the main line; e. g., parts of the line west of Nestoria; I don't think that would apply to the whole line. Other parts of the line having nothing over them but regular trains, while the mine spurs have a large movement of ore from the mines to the main line.

In Complt.'s Ex. 49, Riggs, I allocated south line, Eagle Mills to Winthrop Jct., as common main line. There is on a portion of that track (south line, Eagle Mills to Negaunee) a very considerable part of main line freight train movements. It is operated, really, as a part of second track; for that reason, I classified it as main line. The passenger station at Ishpeming is on north line, a mile or more away from south line, so that all of the passenger train main line movements are, I think, over the north line.

I have treated the south line, Negaunee to Winthrop Jct., as main line, common between passenger and freight. I think the same is true from Eagle Mills to Negaunee. I think it might be proper to exclude from common track such portion as is not used in regular main line movement; I think it would be proper on that portion of it that is treated as main line and used by main line freight trains, thereby relieving the north line and saving the necessity of second track, the same as the rest, even though there were no passenger movements over it; that is because it relieves the other track.

161 These eight miles of line would necessarily be assigned to the freight business if you strictly exclude everything that is not operated on by passenger trains. My theory of treating it as common is that it is, in effect, a double track and relieves the main line, leaving it free to passenger traffic to a greater extent than if these freight trains ran over it.

The north line is single track from Marquette to Eagle Mills and double track from Eagle Mills to Negaunee. There are three lines of rails from Eagle Mills to Negaunee. All passenger movements, both east and west bound, are over the north track, and pass the passenger station at Ishpeming.

The 8.7 miles, Humboldt to Republic, I treated as common main line; also the 2.23 miles, Bessemer Jct. to Bessemer. If there is no passenger traffic on that, it would, under a strict allocation, come out.

Between Winthrop Jct. and Marquette is practically the only double track line on South Shore; in part, there are three tracks there. This is made necessary by the large amount of train movements due to the ore business and operation of C. & N. W. and C. M. & St. P. trains over the track; all those conditions unite to make that a very congested district.

RIGGS.

Redirect examination.

By Mr. Butler:

With minor exceptions, the main line tracks are used for both freight and passenger trains. Refinements in construction and adjustment made necessary for faster moving passenger trains increase the maintenance charge over what it would be if the tracks were used by freight trains alone; that extra sum is undoubtedly substantial. The spurs and sidings not used for passenger trains
162 are not subject to refinement necessary to keep the tracks in safe condition for passenger trains, nor are they subject to the extra cost made necessary thereby. Other things being equal, except the use, the maintenance of such spurs and sidings would necessarily be less.

The sidetracks were estimated on the basis of relaying rail. That is not true of tracks not included in Schedule 16, Sidetracks. It was assumed that relaying rail could be used indefinitely in these tracks, and would not need renewal; theoretically and practically, there is, therefore, no rail renewal. Ties are not so numerous, being 3,000 to the mile on main line and 2,640 on sidetracks. The ties in spurs to lumber yards and sidings would not require as frequent renewal as in main line, and they are cheaper—culls; they could be used until they practically rotted away. On these spurs and sidings, there is no ballast, except sand or earth surfacing; so the item of ballast maintenance would be eliminated. What is true of rails, ties and ballast would be true of the item "other track material."

There are practically no bridges, trestles or culverts, and only a small amount of minor drainage, on these spurs, branches or sidetracks; so the expense of their maintenance would be practically eliminated. By far, the greater portion of maintenance of bridges, trestles and culverts would be exclusively on main line. On these branches, sidings and spurs, there are some grade crossings, but no fences or cattle guards. What grade crossings there are would not be kept in as good condition as on main line, except in some of the cities—Ishpeming and Negaunee.

There are no snow fences to any extent, and no signal or interlocking plants, or telegraph or telephone lines, and no buildings. The expenditures for roadway tools and supplies would be in about the same relation as work and material put on the spurs, branches and sidings.

163 The principal items in maintenance of main line are ties, rails, ballast, bridges, trestles and culverts, buildings, fixtures

and grounds, other track material, and repairs to roadway and track. The expenditure on the branch lines, sidings and spurs, for roadway and track, would be much less per unit of distance than on the main line.

Usually, in computing mileage for a determination of maintenance cost per mile, 2 or 2.5 miles of branch and secondary line or sidetrack is considered as one mile of main line. That would be all sidetrack mileage of the road; it would be a much greater proportion for a spur to a lumber yard, because the amount of money spent on a mile of main line passing track would be much more than spent on one of these lumber *of* spurs. The maintenance of a main line passing track would probably be, per unit of distance, six times more than the maintenance of a spur going out to an industry. I think it would be impossible to get exact figures for the cost of maintenance of exclusive freight tracks, unless that information were specially desired and separated.

RIGGS.

Recross-examination.

By Mr. Wykes:

Of under and overhead crossings, there are two or three at Marquette; they are for carrying over the freight tracks.

When I said it might cost six times more to maintain a passing track than a sidetrack to an industry, I did not mean to include in the sidings the important mine spurs, as I should classify some of them as fairly important tracks, with frequent movement and more maintenance. Some of South Shore spurs have such traffic over them that there must be considerable maintenance in order to keep them safe.

164 I cannot say that South Shore is ballasted beyond the point of good practice, or even up to good practice, but there is more ballast on the road than if nothing but freight movements were made over it. The ballast has the tendency to lengthen the life of the ties. I do not think that the expenditure of $2,507 for ballasting on South Shore in Michigan in 1910 was more than would have been put there had the road been engaged only in freight service.

On November 28, 1913.

RIGGS, recalled.

Further direct examination.

By Mr. Butler:

Complt.'s Ex. 1*a*, Riggs, is Riggs' second appraisal of D. S. S. & A. It is a revision of Complt.'s Ex. 1, Riggs, and excludes property not in existence June 30, 1913, and includes additions and betterments to June 30, 1913. The property is allocated to exclusive passenger,

exclusive ore, exclusive freight (other than ore), common freight and passenger, and common ore. The summary includes ore and freight under caption "Freights." The arrangement, in general, is the same as Complt.'s Ex. 1, Riggs.

Complt.'s Ex. 1*a* covers the entire ground of Ex. 1; where the structures remain unchanged, totals only are carried into Ex. 1*a*. Where a structure remains unchanged, Complt.'s Ex. 1 must be referred to for the details. Complt.'s Ex. 1*a* relates only to Michigan property. No lands or overhead charges on lands are included in Ex. 1*a*. The figures in the summary, sheet 1, are based on Ex. 1, modified by examination of the property made this year, and relate to June 30, 1913.

165 While, in one or two schedules, there have been some changes of unit prices, in the great majority of schedules they remain the same. Corrections have been made in some of the schedules. The inventory is based upon two inspections made this summer (1913), partly by me and partly under my direction, whereas, for some of the schedules in Ex. 1, I depend on company records. In this case, we have made an inspection and inventory in the field. The purpose, among others, was to get the deductions and additions between June 30, 1911, and June 30, 1913, and to note errors of omissions or inclusions of first appraisal.

The schedule of culverts and minor waterways in Complt.'s Ex. 1 was based on office notes of the superintendent of bridges, without detailed inspection. Mr. Hansel used my figures for culverts.

Our inspection was made to bring schedules to date, and to give an inventory of minor waterways. Messrs. Baily and Cadarette, who assisted in the inspection, reported to me the result of the field work; I was in constant touch with them while on the inspection. All matters coming up during checking of schedules were referred to Mr. Cadarette, and quite a large number of structures other than bridges were measured and checked by him.

The totals on summary sheet, page 1, cost of reproduction, $17,584,369, and present physical value, $14,602,343, include no real estate or overhead charges thereon. In my opinion, the summary statement is a fair statement of what it purports to be; also the allocation between the different classes of business.

In Complt.'s Ex. 1*a* are corrected certain errors of Complt.'s Ex. 1; e. g., water and fuel stations at Soo were included in en-
166 tirety, while there should have been included only one-half interest; three or four structures which existed in 1911 were omitted. The total amount involved is not large; these additions and deductions are not specifically described as being corrections to Ex. 1.

To ascertain the value of the property as of June 30, 1913, there is no occasion to refer to Ex. 1, except for details.

Page 2 of Complt.'s Ex. 1*a* is a summary comparing Complt.'s Ex. 1, Defts.' Ex. 15, Hansel, and Complt.'s Ex. 1*a*. In comparing, I did not correct percentage items of Hansel or 1911 appraisal, by excluding percentages on land. On sheet 2, the 1911 appraisal is as corrected by Complt.'s Ex. 50, Riggs.

Pages 3, 4 and 5 of Complt.'s Ex. 1*a*, Riggs, relate to mileage. The differences between the mileage as of June 30, 1911, and June 30, 1913, is analyzed, showing:

Soo to Marquette, increase, branch lines	7.43	miles
St. Ignace to Soo Jct., decrease, branch lines	.05	miles
Marquette to Houghton, decrease, branch lines	.42	miles
Marquette to Houghton, decrease, branch lines (joint)	.22	miles
Nestoria to state line, increase, branch line	8.67	miles
Net	15.41	miles

This increase has been built since the 1911 inventory.

Pages 6 to 9 of Complt.'s Ex. 1*a* shows grading, clearing and grubbing; this is divided to freight, passenger, common freight and passenger, and iron ore; the iron ore and freight are separate, but have been added to carry into the summary on page 1.

Throughout the schedules in Complt.'s Ex. 1*a*, the word "freight" excludes ore; the term "ore" includes that handled in ore trains to Marquette from the mines, and takes no account of property
157 used for ore carried in freight trains to other points than Marquette docks. "Exclusive Freight" includes ore moved over other parts of the line than from mines to Marquette. The ore property, as I have segregated it, as exclusively used for the ore business, all lies at Marquette or between Marquette and Beaufort Jct., on the main line.

I have made comparison of schedule 3, Grading, Clearing and Grubbing, between Complt.'s Exhibits 1 and 1*a* and Defts.' Ex. 15, Hansel. For this schedule, I used the same unit prices and quantities in 1911 and 1913, with increase in 1913 due to addition of 15.41 miles of branch line. The increases are:

Grading, 15.41 miles new branch line	123,280	yards
Grading, filling trestles	131,500	yards
Clearing and Grubbing, 15.41 miles branches	92	acres
Increase, C. O. R., due to above	$83,794	
Increase, C. O. R. net ($3,500 deducted due to elimination of retaining walls)	$80,259	

The difference between Complt.'s Ex. 1 and Defts.' Ex. 15 is accounted for almost entirely by difference in unit price for earth.

The comparison of unit prices and quantities is as follows:

168 Earthwork.

Unit Prices.

Description.	Riggs, 1911.	Riggs, 1913.	Hansel, 1912.
Earth	$ .30	$ .30	$ .20 .26 .40
Loose rock	.50	.50	.50
Solid rock	1.35	1.35	1.35
Shrinkage	.30	.30	.25
Clearing	40.00	40.00	40.00
Grubbing	100.00	100.00	100.00
Masonry	10.50	10.50	8.00‡
Dry Stone	9.00	9.00	8.00‡
Excavation and backfill	.30	.30	.50
Excavation in cut	.30	.30	.26
Timber, per M	36.64	36.64	38.00
Piles, per foot	.40	.40	.40

Hansel Valuation	$2,442,311	$2,419,763
Riggs 1911 Valuation	2,879,484	2,855,596
Riggs 1913 Valuation	2,959,743	2,935,985
Riggs 1913 increase over 1911	$80,259	$80,389

Increase accounted for:

Grading on 15.41 miles new line, 123,280 yds. at 30c	$36,984
Clearing and Grubbing, 92 acres	7,360
Filling Trestles, 131,500 cu. yds. at 30c	39,450
	$83,794

Some retaining walls renewed; one cut out. Some minor grading at small culverts, to adjust amounts. No addition made on account of widening cuts and fills.

‡For concrete.

169 *Comparison of Grading Yardage as Computed by Riggs in Complt.'s Ex.* 1 *and Hansel in Defts.' Ex.* 15.

District.	Earth.	Loose rock.	Solid rock.	Shrinkage.	Overhaul, crossings, etc.
Riggs' estimate of cubic yards:					
Soo and St. Ignace to Marquette	2,247,961	31,041	15,162	208,379	156,284
Marquette to Houghton	2,448,907	134,688	45,096	231,394	173,546
Nestoria to state line	1,666,295	18,156	9,078	154,954	116,215
Total	6,373,163	183,885	69,326	594,727	446,045
Total Riggs' Estimate					7,667,166
Hansel's estimate of cubic yards:					
Soo and St. Ignace to Marquette	2,413,100	26,900	24,800	138,000	73,300
Marquette to Houghton	2,410,100	122,200	63,400	193,600	91,000
Nestoria to state line	1,805,900	24,900	7,600	141,100	22,000
Total	6,629,100	174,000	95,800	472,700	186,300
Total Hansel's Estimate					7,557,900
Riggs' total yards					7,667,166
Hansel's total yards					7,557,900
Difference					109,266
Riggs in excess of Hansel					0.01–446/1000%

Applying Riggs' price to Hansel's yardage:				Complt.'s Ex. 1.
Earth,	6,629,100 square yards at $ .30	$1,988,730		$1,911,949
Loose rock,	174,000 square yards at .50	87,000		91,942
Solid rock,	95,800 square yards at 1.35	129,330		93,590
Shrinkage,	472,700 square yards at .30	141,810		178,418
Overhaul,	186,300 square yards at .30	55,890		133,813
		$2,402,760		$2,409,712

170 In assignments of property to different classes of the service, we have assigned to common, grading, etc., and other structures on main line, passing tracks, and other tracks jointly used by freight and passenger trains or by freight trains in getting out of the way of passenger trains. We have assigned to freight, grading, etc., in all of the yards; also on all branch lines except Republic branch, which is figured as main line, used for both. To ore is assigned all branches to mines between Marquette and Beaufort Jct.

The basis is the use, and roadbed used for freight is assigned to

freight, for passenger to passenger, and for ore to ore, including the fixed structures of the roadway.

Page 9 of Complt.'s Ex. 1*a*, Riggs, contains a recapitulation showing amounts allocated to different services for grading, clearing and grubbing. (Witness re-states amounts from that page, and states they are fair present C. O. R. and P. P. V.)

The following statement shows the average unit prices used by me in each of my appraisals and the unit prices used by Mr. Hansel as to the schedule of ties:

Unit Prices.

Riggs average, 1911 Valuation	$.3477½
Hansel "	.40
Riggs " 1913 Valuation	.40

170*a* *Average Prices of Ties of Each Kind—5-year Period.*

	Cedar.	Hemlock.	Tamarack.
1909	46.41¢	38.47¢	33.31¢
1910	41.91	30.14	30.47
1911	33.27	28.81	27.49
1912	34.13	30.57	29.84
1913	37.95	33.33	32.02
Average, 5 Years	38.73¢	33.77¢	31.04¢
Handling	5.5	5.5	5.5
	44.23¢	39.27¢	36.54¢

I have increased the price of the ties from 3477½ cents to 40 cents, my reason being that the price of ties at the present time and the average prices of ties for the period of the last five years all justify this increase. I am assuming the same kind of ties, and am using in this case a figure that happens to be the same as used by Hansel in 1912, which makes an increase, in round figures, of 5¼ cents per tie. The average price referred to by me was arrived at by taking the total number of cedar ties purchased by the D. S. S. & A. each year, and the total amount of money paid for them, to arrive at the average for the year of the cedar ties, and the same as to hemlock and tamarack, and using these three averages to produce the final average.

Pages 50 to 52 of Complt.'s Ex. 1*a* contain schedule 10, Ballast. There is an increase, in 1913 over 1911, of $10,850, in cost of reproduction. The difference between 1911 and 1913 accounted for 600 yards per mile of sand ballast at 30¢ on 15.41 miles additional line. I have made no increase in value of ballast due to extensive re-ballasting west of Marquette. There, a large mileage of main line has had additional ballast put on, and it has been brought to a very much better condition; there has been quite a large addition, by reason of

widening cuts and fills, but no increase has been made except on account of the additional lines.

I have estimated ballast at a maximum of nine inches under the ties, and, if there happened to be 48 inches under the ties, it
171 has not been considered as ballast. There, clearly, is an increase in value, or in the condition of the track. The track west of Marquette was fully ballasted prior to 1911, and the work done since puts on an excess amount of ballast—more than I have computed as the maximum for the standard of construction that I have used. I don't know that I should regard what has been put on as maintenance. I don't add for that excess ballast.

We have allocated to common passenger and freight, all stations where the station building serves the purposes of both. Where there was a freight room and a passenger waiting room, ticket office and telegraph office, that building has been assigned to freight and passenger, together with the platform. At some smaller stations, such as Champion, where there is a building used exclusively for passenger service, we have assigned them to passenger, notwithstanding the fact that the Marquette building, and, to some extent, all of them, are common, in that they have a telegraph office. We have not made separation by reason of the telegraph office, nor at Marquette station on account of the offices. Some of the buildings assigned to exclusive freight also have telegraph offices used for both departments and for the public.

In buildings having a freight room, a passenger room, a ticket and a telegraph office, I have not attempted to apportion between freight and passenger. We started to study the possibility of apportioning those buildings on the basis of the number of square feet of floor space. Those figures were not turned over to me. At Marquette, there is an exclusive freight depot and a passenger station. On the second floor of the Marquette passenger station are the offices of the superintendent, car accountant and others, in which business is conducted for both departments.

172 It is difficult to make an assignment of that building; it would be manifestly improper to make an allocation on the basis of square feet of use, as the building is primarily, essentially and mainly used for passenger business, and the company could not transact its passenger business at Marquette without the whole area that is devoted to this service, while it could transact its other business elsewhere. It is a two-story building, and, while it may be proper to assign some portion of its value to the common use, I hardly know how to go at it to make such assignment. I have not the data to show the pertinent facts. Nor have I for the buildings along the line generally used for all purposes of the company.

Page 130 of Complt.'s Ex. 1*a*, Riggs, schedule 35, **Engineering on** Equipment; 2% of cost of reproduction allowed, as in 1911, and allocated with equipment assigned to different classes of the service. **Hansel allowed same rate, and carried it without depreciation, as I did. Hansel allowance, $61,042; Riggs 1913, $71,773; Riggs 1911, $58,924.**

Pages 133-136 of Complt.'s Ex. 1*a*, Riggs, schedule 37, Contingen-

cies; allowed, cost of reproduction, $1,132,048, and present physical value, $933,917. The contingency is computed as a percentage for each schedule, and the present value is computed by the same percentage on the depreciated item. No contingencies on land are included in Complt.'s Ex. 1*a*. On page 2, contingencies on land still appear in the 1911 column, but not in the 1913 column. Hansel allowed $479,735, for both cost of reproduction and present physical value.

Complt.'s Ex. 1*a*, Riggs, schedule 38, Legal Expenses. This is .5% of all items except land (1 to 37 inclusive), and is not depreciated. Allowance, 1913 (without land), $77,637; 1911 (with land), $85,122. No contingency allowed by me on this item.
173 Hansel allowed $70,000, with 10% contingency. This is allocated the same as the property upon which it was computed.

Complt.'s Ex. 1*a*, Riggs, schedule 39, Organization, Administration and General Expenses. 2% on items 1 to 37 inclusive. Allowed, 1913 (excluding land), $310,551; 1911 (including land), $340,490; Hansel allowance, $100,000, plus 10% contingency.

Complt.'s Ex. 1*a*, Riggs, schedule 40, Interest during Construction. 7½% of items 1 to 39 inclusive; it is not computed on land in 1913. The 1913 amount is $1,193,679, without depreciation. Items 38, 39 and 40 are allocated to the different classes of business by application of the percentages to the base figures which were allocated.

Complt.'s Ex. 1*a*, Riggs, schedule 42, Stores and Supplies. Value, 1913, $308,502, based upon inventory. The assignment is made to each item on the inventory to freight, passenger or common. There is no attempt to allocate to ore. The Michigan proportion is 81.87% of the total, based upon main line mileage.

Complt.'s Ex. 1*a*, Riggs, schedule 43, Working Capital. In 1913, $154,000; Hansel, 1912, $100,000; Riggs, 1911, $198,000. The figure for working capital in 1911 (also 1913) was given me by Mr. Delf, and derived by him from the books. I understand it is the average monthly cash on hand, plus cash in transit from the agents and accounts collectable, being the average of twelve months.

From page 1 of Complt.'s Ex. 1*a*, in my opinion, the fair and reasonable present reproduction value of the South Shore property in Michigan, excluding land, was $17,584,369, and the fair present physical value, $14,602,343. I believe Complt.'s. Ex. 1*a* is fair,
174 reasonable and conservative, in respect to every item. I have endeavored, in making it, to correct error where I have found it, up or down, as the case might be, and to make a more correct, up-to-date inventory of the various individual parcels than has been done before.

In the present physical value column, I have endeavored to put the cost of reproduction for each separate item affected by the depreciation of that item. It represents the present conditions of the various elements of property, as compared with new units. As a whole, it is not to be understood as meaning any impairment in the use value of the property.

Perhaps, in some instances of property, it might, but, as a whole,

the usefulness of the property, and its capacity to perform service, is just as good at 85% condition as it would be if all the elements were new. The property is more useful as an instrument to carry on the business of the company than if new, because the various parts are co-ordinated, working together, have been tested out, and it is a seasoned operating property, and, therefore, better than a new, untried, unbroken property. The property included in schedule 3, Grading, is in better condition as an old property than it would be if new.

I have endeavored to allocate to freight, passenger or ore, all property that could be so allocated by reason of its exclusive use in that particular branch of service. Property commonly used by freight and passenger was figured as property common between the two. That would be so as to an item of property that was used relatively a small amount in one department or in the other; it was simply included as common between the two. No attempt was made by this exhibit to make any apportionment of the common property to either class. The items allocated to freight are all in use in freight service; the same is true as to passenger and ore.

175 Under engineering on roadway and structures, I have included 4% of all roadway and structures schedules. In that, I intended to cover engineering in reconnaissance and preliminary and location survey—the construction survey—that is, the engineering work necessary to take out, measure and inspect the roadbed, embankments, cuts, fills, etc.; also the engineering, inspection, plans, etc., of bridges, trestles, buildings of all classes, docks and wharves, and other permanent structures along the line in Michigan. I believe 4% is conservative, if not too low, to cover the actual expense, if the real estate is not included, on account of the large amount of work necessary in creating the railroad. I have in practice and study become familiar with the history of the extent of preliminary engineering work before the actual laying out of the work and going on to construction.

The reproduction estimate assumes the territory to be as it now is, and engineering work on such a property as D. S. S. & A. today is probably more favorable to low cost of engineering than in the early days when the road was built. I think if it were possible to determine original cost of engineering on D. S. S. & A., as it exists today, that would be more than I had estimated.

As I conceive the problem of original cost, it is to secure the original cost of all structures originally or subsequently built on the line, deducting all that have been abandoned or ceased to exist. I have never undertaken to estimate original cost, and do not have in mind the most correct method of arriving at it.

I think original cost of engineering on D. S. S. & A. would be greater by reason of the more difficult condition existing in the early days, adding to the expense of reconnaissance, preliminary and location survey and construction survey, and also due to the fact that the road was built piecemeal, and was spread over a great

176 deal more time, and that many of the pieces of property as they exist now were put in as small items of property on

which the engineering percentage would be unduly high—much higher than if it were possible to reproduce the property as a whole.

Notwithstanding the line is already fixed, assuming its elimination, it would be necessary to re-locate it, and to incur anew all of the expenses as if we were building another, new railroad in the territory, with the same mileage. My belief is that the final intention in 1900 was to include all engineering charges proper and necessary as part of the cost of construction of a railroad. I only know in a general way what part of the 4% engineering charge would belong to engineering for reconnaissance.

On a line I had charge of in Indiana, the reconnaissance and preliminary and location surveys, in rather open country, cost around $100 a mile, while the total cost was $850 a mile. The preliminary surveys would be much greater in a heavily timbered country than in open country.

Complt.'s Ex. 1*b*, Riggs, is an inventory describing right of way and station grounds of D. S. S. & A. in Michigan as of June 30, 1913, and allocating portions thereof to the different services. The right of way and station grounds are in order by counties, following as nearly as practicable the list in Ex. 1. The acreages of right of way have been carefully compared and checked by Mr. Cadarette and myself. Maps of certain cities (named) have been prepared to correspond with the allocation. The description numbers of Complt.'s Ex. 1*a*, Riggs, identify the descriptions on the maps.

Complt.'s Ex. 3*a*, Riggs, includes descriptions 1 to 14 inclusive, Chippewa County, of Complt.'s Ex. 1*b*, Riggs.

177 Allocations on Complt.'s Exhibits 1*b*, Riggs, and 4*a*, Riggs, are, in my opinion, correct.

I have studied conditions at Houghton, walked over the territory, Houghton to Pilgrim River, crossed by South Shore, about 2.5 miles from end of Houghton yard, secured all topographical maps made by the Government in that territory, secured copies of those locally made, and made notes on the condition. Between Chassell and Pilgrim River, there would be no serious difficulty in constructing a railroad between the foot of the hills and the South Shore, and such railroad would not be of appreciably greater expense than South Shore.

From Pilgrim River to Houghton, South Shore right of way occupies a very narrow shelf of land at the foot of the bluffs; the railroad level varies from 15 to 30 feet above water, and on the bench they occupy the original profile shows a very light grading—fills and cuts of two or three feet, with the exception of one or two streams crossed. The average grading per mile was about 7,000 yards. The right of way varies in width, averaging, perhaps, 75 or 80 feet—some 66, and some 100. The foot of the bluff is very close to the right of way fence—within a few feet, all the way; in a few places, the slope is so steep that the right of way fence is 15 or 20 feet above the track. From Isle Royal stamp mill, near Pilgrim River, to end of terminal yard, the bluff is abrupt, and rises to a height of 96 or 97 feet above the lake at the school of mines.

From the center of South Shore track opposite the school of

mines building, where the track is, perhaps, 20 feet above the water, over to a point where the bluff is 100 feet high, the distance does not exceed 150 to 200 feet.

178 Back of the summit, spoken of as being 100 feet high, is a second bench, which varies in height from 40 to 100 feet above the lake, being 200 or 300 feet wide; the hills back of that rise rapidly to the height of over 400 feet, and this range of hills extends for a number of miles. It would be absolutely impossible for a railroad, approaching from the south, to secure an entrance into Houghton that is favorable as to grade and amount of work as that of the D. S. S. & A. To go back of the city and come in on the line of the Copper Range would involve crossing a range of hills over 400 feet high and the construction of many miles of additional line, to secure a feasible grade.

Mr. Wykes: I wish to make an objection to the narrative as given, and to any statement of cost of locating a line on any other route, or of any other road purchasing a line through this route to parallel the South Shore, as being immaterial.

All the terminal land of the plaintiff occupied by tracks shown on Complt.'s Ex. 16*a*, Riggs, is on a level, approximately 20 feet above the water. There is no other piece of land east or south of the bridge across Portage Lake large enough or available or suitable for yards, except that occupied by plaintiff. I have made an approximate estimate of the cost of constructing a line from Pilgrim River into Houghton, 2.5 miles, and a further distance of 1.5 miles, to a point near Copper Range, which is the nearest suitable physical location for a yard, disregarding all questions of present occupation, ownership, values or cost of land, the line assumed being partly on land owned by plaintiff, as being the most favorable line.

It is my opinion that, ignoring all those things, without allowance for land, simply the difference in construction cost, it would

179 be impossible to build such a line and provide equal yard facilities for less than $250,000 in excess of the cost of creating the South Shore property, or a similar property. It is my further opinion that such a line, because running through the business center of Houghton and cutting into high class residence property and that owned by the State, would be absolutely impossible to build. If it were necessary to actually build such a property and acquire the land for it, the cost would run into millions.

The excess cost for the 2.5 miles and the 1.5 miles additional line for the yard would be $250,000. The only point topographically suitable for a yard is about a mile west of the bridge, near the Copper Range yards. The excess cost is due to cost of grading, extra construction, and extra length of track, and it is based on the assumption that there would be no land to pay for. The excess arises from the fact that line must be higher than South Shore, that the earthwork would run 75,000 or 80,000 yards per mile, while South Shore runs approximately 8,000 yards, the culverts would be longer, heavier and more expensive, and there would be more rock and loose rock. I disregarded all questions of land value or cost of acquisition

of right of way, and simply make comparison of physical construction.

I have made the same study with reference to the approach to Marquette from the east. There, referring to Ex. 6*a*, from a point near the Standard Oil Co. dock to Chocolay River, about two miles, the road occupies a flat bench varying from 125 up to 260 feet; at one point, where the Carp River comes in, the valley widens out so there is a gap or distance between the hills of a quarter of a mile On this narrow bench, an average of 20 feet above the water, and almost level, the D. S. S. & A. occupies the land nearest and clo e to the water's edge; the M. M. & S. E., for the entire distance, lies alongside the D. S. S. & A. and within a few feet of it, except
180 at the Carp furnace, where D. S. S. & A. is on the lake side and the other road is on the land side of the furnace, for a quarter of a mile, the roads being at least 100 feet apart.

From Marquette yard to Carp River, about a mile, there is on the hill side of the road a tier of rocks, which are quite shallow, 60 to 80 feet in depth. On these, are 14 or 15 houses, and some other structures, so the entire plat from Marquette to Chocolay River is occupied. From Carp River to Chocolay, where the hills are close, are two points where the hill comes up to the road with quite high bluffs of solid rock, and, except for these two points of rock and one or two dwellings, there is practically no occupation of the ground between the highway and the hills. The hills are very irregular along the lake front. There is no second bench; it would be absolutely impossible to locate either a hillside line or a line on any second bench, and either the flat must be occupied or a hill line located to come into Marquette at a point a couple of miles away from the present lower yard, at a much higher elevation.

I have looked at this thing in three ways: First, assuming it possible to use the highway, without providing any other location for a highway, there would be practically no added expense over the construction of the South Shore; second, if it were necessary to move and furnish a new highway, eliminating all questions of land value, it would be necessary to make two quite heavy rock cuts, one at each point of rock, and the expense would be $25,000; third, the cost of construction of a line in the hills would be over $300,000 in excess of the line on the flats, and would contemplate providing a yard remote from the water front, and back of the city; the cost of this yard is included in the amount given. I am speaking simply of construction costs, not taking into account land values, cost of
181 right of way, or buildings; it is almost impossible to fix the excess cost of securing a suitable yard, meaning cost of construction. The lower yards are on available land, and have not involved expensive construction.

The first two plans bring me to the lower yard; from that point to another suitable location for a yard would involve about 1.5 miles of additional land, and some heavy rock cutting, requiring an excess cost for construction over existing cost of $40,000 to $50,000, and ignoring land values. That would give a yard on a branch, without access to navigable water, and add tremendously to the cost of opera-

tion of the yard; I have no means of computing the added cost of operation; it would be substantial. By navigable water, I mean navigable harbor.

RIGGS.

Recross-examination.

By Mr. Wykes:

In estimating the excess cost of $250,000 out of Houghton, I prepared countour maps which enabled me to plat several profiles, and the facts given were based on the study of these, determining the feasibility of different lines and the approximate yardage of earth that would necessarily be moved in their construction. I made no measurement on the ground, further than to, every few hundred feet, make notes as to the condition of the hill, the distance of the foot of the slope from the center of the tract, and the approximate rate of slope of the hillside, to enable me to say from my knowledge that the maps were correct.

I ran no line, and made no surveys or locations, either at Houghton or at Marquette. I made a careful reconnaissance of the ground, and based my estimates from notes taken by me, and from
182 Government and other maps which I had with me of the ground, so that, to my own satisfaction, I verified the conditions disclosed by the contour of lands upon the maps. From my study of the topographical maps, and from going over the line of plaintiff and inspecting the cliff, and its height and location, I have formed a judgment that the excess cost of construction would be as I have stated. In my judgment, the cheapest possible line into Houghton would have to be located on the hill side of the D. S. S. & A., as near as possible to the existing line. In making my assumption, I have located it as nearly as possible to the South Shore without interfering with any existing structures or railroad use of the land now occupied by South Shore.

That location would force the line to a level, 30 to 40 feet higher than the present South Shore tracks. My estimate is based on the difference of cost of physical construction between South Shore road and another line as nearly as possible to that location, but so located as not to interfere with any railroad use of the South Shore land.

I made quite an elaborate study of both situations; I spent a couple of days *of* the ground at Marquette, and a day on the ground at Houghton, and two or three days in the office, besides having cross-sections made by assistants, and made quite numerous figures upon which I base my answer. Those figures are not what I have given, but I have used them to predicate my judgment upon; I have not all those figures with me, but have certain maps, profiles and cross-sections with me.

I have made numerous estimates, but have not made up any complete estimate showing the details for the figures given for Marquette or Houghton, but I have in mind quite clearly the approximate earth quantities and the differences in elevation, and upon

those I predicated my answer and judgment. I can give
183 some of those figures. I have simply the result of a whole lot of study, and I don't know that I have them all with me. They are based upon the most available and cheapest line that it would be possible to get in, without interference with the existing property of the South Shore.

That line I located as approximately 75 to 100 feet away from the South Shore line, and substantially parallel to it except at the yard. From Pilgrim River to the terminal property, the yardage figures from the lowest line I located was 118,684 yards of pay earth, as against 21,056 yards on the existing line. There is no surface condition upon which to predicate a classification of the material; I did not attempt any.

That line is about half the total length of the line from Pilgrim River to the point where the new yard would have to be located, and takes us to the easterly end of the terminal. I figured that to get a suitable height for a yard it would be necessary to go 1.5 miles beyond that. I estimated, roughly, that it would require 300,000 additional yards of grading to get a satisfactory suitable line to a proper place for a terminal yard, part being due to the extension of the line 1.5 miles beyond the present terminal; that part being close to a half.

I haven't that line delineated on any map so it could be used as an exhibit; I could prepare it without much difficulty. To check it, it would be necessary for any one else to go on to the ground and make his own study, as I have done. He must, to estimate the same thing as I have, know where I placed my line; as he went up the hillside, his quantities would become greater. When I say the land would be
parallel with the South Shore, I mean generally, not exactly.
184 I included, also, the excess cost for waterways and minor drainage. The question of classification at Houghton is difficult, as the slopes are in a condition of nature, covered with timber and brush. I assume that there would be a considerable percentage of classified material—that probably one-third would be classified material, at an average price of twice the earth work. The fact is, there is a possibility of finding rock, undisclosed today. I assume there the lightest line would have 487,000 yards of total pay earth, 40,000 to 50,000 solid rock, and a considerable amount of loose rock.

The line at Marquette was one which followed the contours among the hills, to the nearest point where there was suitable ground for a yard at Marquette. This yard would be, perhaps, 1.5 miles from the present yard. I also assumed the line among the hills terminating at the present southeast yard. That involved less quantities, about 300,000 yards, the estimate for that being slightly over $260,000.

For a distance of a half mile from Chocolay River toward Marquette, the ground is flat, considerable swampy, and from 15 to 20 feet above the lake level. There is also considerable flat land at the Carp River, to use which would require a considerable fill.

The southeast yard of plaintiff was the yard of the Marquette &

Western. The D. M. & M. came into the same point, while the west yard was that of the M. H. & O. The combination of the three roads into the D. S. S. & A. resulted in the two yards. The main receiving yard for ore is the west yard, while the other yard is in use as the principal freight yard and for empty ore cars.

(Witness testifies to changes in mileage of branch line, June 30, 1911, to June 30, 1913, resulting in increase of 15.41 miles.)

185 All of the branches stated are freight branches, and a considerable amount of branch line has disappeared and been replaced by other branches in the two-year period; that change goes on more or less every year in operation. Every railroad has a constantly changing mileage of such secondary tracks as these. There are no passenger branches, except the Republic branch, treated as main line, which is joint freight and passenger, and remains unchanged.

I think the practice of plaintiff is to treat each sidetrack as an independent item, making a charge to additions for all lines constructed, crediting additions and betterments and charging operating expenses for all items taken out. The I. C. C. prescribes the general method of treating this account. Plaintiff keeps accounts of each separate sidetrack.

I am not clear that my answer, that it was charged to operating expenses, was correct. I think the practice is to credit additional and betterments with the line taken up and charge operating expenses with the actual cost, if known, or the estimated replacement cost, as of the date of the change.

In filling structures whose height exceeds 20 or 24 feet, it would cost more to make the fill than the value of the structure in the 1911 appraisal. If it was a low structure, eight or ten feet high, the cost of replacement would exceed the cost of filling. The fill makes a better structure; the trestle is still in, but the fill alone is appraised. The structure makes it possible to fill at less cost than if there were no trestle in existence.

I made no investigation of the actual cost of moving the yardage to fill these trestles and bridges. Plaintiff has been doing a very large amount of work with steam shovels and trains, not only

186 filling these trestles, but widening the shoulders of fills, in connection with the re-ballasting operation; this work has gone over a period of several months, and a great deal more money, in the aggregate, has gone in than has been included in the appraisal. Much of it is in the nature of replenishment of banks, and I have made no attempt to add anything of that sort. I have made no attempt, whatever, to analyze the costs of plaintiff's work.

The strengthening of bridges and trestles by adding new stringers was to permit the safe use of larger locomotives. The typical construction was two stringers under a rail; a third has been added, adding substantially 50% more carrying capacity on all the wooden structures. This was done to all main line bridges and trestles, except a few.

Mr. Cadarette reported the additional timber. After inspecting every bridge, the quantity was estimated, and the unit prices applied.

There was no attempt to ascertain actual cost, though that was considerably in excess of the cost of placing the stringers if the bridge were built new. The cost of additional stringers should have been carried as additions and betterments; there might be a fairly intelligent estimate of the actual cost made, but I made no attempt to do so.

Bridge 186, page 50 of Complt.'s Ex. 1, Riggs, was built over, new, since 1911. That was in, in 1911, at, cost of reproduction, $2,167, and present physical value, $1,182, or about 50% of condition.

Bridge 179, page 50 of Ex. 1, had timber abutments and trestle. It was given concrete abutments, and 109 feet filled, and was carried it 1911 at, C. O. R., $3,524, and P. P. V., $2,706.

187 Bridge 94D has been replaced by a new bridge, and is in, in 1913, at $18,830. I do not know whether that is actual cost. The previous structure was, in 1911, C. O. R., $7,514, and P. P. V., $3,809—50%, except iron.

Trestle 240, page 76 of Ex. 1*a*, was entirely rebuilt in 1911; C. O. R., $323, and P. P. V., $166; timber 50%; iron 70%.

Bridge 20D, page 57 of Ex. 1, given concrete abutments since 1911, was carried in 1911 at, C. O. R., $1,220, and P. P. V., $1,040; it is now carried at a lower cost of reproduction, and is a better structure; as the price is less than the old one, there would be no charge to additions and betterments.

Trestle 295, page 84 of Ex. 1. C. O. R., $1,428; P. P. V. $749; given new plate girder and 79 feet filled.

Bridge 314. The steel was strengthened, at a cost of $7,005, to take care of heavier equipment; it was a rather light structure.

Bridge 317, page 62 of Ex. 1, entirely rebuilt, and 177 feet filled; in 1911, C. O. R. $10,430, and P. P. V., $5,789; timber, 50%, and iron, 74%, in 1913; cost $18,500, which I think does not include filling.

Bridge 319, page 63 of Ex. 1, entirely reconstructed, and 353 feet filled; in 1911, C. O. R. $11,593, and P. P. V., $6,465; timber, 50%; piling on abutments, 64%; trestle approach, 54%; iron, 77%.

Bay Mills trestle, page 74 of Ex. 1; 1911, C. O. R., $73,410, and P. P. V., $38,501; timber, 50%; iron, 62%; omitted from 1913 appraisal. The use has been discontinued. The traffic doesn't warrant maintaining the line at Bay Mills, and extensive repairs would be necessary to put the trestle in condition—more than is justified by the traffic.

188 There were 73 new closed culverts in 1913 appraisal, all on pages 29-34 of Complt.'s Ex. 1*a*, Riggs—given the same numbers as in 1911. These structures are all new construction since 1911. Two culverts built prior to June 30, 1911, were omitted in 1911; they are, page 32 of Ex. 1*a*, C. O. R., $1,349, and P. P. V., $1,285, and page 33 of Ex. 1*a*, C. O. R., $4,629, and P. P. V., $4,346. Of the 73 new closed culverts, some are clearly replacements of old timber culverts, in in 1911 appraisal and taken out. Possibly a few are new where there was no previous structure.

Tie prices were increased from 34 plus cents to 40 cents; the hauling price is included as 5.5 cents, made up of the same items as in 1911, and intended to cover handling from point of delivery on line along-

side road to material yard and to point of use. The material yard is the point of distribution.

I allowed one cent for inspection, and for loading, unloading and handling—loading the tie from the track on to the train to carry it to point of distribution, and unloading at that point—2¢, and transportation 2.5¢. The transportation out from the point of distribution would be in track laying and surfacing—not in this item.

In getting the 1913 price of 40¢, I took a simple average, and did not weight the averages as between the classes of ties—cedar, tamarack and hemlock. The average thus obtained was used as the basis of my judgment. In my judgment, the 40¢ price is conservative, and very much less than should be used on the assumption of reproduction, as it is practically within a fraction of a cent of what the company has been actually paying, assuming the 5.5¢ for handling, etc., correct. Reproduction would involve a much larger market, with more difficulty to secure ties, and, unquestionably,
189 the price would go up materially, so that, on a strictly correct reproduction basis, the price ought to be nearer 50¢. This is due to the fact that the demand for ties produced by a large amount of construction would increase the price.

The 40¢ used is 3.06¢ higher than the actual cost of tamarack ties for a five-year period, allowing arbitrary of 5.5¢ per tie for handling. A small percentage of the ties purchased in last five years were tamarack; I don't think more tamarack than cedar were purchased. I haven't the figures here indicating tie purchases, and possibly I spoke a little too positively; but there have been large purchases of cedar, very much larger of hemlock and, in some years, the cedar purchases exceeded the tamarack. When I say purchases, I am referring to ties laid.

The 40¢ is .73¢ higher than average cost of hemlock ties laid for five years, after allowing 5.5¢ arbitrary and 4.23¢ under average for cedar ties. Tamarack is 36.54¢, hemlock 39.27¢ and cedar 44.23¢. The additional ties in 1913 is due to 15.41 miles of branch line.

If actual prices of ties bought by plaintiff in small lots during last six years were computed, the average prices by reason of the large number of hemlock and tamarack ties would, if applied to all the ties on the road, produce a figure lower than the 40¢ price used. I have made no computation to find the amount of that. I do not believe such computation would be a correct method of arriving at the value of the ties on the assumption of reproduction; if that were to be done, the same thing should be done for bridge and other ties, where I haven't used the excessively high price. My 40¢ price is affected, to the extent of .75¢ to 1¢ a tie, by the increased price due to reconstruction.

190 There has been very extensive re-ballasting west of Marquette, the work consisting of widening many of the embankments, filling out some sags, and re-ballasting. This territory had been previously ballasted, and, except as there may have been a few miles of sand ballast track lifted, it was in the nature of re-ballasting, and no change was made by me, as substantially all the mileage had been included as ballasted, and because ballasting was not de-

preciated. I did not consider that I was justified in making any addition to the appraisal by reason of this work of re-ballasting, which, in effect, in some places, goes almost to the extent of a change of grade. Minor sags have been lifted out, up to a height of two or three feet. The only additional ballast quantities are due to the added 15.41 miles of branches and .75 miles of side-tracks.

In Michigan, over 50 miles, from Lake Gogebic east, was ballasted in the years 1912-1913; there was also some work being done near Thomaston, and east. The 50 miles done the previous year (1912) was from near the state line, or from Thomaston, east. It was necessary to do that, as the main line from Nestoria to Duluth in 1911 was much more nearly like a branch than the Houghton branch; that is, the high class maintenance had been on the line from Marquette to Nestoria and Nestoria to Houghton, and, while the line from Nestoria to Duluth was in safe operating condition, it had reached the point where it needed considerable tie renewals and considerable track surfacing, and some rail changes, and it was not what would be called a high class main line track, suitable for the running of sleeper service.

It was not in quite as good condition as the line east of Marquette, in the maintenance of joints; there was more hammering noticeable. Then, too, there were a number of stretches of track that had minor sags which have been taken out, and the property has gen-
191 erally been having a thorough re-surfacing and bringing up of condition, to permit the running of faster passenger trains, and improve the passenger service, I judge, and to permit the hauling of heavier freight trains. I think it was, to a considerable extent, to permit the advantageous use of the new locomotives, and to a considerable extent there has been an increase of tie renewal that might be traced to the use of the heavier locomotive. The renewal of the stringers on the bridges was due to those locomotives, wholly. The new ballasting west of Marquette would vary all the way from a two or three inch lift up to as much as three feet, with, perhaps, an average of seven or eight inches; I may be a little high on my average. This is all gravel ballast.

The Marquette passenger station is located wholly to passenger business. The second story is used for offices of Superintendent, despatchers, Car Accountant, roadmasters and map room, and is in common service as between passenger and freight. The lower floor is exclusively used in passenger service. The greater part of the expense of the building has gone to the passenger service. Any building as modern in character, and giving the same amount of space to passenger service, and no space to offices, would cost a greater part of the money that has gone into this structure. In this case, the general service is incidental, and the primary reason for the building is the passenger service.

I don't think that rule should be applied to allocations throughout this case. The application of the same rule, as just stated, to the Dead River railroad, would assign a small portion of the Dead River railroad to common; this would assign a small portion of a depot to common. It seems to me it would work back with equal fairness to

the Dead River railroad proposition—that, in a way, they are somewhat similar. There is no question that there should be some
192 allocation of the passenger station to common; I don't know how to make it. The officers and people using the upper part of the station have to cross the land upon which the building is located, coming in, on the same class with the passenger, from Third or Front Sts.

The dispatching done from this upstairs of the Marquette station may extend over the whole road, to Duluth. Certain of the general officers located there have supervisory duties over the whole road. The dispatching done there is for all classes of service, including ore, as is the Superintendent's and roadmaster's work.

Certain general officers are at Duluth. Ordinarily, throughout the appraisal, where there is a passenger station and separate freight building, I have allocated the passenger station exclusively to passenger service and freight building exclusively to freight, notwithstanding there are telegraph offices and agents' offices at both. There is a telegraph office used incidentally for Western Union business, and also for dispatching, in many of the buildings allocated to passenger. I wouldn't expect it to be the general rule that the telegraph offices are in the passenger stations; on most roads, it is the other way. There are telegraph offices in the freight stations at St. Ignace and Ishpeming, and I think in no others. In the smaller stations, that have telegraph offices or instruments, the work is done from the passenger station.

The general rule is, in railroad practice, to employ one man as agent, who solicits and cares for freight business and sells tickets and does telegraphing. He may have one or two assistants, and will use the one office that is provided, generally in the station building, combination or passenger depot, as the case may be. Only in the larger towns would there be a passenger and freight man, and I
193 wouldn't expect to find a man employed for exclusive freight in any of the small towns on South Shore. In general, where a station is subject to use by telegraphing and dispatching, and the only agent has his office and headquarters in the passenger station, I have made no separation so as to attribute any part of it to the freight business.

In schedule 19, I have made no changes in price, except in one instance, due to erroneous description, in 1911. The new enginehouse at Soo, $22,046, replaced the old enginehouse, carried in 1911 at, C. O. R., $28,800, and P. P. V., $23,040; the number of stalls was reduced from 16 to 12, and half the cost was assigned to South Shore in the new structure, but all of the old, which was erroneous. At the Soo, there were a roundhouse and a cinder pit eliminated, and there was a new roundhouse, cinder pit and other new structures. All of the new buildings at the Soo were included at cost.

The 1913 appraisal shows a new enginehouse at Thomaston, $16,370, not completed June 30, 1913, included at cost, and having 11 stalls. The amount stated is the cost to June 30, and the total cost will be around $30,000. The old enginehouse at Thomaston contains 15 stalls, was appraised in 1911 at, C. O. R., $24,000, and

P. P. V., $18,000, and has been torn down. The old house was in need of a new roof and doors, and the depreciation accrued on it. $6,000 was sufficient to put it in shape to run for many years, but that and the house at the Soo were both scrapped, because too small for the new locomotives; the depreciation by obsolescence was complete between 1911 and 1913.

It is 16 miles from Thomaston to west state line; there is an enginehouse with four stalls at Superior, but no others in Wisconsin. There is 107.15 miles of main line in Wisconsin, and the enginehouse is located at the extreme end of the line there.

194 I made no allocation to Wisconsin of any property located in Michigan, and attributed no part of the Thomaston roundhouse or Marquette shops to Wisconsin. The shops are common to the whole road. Thomaston is 86 or 87 miles from Nestoria; Thomaston is a division point, service running there to Duluth and east to Marquette; a part of the service runs straight through. The Thomaston roundhouse would be used in handling locomotives running from Thomaston to Duluth. The shops at Marquette are the only general shops on the line; there is a small equipment of tools—a few hundred dollars' worth—at Superior, for making repars to equipment to carry it back to Marquette, but all rebuilding and major repairs, as to cars, locomotives and miscellaneous equipment, are made at Marquette. There is repairing equipment at Houghton, the Soo, and at various points along the line.

No part of the Marquette shops, or ground on which they stand, or tools or equipment in them, has been assigned outside of Michigan; a division between states on some basis of use might be arrived at. The work of these shops is mainly on rolling stock, but they do all of the cutting and trimming of rails used as relayer. I am inclined to think a track mileage basis would assign an overly large proportion to Wisconsin. The assignment should be on the basis of use. I think the records of the shop operation would disclose some equitable basis.

The new coaling station at the Soo, costing $6,650, superseded one carried in the 1911 appraisal at, C. O. R., $6,082, and P. P. V., $4,234—timber, 65%; embankment, 100%.

I allocated the right of way to ore dock No. 4 to exclusive freight. It is now being used for the delivery of freight to the Roach & Seber warehouse. It will be possible to develop a business on that
195 track, and it is not necessarily limited to one warehouse. I do not think that the business of that one warehouse would justify plaintiff in buying the land at the figure named by me in 1911 and building the track to it, but I believe that business may be developed which will justify the continued ownership and maintenance of that track.

I don't think, considering the warehouse and the stores abutting on this track, that the track would ever have been put there without the ore service, on account of its involving an expensive subway. The point of connection of No. 4 ore dock track runs half way into the block between Fourth and Fifth Sts., allocated entirely to common.

There is, perhaps, 40 or 50 feet of track outside the clearance in that block, allocable to freight.

I made no attempt to make detailed comparison of original costs—the records were not available. I have tried it several times, for small portions of line on other roads, and some years ago came to the conclusion that such method of appraising is impossible.

We know certain things that would make the original cost higher than the present cost, and other things to make it lower; to know whether it would cost more or less now than 30 years ago, and to give definite final answer, you must have all of the elements of unit prices as of the time of construction, and practicaliy make an estimate as of that time. Until you have that, any figure of estimated original cost is in the nature of a guess. The largest item in the last analysis is labor; the ties, rails, timber, etc., have labor in them; in its last analysis, if all the structural materials in the South Shore were taken in a state of nature and reduced to the condition in which we find them in South Shore, over 90% is labor. I investigated no prices on South Shore, from its books or otherwise, of any of its construction 15 years ago.

196 I did not intend to make as sweeping a statement as you seem to have construed it, to cover the general cost of the road; I said that I felt that, owing to the piece-meal construction, and owing to the condition of the country, having been covered with timber at the time of original construction, and thereby adding greatly to the cost of earlier surveys, and especially the piece-meal construction and the large structures, I was quite certain that, if original cost of engineering could be shown, it would be in excess of my estimate; but I did not intend to go so far as to say that original cost for the help would necessarily be in excess of reproduction, although it might be—there is a possibility.

My 4% for engineering was intended to cover everything, including preliminary. I think it conservative—low enough, and fair. On 30 miles in Indiana, the cost was 4.25%, and I have known the percentage to go as low as 2.75%. The average, I should say, at present, is considerably in excess of 4%; that is fair for such a property as South Shore, and would be high for a railroad in the west, where the country is open and construction light, and low for work like Lackawanna is doing in New Jersey.

In construction of South Shore at present, the cost would be likely to go above 4%; engineering has increased in the last 12 to 20 years, due to more complete engineering; employees are higher, and there has been marked increase in the employment of high class consulting engineers.

Description 13, Marquette County, Complt.'s Ex. 1*b*, Riggs, and Complt.'s Ex. 6*a*, Riggs. There is a little more than half the land owned by the railway company west of the westerly track that is not in use for railway purposes, and that is in a state of nature. On the north line of Ely lot, it extends 300 feet and on the south line

197 250 feet from the most westerly track to the back end of the lot; one-third of that is in use, carrying embankment, and the

balance would have to be acquired in acquiring the front, and is necessary for any extension of the yards that may be made.

Description 14, Marquette County, 850 lineal feet of water front outside the breakwater. When breakwater is completed, this will be well inside it. The greatest width of this water front from the most easterly track in the hard land is, at the point of rock, 250 feet. There are no structures of any kind on this water front. It would require the removal of considerable solid rock to put any railroad structures on the northern end of it.

Description 15, Marquette County. (Quotation from affidavit of witness of April 12, 1912, in which it is stated: "He included in his inventory another tract which lies on the lake front * * * valued on the basis of its foot frontage." Some of this tract is used for railroad purposes, but the exact acreage deponent cannot now tell.) I had in mind, in making the affidavit, the riparian rights of the water front opposite Burt and Fly's Add., where there is no use of riparian rights, and the non-use of a small amount of land between the site of ore dock No. 1 and the Ely lot; that would fall on descriptions 22 and 14.

Description 33, Marquette County—also 32. These descriptions are, in part, used as piling ground for material. That material would be included in stores and supplies, which were located between Wisconsin and Michigan on track mile basis.

There is a constant change going on, on every railroad, in the length and location of side tracks; some are more or less temporary, and in some industries there is more or less steady shifting of
198 track. There is a frequent change of sidings which serve the mines, so that every year there are three or four miles of side track taken up and a corresponding amount laid in some new location.

In cases of the establishment or abandonment of an industry, there may be a large increase or decrease, but the normal changes on an estimate won't vary much from three to five miles a year. Passing track and yard tracks are more permanent, the changes being likely to be additional tracks.

RIGGS.

Redirect examination.

By Mr. Eldredge:

As to the line from Pilgrim River to Houghton, I have assumed that the land acquired by plaintiff in acquiring its right of way, and between the highway and the railroad, might be available outside the limits of the actual roadbed of the South Shore, and I have assumed the use of such portion of the terminal as might be used without interfering with existing tracks or buildings thereon. I will lay out the proposed line on a map, and furnish it to defendants.

I took into account possibilities of a line from L'Anse to Houghton. In my judgment, it is impossible to get any line crossing the

range of hills that runs back from Houghton for a number of miles, without heavy work, excessive length of line, and greatly increased expense. It is impossible to get a line in the hills near Houghton without much heavier expense than involved in paralleling South Shore. There is no difficulty in locating a line to Chassell, and from there to Pilgrim River, which would be substantially equivalent of South Shore in cost. The line I have estimated was upon the cheapest line, Pilgrim River into Houghton, and provided a suitable yard at Houghton. I considered lines commencing east of
199 Pilgrim River, but did not lay them out on paper, or prepare profiles or estimates, because a line in any other general location than that of South Shore would involve longer distances, heavier territory, and greater cost. This I was able to determine from general knowledge of the country, without reference to profile maps.

In Wisconsin (at Superior) are six roundhouse stalls. Six or seven stalls at the Thomaston house will, with the Superior house, house every locomotive engaged in interstate business. There being 13 allocated to the interstate traffic between Michigan and Wisconsin, and taking into account the engines in service on the road, six stalls at Thomaston and six at Superior would be more than ample to care for the present interstate business. I think no engines are engaged exclusively in Wisconsin business.

I have often made estimates upon the basis of time required to do the work, the number of men employed, and probable cost. In fixing a price I was making for engineering work to be done, I have several times been called upon for such a figure. I have so estimated the cost of engineering work of which I was to have charge. My adoption of 4% for engineering was based upon my experience in engineering work and knowledge of engineering cost. I cannot say that any computation, estimating the number of men required, etc., has led me to this particular 4%. Where I have made a computation, the percentage has varied, depending on the size and character of the work, from below 4% to as high as 10%. The difficulty in estimating in such an instance as this is the large and expensive structures; if they could be eliminated, it would be comparatively easy to estimate the engineering required to reproduce the line, grade, bridges and ordinary track construction.

200 On description at the Soo, there was allocated 1.5 acres to passenger, 8.91 acres to common, 1.65 acres to freight, and 5.39 acres questioned. A correction should be made, deducting from the common 4.9 acres, and transferring it to freight, making the common 4.01, freight 6.55, passenger 1.5, and questioned 5.39. With this change, parcel 7 is correctly allocated; the dividing line is erected at right angles to the center line of the main track. That covers all changes at the Soo in addition to those made at the hearing, except the allocation of sidetracks.

At St. Ignace, on description 7, 72 acres should be transferred from common to exclusive freight.

At St. Ignace, a portion of description 8 should be allocated to freight. I have allocated the north freight yard, that portion of

the description north of the main track, 6.72 acres, leaving the balance of 49.81 acres common.

Description 5, Complt.'s Ex. 6*a*, Riggs, Marquette. In stating no riparian rights are used here, I meant there is no track on this land, and no construction from it into the water. The hard land is essential as supporting the track immediately adjoining in Lake St., and the entire frontage has been riprapped with stone by plaintiff, which stone extends into the water. I included nothing in this appraisal, or in 1911; Mr. Hansel included $1,700 for riprapping on this mile. In stating there was no use of riparian rights, I used the expression bearing upon the fact that there is no structure into the water for commercial purposes, or connected with navigation.

201 Description 7, Complt.'s Ex. 1*b*, Riggs, Marquette County. I have extended the land allocated to exclusive freight to a point closer to the main line; I would change the allocation by giving 15 lots to common service and 32 to exclusive freight.

Description 12, Complt.'s 1*b*, Riggs, Marquette County. Corrected to transfer four lots from common to exclusive freight. I have put all the land to the west of the main track, laying off half the distance between the main track and the next track westerly, extending from Jackson to Mesnard Sts., and assigned everything west of that land to exclusive freight.

On January 19, 1914.

RIGGS.

Cross-examination resumed.

By Mr. Wykes:

In Complt.'s Ex. 1*c*, Riggs, I have followed Complt.'s Ex. 1*b*, Riggs, in allocations of land as between non-railroad use, passenger, freight, ore and common. Ex. 1*c* sets up in parallel columns the land descriptions as appearing in Complt.'s Ex. 1, Riggs, 1911, Defts.' Ex. 15, Hansel, 1912, and Complt.'s Ex. 1*b*, Riggs, 1913. On Ex. 1, the parcels were not numbered; I have now numbered them, beginning with number one, at the top of, and running consecutively through, each page.

Mr. Hansel's numbers start with item 1, and run continuously through the land description. Complt.'s Exhibits 1*b* and 1*c* begin a new series of numbers for each county, and run consecutively through the county. Ex. 1*c* permits comparison of the land included in each appraisal.

I have placed no land values since Complt.'s Ex. 1. I have prepared a statement showing each sidetrack, with length, allocation to class of service, and, where freight sidetrack is located on land allocated to common use, the acreage that should be allocated to freight by reason of the sidetrack. This involves a change
202 of classification of a large number of small items of land, aggregating, perhaps, 75 acres. In my previous exhibits, where an exclusively used sidetrack fell on main line right of way, I made no allocation of the ground on which that sidetrack was

located, but treated it as common, invariably. The exhibit I have now prepared locates such land as between passenger, freight or common.

Where an allocation of property becomes necessary, it is consistent to make an allocation of land occupied by freight sidetracks to freight, though many of these sidetracks are temporary in nature. In the great majority of sidetracks, the amount in dollars and cents is comparatively unimportant.

I made no further allocation in Marquette, as I think those already made cover all the land occupied by exclusive use tracks, where it is possible to allocate land to the freight service. In certain classes of track, no allocation can possibly be made to freight; e. g., a crossover between two main lines may be used exclusively for, and be properly assignable to, freight, as far as the track is concerned, yet the track occupies common land, and may be so located that it is impossible to stand a freight car on it without interfering with the movements of trains on the common track.

There are 15 or 20 such tracks on the line in Michigan; the same thing is true of a hundred or more feet of the length of every sidetrack, where it leaves the main line. It is impossible to allocate to freight land occupied by main line track and necessary to the passage of a train over the main line. These instances, while numerous, cover a small acreage of land, if the allocation to freight is made to run through (to) the clearance line of the main track. All sidetracks, spur and branch line lengths are measured from the point of the switch. In allocating land under sidetracks to freight
203 use, I have taken a line seven feet from the center of the main track as being the limit of actual use by the passage of a train over the main line, and have assumed a total distance from the point of the switch to the clearance line of about 150 feet.

For sidetracks which lead off the right of way and do not parallel the main line, I have assumed a width of 25 feet, and have allocated an irregular parcel, 25 feet wide, commencing opposite the point of the switch, giving a narrow strip of land there, widening out to 25 feet, 150 feet from the point of the switch and full 25 feet from thereon. The 25 feet, in my judgment, properly covers the track and embankment. For sidetracks paralleling the main line and remaining of the right of way next to the main line, I have taken a strip of land running from the seven foot clearance line out to the right of way line, commencing at the point of the switch and running through to the point of the other switch, giving not only the land occupied by the track itself, but all of the land to the right of way. This, I think, gives rather too much land to the freight, but it is done on the assumption that access to the sidetracks is necessary to unload cars, and that such access is freight service. Where tracks are used for storing cars, this would assign more to the freight than was actually used. A small triangle at each end, opposite the point of the switch, is, in reality, common.

My first allocation was on the idea that the freight track was a temporary facility, and that its presence did not interfere with the entire use of the right of way by the joint service; but, if allocation

is to be made, I do not see that it is inconsistent to allocate the land under freight sidetracks to that use temporarily. In every case, I assumed that the point of clearance would be 150 feet from the point of the switch.

204 In the allocation of sidetracks and spurs, the items of construction are the track, and any allocation made of the track would carry with it all items in the schedule that pertain to the track; this includes clearing and grubbing, grading, ties, rails, track fastenings, track laying and surfacing, ballasting, etc. The land, except switch leads and cross-overs, may or may not be allocated to the sidetrack or spur; that is a matter of opinion; I see no inconsistency in doing so, but I do not see how any allocation of land within the limits of clearance of the main track can be made to sidetracks.

On page 126 of Complt.'s Ex. 1*a*, Riggs, official cars are allocated as passenger; I think those should be considered as common. I have allocated no locomotives to ore service; some locomotives are used for a part of the year in exclusive ore service, but during season of closed navigation the major part, if not all, of that equipment is used in freight service. If any are allocable to ore, the number is small, and due to the fact that such locomotives would be out of service when not in ore use.

The allowance of 1,300 feet beyond the end of the switch at stations was to permit the working of trains on the main line, going into or coming out of the yard. A passenger train of five coaches would be 360 to 400 feet in length.

In making 1913 exhibit and inventory, a more careful survey of the road was made than previously. I cannot give you the items found in this more careful inspection, that are omitted from 1911 appraisal; that will show up on a comparison.

The instances which I have in mind of items that were omitted were two quite large culverts, which were not included in 1911—the double lines of 48 inch pipe on the Houghton branch and the concrete culverts just west of Marquette yards, both of which

205 were put in prior to 1911, and omitted (evidently, C. O. R. $4,629, and P. P. V. $4,346, on the first). There were also quite a number of minor structures, in buildings, that we found.

I do not think, now, of any items of appreciable size left out in 1911 and found in 1913, that I have not already testified regarding. I feel that, in the main, the 1911 inventory is a creditable inventory; there were a few errors of omission, and a few errors of inclusion of items not properly included, and those, I think, have mainly been corrected in 1913.

I don't think the tickler noticed at Marquette as having been omitted in 1911 was included. I think it possible, if time were spent, covering the ground, and taking several weeks, for a full inspection and a careful checking of the inventory, that it would add a large number of minor items, like that tickler. The riprap at Marquette and at Michigamme was again omitted in 1913; it should be in. The masonry for a bridge at Iron Bridge, or at one of the Ontonagon River crossings, omitted in 1911, has, I think, been corrected. The minor items, such as the tickler, which, if new, might

amount to $400 or $500 for the whole road, road crossings and structures of that sort, that we omitted, would not amount, in the aggregate, to any great sum. I feel that the large items are substantially correct.

You asked me a question in regard to omissions from the 1911 inventory, and I have in mind the fact that you wanted the buildings. Now, I have looked over some of the other schedules, and I noted a few of the omissions in the 1911 appraisal that I would like to call your attention to, in connection with my answer to the question last night.

In the land, there was omitted, in 1911: Fiborn Quarry branch,
22.75 acres; track rights, Lake St., 7,416 feet; Marquette
206 Quarry right of way, .87 acres; Negaunee and Palmer branch
track rights, 5,400 feet; Mary Charlotte branch track rights,
4,400 feet; Milwaukee Mine branch track rights, 9,200 feet; gravel pit, Covington, 20.3 acres; all included in 1913. Lot 6, block 4, Ishpeming, omitted both in 1911 and 1913. (Several of these were discovered and inserted in the course of the 1911 appraisal or testimony.) The riprap at Marquette and Michigamme was omitted both in 1911 and 1913.

In 1913, there was intentionally omitted the work that has been done since the appraisal of 1911 in connection with the widening of fills, and so on, 70 miles of line west of Nestoria; a very considerable yardage of earth has been added in that work. I think it should appear under grading, and, in case of a re-measurement of all earthwork on the road, would, in my opinion, very greatly increase the number of cubic yards of earthwork, as estimated. It was done in connection with re-ballasting. I added nothing to my ballast estimate on account of the new ballast; nor the graduation on account of it. I know, and was over, the general territory covered; I should say it was in the hundreds of thousands of yards—a large yardage.

In bridges, trestles and culverts, there appear in the 1913 schedule 73 culverts which do not appear in the 1911 appraisal, all of which have been built within the last three or four years; how many of these were in place in 1911 I have no means of knowing.

Additional braces were added to bridges, making a very considerable increase in timber, but the difficulty of securing the data to make a reliable estimate was so great that no attempt was made to do it.

In 1911, there was no inclusion for bridges, trestles and culverts
on branches; nor is there any in 1913. There was, in fact, a
207 num'er of culverts on the Palmer, Dead River, Mary Char-
lotte and Weidman branches—not large, any of them; the largest is, perhaps, 10 or 12 feet opening.

On my last trip to Marquette, I noted, in connection with the track approaching the roundhouse from the west, two long culverts, built of logs, an aggregate length of 250 feet, not included in either appraisal. No allowance has been made for furniture or property of plaintiff in Detroit, or in cities other than those along the line of the road, and no allocation has been — to Michigan of any of the general office property located in Minnesota.

Plaintiff has two or three gasoline motor cars which were not included in 1911 or 1913. It also has 12 or 15 track velocipedes, costing $35 to $40 each, not included in either valuation. In 1911, a considerable amount of snow fence was omitted. In 1913, the 1911 schedule of roadway and construction tools was adopted, without change; owing to the large number of extra track forces, there is a considerable increase in the amount of these tools. There is no inclusion in 1913 of piping for the pintsch gas at Marquette or the Soo.

In 1913, the old dining car included in 1911 had been rebuilt, and it was included in the 1913 appraisal at $2,000, which is ridiculous; the car is worth several times that. In neither valuation are items of car cleaners' tools, and numerous minor items, which might be enumerated, and which must be there.

A 650 foot siding at Negaunee, north of the north main track, past the passenger depot, has been changed in allocation from freight to common, it being used for storing both freight and passenger cars.

208 Of the velocipedes which I have said were omitted, I have seen velocipedes on the road, and find the engineering department has two or three, the bridge foremen and linemen some, and each roadmaster one. I do not know whether they have 10 or 15, altogether; the cost is $35 to $40 each. I understand there are three gasoline motor cars, acquired since the 1911 appraisal; I do not know the cost.

As to the furniture in the offices of the line, I do not know what they had in the way of offices, other than at Detroit. My information about the Detroit office is by having seen the sign. I do not know who holds the title to the office property.

The tools which I say were omitted are capable of inventory.

The pintsch gas pipes are capable of inventory, and have been installed at the Soo since 1911 appraisal. There were items of property included in the 1911 appraisal that were omitted in the 1913 appraisal; they were included in 1911 on the theory that I should include in the report all the property in the service of the *property* and transportation, or which was, in my opinion, reasonably necessary for that service, or which had been or might be used, on the theory that the question of inclusion or exclusion of items of value was not an engineering question. I made no explanation of the use of any item in either 1911 or 1913 appraisal, except as I have testified regarding it. I included quite a few items in 1911 excluded in 1913; e. g., the Martel furnace lands and tracks.

Of land, I have omitted quite a considerable number of descriptions that I included before. Items that have been marked as "questioned," and not allocated to freight, passenger or common service, and which are not in use today, and were not in 1911. In minor instances, lands not in use today were in use in 1911, and vice versa.

209 RIGGS.

Redirect examination.

By Mr. Eldredge:

I have allocated the land occupied by sidetracks which are used for freight and passenger service, and allocated in Complt.'s Ex. 1*a*. Riggs; where land occupied by sidetracks was not allocated in Ex. 1*b*, I have now allocated land occupied by exclusive freight and passenger sidetracks on such unallocated right of way.

These totals do not include allocation to freight or passenger made at the previous hearing, on the map, and which are allocated in Complt.'s Ex. 1*c*, Riggs. They do not include allocations of sidetracks, where the lands on which the sidetracks rest have been allocated to the same service as the sidetracks. They are additions to allocations made in Ex. 1*a*.

RIGGS.

Recross-examination.

By Mr. Wykes:

Passing tracks on South Shore would average about six miles apart; some are less, and some slightly more. The passing tracks are all located to common, and run in length from 1,400 to 2,000 feet. The length of the passing track is regulated by the length of the train which must pass. The freight train, being of inferior class, always takes the siding as against the passenger train; that is not invariable, as, in the case of an extremely long freight train, or where the freight train load is practically at the limit of the locomotive tractive power, the passenger train is often sidetracked.

The meeting of two freights and a passenger, or two passengers and a freight, or a regularly scheduled meeting point of two passenger trains, with any other trains, in the yard, would make the two
210 tracks desirable. I feel confident that the amount of passing track allocated to common is not excessive, and that it would not be excessive assuming the elimination of freight traffic and the necessity of operating passenger trains under conditions of weather and delays likely to be encountered in the Upper Peninsula, with reasonable prospects of getting trains over the road and making up time. I mean that moving passenger trains, frequently late, which have to make up time, requires frequent passing tracks, that the road may be clear, and that with any passenger movement in the opposite direction long space between passing tracks might, or would, seriously delay the passenger movement.

In other words, the passing tracks should be close together, to permit the trains to run as close together as possible before taking the siding. Having them within six miles of each other permits you to give a free running space of 10 to 15 miles, or even less, while under other conditions it might take 30 miles.

RIGGS.

Redirect examination.

By Mr. Eldredge:

The 20 acres, station grounds at Michigamme, is for the purpose of including the ends of sidetracks and clearance ground at each end; not to exceed five or six acres is used for station buildings, warehouses and other purposes, in the center of the town. In allowing station grounds within 1,200 feet limit, I was not influenced by Michigan decisions as to the extent of station grounds which must be fenced. The acreage was placed for station grounds as being the amount of land within what might be called yard limits—the working limits of sidetracks.

Wherever there is a country village, and a separate item of land, at that point, which includes the total acreage within the side-
211 track limits, and without the working limits at either end of the sidetrack, I have followed this rule. The value of the land had nothing to do with my determination of the limits of station grounds.

RIGGS.

Recross-examination.

By Mr. Wykes:

If you are going to consider clearing as an element of the value of land, as in the case of farm land, where stumps are removed and agricultural land is secured, you must have a good quality of agricultural land, to raise the price equivalent to the amount expended for clearing and grubbing. I apprehend that clearing and grubbing in the case of a railroad cannot be separated from the construction, and, irrespective of what the cost of the land may be, or what the value of the adjacent land may be after it is cleared, the cost of clearing and grubbing remains one of the essential items of cost in building the road, and must be treated in the same manner as grading, or any other expense necessary to fit that land for its use as a railroad right of way or terminal.

On a jack pine plain, where it would be necessary to spend $40 an acre to clear and grub land that could be purchased for $2, I do not see how that would raise the value of your land to $42, as land. It would leave the $2 an acre as an element of value to the railroad for land, and the $40 as an item of construction cost in getting the ground ready to build the embankments.

A strip cleared through a cut-over 40 or 80 acres of land would not add any value to the cut-over lands, as land, any more than the clearing, grubbing and grading of the railroad right of way would
212 add anything to the value of adjacent stump land, or jack pine land, as lands, but I do consider it worth to the railroad what it cost, as an element of construction cost. A strip of cleared

land 100 feet wide through 40 or 80 acres of cut-over land of the character of the shrubbery and timber growing along the South Shore would, if left a few years, be grown over again; this indicates that the item of clearing and grubbing requires maintenance just exactly as any form of track construction does. The right of way must be kept clear, on account of fire; also for the vision of the engineer, the non-interference with telegraph wires, and other purposes. It does require constant maintenance, and an un-sual cutting and burning of the right of way to keep it in the condition now on the South Shore.

On February 21, 1914.

RIGGS, recalled.

Further cross-examination.

By Mr. Wykes:

In comparing the cost of maintenance of main line switches with a through stretch of main line without a switch, there would be considerably more maintenance at the switch, on account of the necessity of always keeping the main line rails in absolutely safe condition at the switch point and the point of the frog. At the location of the switch there is a higher maintenance cost, due to the fact that there is an increased investment at that particular spot.

The cost of maintenance on a mile of track where there are a number of switches would be markedly more, I think, than on another mile, where there are no switches. The number of main line switches outside of the necessary passing track switches would be comparatively small, and I do not think would appreciably add to the total cost of maintenance per mile. The added maintenance
213 at the switch is due, primarily, to the necessity of keeping the main line track in safe condition for high speed movement. A switch in the back end of a yard, with nothing but slow switching movement, does not need or receive anywhere near as much maintenance as a main line switch. The wear on the switch and frogs is due both to main line movements and to sidetrack movements.

Due to the use of the switch, and to the fact that the switch point moves,—is open and closed,—it is absolutely essential to keep that in perfect working order, to permit high speed main line movements over it. Even if there were only movements over it once in a while, more work would be necessary than there would be on an unbroken rail.

All main line switches have lamps, that must be lighted every night and put our every morning; in general railroad practice, that duty falls on one of the station employees, or on the section foreman, if the switch is near a section house—generally, upon some regular employee of the company. At small stations, where there is but one agent and a few switches, it would be a part of that agent's duties to fill, take care of and clean the switch lamps.

The percentages of contingency on terminals and engineering

were, for 1913, 8.8%, and 1911, 7.9%, being, in both cases, the average contingency applied to all other items in the schedule. The increase in 1913 was due to the fact that land, which had borne 5% contingency in 1911, was not included in 1913 inventory.

I made no study of the car or train mileage of plaintiff for any purpose. I did not investigate the relative passenger and freight train mileage, but accepted the passenger and freight train mile as given me by Mr. Delf, and, further than knowing in a general way about how those percentages have run for three or four years, I have made no study whatever.

214 I made no study of the composition of trains, train weights, commodities carried, or things of that kind, whatsoever. I did not, other than as indicated by the train mileage, go into the question of track occupancy by the different services. I made no attempt to determine the time of use by the freight or by the passenger, except so far as I used the train mileage for that purpose. I made no investigation, personally, of either train or car mileage or occupation. I did not investigate the switching mileage, or the stational service.

I did not attempt to separate between the passenger and freight switching mileage other than in the application of an arbitrary percentage. I did not make any investigation of the comparative amount of train mileage, with the commodo-ties carried, in any way. I did not do this, for this or any other railroad, since 1911. I did not ascertain the ore train mileage previous to the testimony in Chicago. I made no investigation, and did not testify in any way, regarding mileage, except as to use mileage figures furnished my by the auditor for making certain arbitrary divisions. I did not examine the increases or decreases, or the relative ratios, of the different classes of train mileage, as between passenger and freight, for a number of years back. I have made no study whatever of the subject of train or car mileage, or traffic.

215 On July 17, 1912.

JOHN D. STRADLEY, a Witness called by Plaintiff.

Direct examination.

By Mr. Eldredge:

I am 66 years old; have lived in Soo since March, 1886. Have been in real estate business since 1886; have abstracted titles since 1888; have bought and sold a good deal of property, for myself and as agent. I know value of real estate at Soo; have bought country lands in Chippewa County; as an abstractor, the prices indicated by conveyances of record came to my knowledge.

I know property owned by Sault Ste. Marie Union Depot Co. (Complt.'s Ex. 3, Riggs, shown witness.) My estimate of its value, without improvements, is $168,000. Have special knowledge of value, by purchasing property adjoining; bought 8 lots last October, Nos. 26 to 33 inclusive, Johnson's subdivision of Private Land Claim 5, fronting Ridge and Emaline Sts. and running through from

street to street, for $16,000 cash. Depot Co. property is of greater value. I also bought part of Private Land Claim 7, 95.6 feet on Magazine St., running 172.26 feet on Emaline St., for $8,500; it is not as valuable as Depot Co. property. In 1910, I purchased part of Private Land Claim 7, lot 8, block 3, of Emaline Wood's Add., and east 11 feet of lot 9, block 3, same, for $17,000 and still hold it.

I made estimate of $168,000 by taking values, without reference to railroad or anything else; if you wanted to buy now, in a complete lot, it would cost more. If the railroad and its improvements were not there, I don't know as it could be sold off at that figure, but if it had to be acquired now, by purchase or condemnation, it would cost more.

I know D. S. S. & A. land extending from Mich. Lake Su-
216 perior Water Power Co. to Sixth and South Sts., averaging 1,175 feet long by 235 feet wide, 6-1/3 acres. I estimate value of that at $16,450. I know land fronting harbor, occupied by yard, width varying from 500 to 900 ft., made land extending into lake, total length 2,800 feet, 46.5 acres. It extends from Sixth St. to east line of American Brick Co. land, which is quarter line of section 12 extended, and is colored white, on plat, with red outline. In valuing that land, I divided it, estimating the water front out to harbor line at $350,000 and the 46-1/3 acres upland at $1,500 per acre average, or $69,750; I made the estimate from lot sales in adjacent additions.

I know land extending west from line of American Brick Co., 1,400 feet by 530 feet, 17.52 acres, bounded in red. I estimated that based on market value, $1,500 per acre, total $26,280. You couldn't buy it for that. I know land, 1,950 feet by 225 feet extending west of property last described to end of joint yards, 10.7 acres, bounded in red. I estimated that at $1,500 per acre, or $15,105.

A description omitted from Riggs' estimate, is D., S. S. & A. lands Portage Ave. to Water Power Canal, indicated in red. It includes 3 pieces, the triangular east of Meridian St., 75 feet on Portage Ave., that part west of Meridian and North of Spruce Sts., and a little piece, about 200 feet wide between Spruce St. and Power Canal. I valued that at $32,600. The triangular piece on Portage is described in Complt.'s Ex. 1, Riggs, as belonging to the M., St. P. & S. S. M.; it belongs to plaintiff.

My estimates of plaintiff's property are based on sales in
217 vicinity. In Ready's Add., lots (6.6 to acre) were held at as high as $500, the average of sales about $400 to $500. Also in South Shore Add., lots (6.9 to acre) held at $350 to $400. Adjacent and contiguous land of South Shore and Soo Line is adapted to same purposes, and of same value. In Chandler's Add., further west on Easterday Ave., approximately in same vicinity, smaller lots run about the same price. Algonquin, Scranton's and Foss & Hyde's Addition, further east, are shown on map. There are 3 or 4 additions further South and West. The Peninsula Land Co. Add. adjoins D., S. S. & A. on north.

I know of sales, at prices named, in all additions except Ready's. From sales and prices at which lots are held, I estimate my value of

the lands; have some for sale there as agent. I have not sold lots lately at prices named, but have heretofore; what I hold now are held at those prices.

I know the triangle (10.55 acres) shown in three pieces in Complt.'s Ex. 3, Riggs, owned by Soo line, bounded on north by Spruce St.; parcel described as 1,320 feet by 887 feet, average, less highway, 24.84 acres; also tract averaging 360 feet by 2,080 feet, 17.19 acres; also triangle bounded by Sixth Ave., South Shore Add., and D., S. S. & A., 8.094 acres; also tract between Portage St. and Power Canal, 7.274 acres, belonging to plaintiff. The value of the 5 last named tracts, a total of 69.687 acres, is $1,500 an acre, or $104,530.

I know the value of the tract between South St. and Power Canal, 16.356 acres, with which I include .57 acre, north of canal and south of D., S. S. & A. This small piece, omitted from the list, is shown in yellow on Complt.'s Ex. 3. The two descriptions are worth $52,-
500. I value them separately, by feet frontage. I have
218 knowledge as to that tract, as it adjoins plats adapted for same purposes where lands are held at prices given. I calculated value by squaring it on a basis of 740 feet frontage on South St., next to power canal, and put the value through entire length at rate of $70 a foot.

I have a general knowledge of lands along South Shore in Chippewa County. I have had over two years' experience in acquiring railroad right of way.

Q. From your experience, how many times the actual value of the land acquired would it cost for the expenses and damages; i. e., what is the ratio between the value of the land in its naked state and the cost of acquirement? (Objection, that there is no fixed relation between value and cost.)

A. Here, where large blocks of land are owned by one party, it would be 2.5 or 3 times as much.

Value of rural lands in Chippewa County along South Shore for right of way, including station grounds outside of Soo, would average $25 an acre, subject to timber rights. If damage and cost of acquirement is added, I think it would cost 2 to 2.5 times as much, or $50 to $60 an acre.

219 STRADLEY.

Cross-examination.

By Mr. Wykes:

I figured terminal company's property in feet by lots; it would be from lots 1 to 18 and 21 to 30 inclusive, in block 1 of Scranton & Robertson's Add. I estimated cost per front foot of these lands I bought, and added a little for difference in value of railroad lands. Lots on the west side are not as valuable as those on east side. I figured at $80 a foot, regardless of depth.

Depot was formerly on Spruce St., way out west end; the business men wanted it nearer town, and they raised a fund to help get it

down there. My recollection is it cost the railroad over $50,000, but I am not sure. Some citizens put as high as $1,500 in pot.

The first tract, 8 lots, 26 to 33, Johnson's Sub., on which I based my estimate of $168,000, fronts Emaline St., across from railroad yards; it was purchased in 1911, at a little over $70 a front foot.

The second piece I purchased, corner Magazine and Emaline Sts., south of freight depot, I purchased in 1904, for $8,500.

The third piece (2 parcels), lot on corner Ridge and Magazine Sts., part of same claim, and lot 8 and the east 11 feet of lot 9, block 3 of Emaline Wood's Add., I bought in 1910. I didn't figure it by foot frontage.

I have been offered a piece, 52 feet on Magazine St., between the two pieces just described, part of private claim 7, for $10,000 cash; they won't take less. The business portion of town is more on Portage than on Ridge—east on Portage Ave. and south on Magazine St.

220 A piece recently listed for sale on corner Magazine (208 feet) and Portage (142.6 feet), just east of terminal ground, the owner will sell for $50,000, or he will sell 125 by 100 feet fronting either street for $37,500.

There is a store building on the south corner of the piece on Ridge St. Buildings are probably worth $2,000 altogether; there are some old shacks on north corner. To purchase this parcel would cost $168,000; it would cost more to buy it if they knew you wanted it.

Another sale in the neighborhood was the east 77 feet of lot 7, block 2, Emaline Wood's Add., 50 feet on Fort St., depth 77 feet, for $1,600. Another sale was the north 30 feet of lot 11, block 2, for $800; the balance of it, 66 by 50 feet, for $1,200. Nothing but some little, cheap shells of houses on them, renting for $6 a month. Another sale was lot 5, block 3, Emaline Wood's Add., for $2,000; also lot 7, block 3, same addition, $2,200; also lot 10, block 3, same addition, $3,500. I think the last is closed; there are two little houses on it.

In the next plat west, Scranton and Robertson's Add., Standard Oil Co., in 1904, bought balance of block 1, that railroad company didn't get—half of lot 31 and lots 32 to 36 inclusive. They paid $3,600, which was considerably under the price paid for the corner, but Standard Oil Co. built a spur and let former owners have rights over it.

I just picked sales recently made. There are many other sales, but they have buildings, which made price higher. I took sales, as near as I could, to get land value without improvements; some cost more, some less. These transactions I know were made, and I know the price.

221 As to the second parcel, a circular piece of 6.5 acres, directly south of power canal, I judge its value on market price of lots in Ready's Add., directly east, and other lots in that vicitity. I didn't see what sales there had been in that addition, or in Shafer's Add., east of that, but know what they hold property at. I have property there for sale at those prices. I have held some without sales for a long time at those prices, and some only a short time.

Lots in Ready's Add. are 35.7 by 105 feet, a little over 7 to the acre; I figured 6 to the acre, at $500, or $3,000 an acre.

I estimated the value of the second piece described, south of power canal, by the lot, on the basis of 6 to the acre, and then put on an average value of $70 a front foot on the canal. That is less than it would come to, figuring by lots. It averages 235 feet wide. I took the Ready lots to get a basis to figure from. I just put that $70 as an average of value, without computation.

The parcel of 46 acres, in which I included $350,000 for submerged lands, runs from shore line to dock line. I figured water frontage at 2,000 feet. I figured it on same basis as Judge Dennison figured lands across canal in the Chandler-Dunbar suit. He figured water front at $550,000 and upland at $102,312. There are no structures on the submerged land I valued. Area of made land beyond dock or meandered line is 7.5 acres.

Another sale was recently made near this; George Kemp bought from Northwestern Leather Co. 250 feet front on dock line by 600 feet deep for $12,500, for coal dock. That is further out than this land we are talking about—all submerged lands.

222 I put $1,500 an acre on remainder of 46 acres, based on value of lots in adjacent additions—Chandler's, Foss and Hyde's, Scranton's, and Peninsula Land Company's subdivisions. They built a $35,000 schoolhouse right next to D. S. S. & A. That shows it is pretty good land. As to the sales in those additions which I took for a basis for my $1,500 per acre, a lot out near Algonquin brought $300 or $400. Those properties are not changing hands much, as they are owned by employees of tanneries and mills. Five hundred dollars was loaned on two vacant lots in block 2 of South Shore Add.

South of the railroad track and west of Sixth St. and Fort Brady, in Foss and Hyde's second addition, are lots held for less money, but none at less than $200; they run from $200 to $400. In Foss and Hyde's Add., lot 2 in block 1 sold for $650.

I know of no sales of unplatted lands out there; people who own those lots are not offering them for sale. Between Fort Brady and Algonquin are vacant lands in tracts of 20 and 40 acres—a garden community. They are all holding on, same as I am.

In the country, I valued rural lands at $25 an acre for the land, including all stations except the Soo. I made no distinction between station and country right of way; I lumped it. Some you would get for nothing, as it belongs to the Government, withdrawn for forest reserve; excluding that, some of the rest they would get at a very low price; some would be given by companies who want a road through. If you got below $25 an acre, you generally got it for nothing. When the railroad cuts across a farmer's 40 acres, he will sell the 40 acres nearly as cheap as the right of way, for he doesn't want his farm cut in two.

223 That, and the work of negotiating with owners, is the reason I said it would cost from two to three and sometimes five times the cost of the land to get it. There are 12 acres (12.12) to

the mile in a 100-foot right of way, and sometimes you spend a couple of hundred dollars to get it; that is my experience.

On December 31, 1913.

STRADLEY recalled by plaintiff.

Direct examination.

By Mr. Eldredge:

In my judgment, the value of the tract of land owned by the Sault Ste. Marie Union Depot Co. is $198,000, which is more than I valued the same property at in previous testimony. When I testified before, I made a conservative estimate, without great care about going into the thing very thoroughly, but I stated at that time that it was way below what I considered its value, and this time I made a more careful study of it, and, it being divided up into different tracts, I had to get at it on a different basis of valuation. I was asked to estimate the value of these different tracts separately, and, in order to do so, I had to go into the subject more thoroughly, and I discovered I had made the values too low. The other time was simply by estimated front foot value; this time by actual square foot values. I considered actual sales of property adjacent.

I valued the 3.29 acre tract colored red at 55¢ a square foot. I arrived at that value by figuring actual prices paid for property adjacent. I paid $8,500 for a part of private land claim 7, with a frontage on Magazine St. of 95.6 feet and on Emaline St. of 172.26 feet, with a total of 14,349 square feet.

224 Lot 2 of block 3 of Wood's Add. and a part of private land claim 7, on the corner of Ridge and Magazine Sts., and lot 8 and the east 11 feet of lot 9 of block 3 of Wood's Add., containing altogether 9,666 square feet, was purchased at $17,000. Lots 26 to 33 of Johnson's Sub., 30,660 square feet, were sold at $16,000. Lot 7, block 3, Wood's Add., 4,896 square feet, was sold at $2,200; lot 5, block 3, Wood's Add., 4,800 square feet, at $2,000; east 77 feet of lot 7, block 2, Wood's Add., 3,850 square feet, $1,600.

The total square feet in the above tracts sold was 77,671 and the total purchase price $47,300. I deducted buildings and improvements, $6,000, a very liberal estimate, leaving $41,300, or 53.2 cents a square foot. That is for property not as valuable as union depot tract, and for that reason I have made it 55¢ straight per square foot; I don't think that quite enough. I applied this 55¢ to the 3.29 acres and to the .92 acre strip on Portage Ave.

I applied 53.2¢ per square foot to the tract, 1.91 acres on Complt.'s Ex. 3*a*, Riggs. That is what the property on which I based my values came to; if anything, it is more valuable. The purchases I referred to are all purchases made by or through me. The tract on the corner of Emaline and Magazine Sts. has some wooden shell buildings, not worth $1,000. I deducted $2,000 for the buildings on lots 5 and 7, block 6. There is a little store and a house on the

corner of Magazine and Ridge Sts., and a house on lot 2, for all of which I deducted $3,000. The most valuable building deducted was at the corner of Magazine and Ridge. The buildings are all rented for a total rent of a little over $600 a year, which hardly pays interest, taxes and insurance.

225 The 3.15 acres owned by the Soo Depot Co. I valued at 37.5¢ per square foot, arrived at by using these figures and others and striking a mean between the two. That is below what it ought to be, I think. I took some valuations in Scranton and Robertson's Add. into consideration. I just tried to strike a mean between that and the other property. I think the value ought to be a little higher, but I put it at 37.5¢, as that was back further.

My value for the 1.91 acres is $44,257, and for the 3.15 acres, $51,455. I don't think you could buy those properties at the prices if it was in private ownership. You could perhaps buy pieces of it for less, but for some you would have to pay a good deal more, so the aggregate would be above the prices I give.

The triangle, 75 by 208 feet, Portage and Meridian, owned by plaintiff, I have valued at 25¢ a square foot, $3,920, which is its present fair market value. I would have put it at 37.5¢, but there is a break between it and the other tract on Portage Ave.; two lots out there. I took into consideration that it is in triangular shape and not as valuable as if square.

I know the tract belonging to plaintiff, 204 feet on Portage Ave., 850 feet on Meridian St. and 410 feet on Spruce St., and have valued the 3.1 acres in railroad use, No. 3, marked green on the map. I valued that at 12.5¢ a square foot, $16,879.50.

The .12 acre (item 4, Complt.'s Ex. 1*b*. Riggs) and the .18 acre (part of item 9) tracts I also valued at 12.5¢ per square foot, $653 and $980. The rest of item 4 is .23 acre, and the rest of 9 is

226 .37 acre. If these tracts (on 3, 4 and 9, within black lines) were together, I would make the value a little higher. The basis of value that I figured from was 14.17¢ per square foot, being the sale price immediately adjacent. I took as a basis sales of lots 1 and 2, block 2 of Scranton and Robertson's Add., 7,392 square feet, at $700, lot 25 of block 2, 3,748.5 square feet, $357; lots 221 to 224, 10,794 square feet, $2,060, lot 36 of block 3, 2,698.5 square feet, at $400, and lot 8, block 3, 2,698.5 square feet, $357. The average price of the above sales was 14.17¢ per square feet. That property is adjacent to this, and of equal value. The sales were two each, in 1910, 1912 and 1913. These were actual transactions.

I value the land in parcel 5 of Complt.'s Ex. 1*b*, Riggs, Chippewa County, at 6¢ per square foot, total $16,988. Item 10 I valued at 6¢ a square foot, a total of $21,693. In my judgment, this value was less than other property immediately joining has been selling for. I based my price on actual sales of property in Shafer's Add., and I took into account the prices of lots in Reidy's Add. The price of lots sold in Shafer's Add. amounted to 7.44¢ a square foot. Item 10 is as good property and would sell as quickly at the same price. A street car line runs through it, and it fronts on Meridian St.

I value item 6 at 5¢ a square foot, $53,012.50. In my judgment,

the value of that tract at present is the amount stated. If anything, my prices are all a little low. I figure the 2.5 acres at $5,445, the 16.82 acres at $36,633.95, and the 5.02 acres, corrected to 4.77 acres, at $10,933.55. I did not figure the 5.23 acre tract, but would put the same value on it. I got my basis from sales of lots in South Shore Add. These were actual sales, and averaged 5.13¢ a square
227 foot. There were three lots sold in South Shore Add. and three in Chandler's 3rd Add., all separate, in 1910, 1911, 1912 and 1913.

I value parcel 7, Complt.'s Ex. 1*b*, at 4¢ a square foot, 15.06 acres. $26,239.76, which is in my judgment its fair market value at present. This price also covers the wye in item 13. I arrived at this value from actual sales of adjacent land, three in Chandler's Third Add. and two in Foss and Hyde's Add. There were other sales at the same prices. On the other addition referred to, there were sales of other lots at the same figures.

I value item 8 at 4.25¢ a square foot, 9.57 acres, $17,716.93. That is a little higher than the tract east, because of the settlement at Algonquin. It has the tannery and the mills, and is quite a little town. I base my price on four sales of lots in Scranton's and Foss and Hyde's Additions, in 1908, 1910 and 1912, averaging to 4.94¢ a square foot.

All these valuations are higher than those I made of the same property on an acreage basis. I figured it out more nearly to its actual market value, and studied it a little more. If the railroad were removed, I don't know if the land could be sold right away; that would be a pretty hard proposition, but you could not buy it now for the figures I have put on it. You can't sell property until somebody wants it. I think that property, if platted and well advertised, could be sold at auction at those prices, pretty near, pretty soon, the way things are coming. I think the prices represent the fair market value of the property at the present time. I have not considered railroads at all; just the values of adjacent property, actual sales for use for buildings, residences, and other things, by people who bought to improve.

228 I know the value of the right of way of plaintiff from the joint yards at the Soo to Brimley. It runs right off from the high price land into unimproved land. It would average $200 an acre for 2½ miles ,to the city limits. There is platted land on both sides of it. On one side is Algonquin Sub., selling, per lot, at something about the prices given here; farther out in Hall's Add., and after that undeveloped land. There are no sales to go by. The land all along the railroad there is held in large tracts. The power company bought about 600 acres and is negotiating for more. It is right along the railroad, running out practically to the city limits. The river is close by. I own land outside the city limits which I would not sell for $200 an acre; it is not in the market. In all my valuations, I valued the naked land, without improvements.

The value of plaintiff's right of way from the Soo limits to Brimley, exclusive of timber and improvements, is at least $15 an acre. At Brimley, there is quite a town, and basing the value estimated

from actual sales I should say the land is worth $100 an acre through Brimley and, say, one-half mile on each side. A lot 50 by 114 sold for $100; less than an acre on the river sold for $400; .8 acre sold for $135, close to railroad, nearly ¼ mile west of station; about one-third of an acre sold for $125; two acres south of the village, not on the railroad, but over ¼ mile west of station, part of N. E./N. E. 8-46-2, sold for $209; 1.25 acres, a little south and east, sold for $150. These were all vacant lands. About .17 acre in section 8 sold for $157.37, and .4 of an acre in S. E./S. E. 5-47-2 sold for $125. Brimley is quite a nice little town. Five or six hundred people live in and around there.

229 STRADLEY.

Cross-examination.

By Mr. Wykes:

Item 1, Complt.'s Ex. 1*b*, was acquired by the Union Depot Co. before 1904. No comparison can be made with the prices now and the prices they paid, as the move was on the part of citizens and business men, who, to have the depot moved from Spruce St. and the freight depot further down, so it would be more convenient to the city, undertook to furnish a large percentage of the land. They formed a pool, and got special prices from some land owners. Some of the land was donated, and the railroad company paid the balance. My recollection is that the railroad company paid about $50,000. I don't know just how much the citizens paid; I know they paid sums all the way from $100 to $1,500. The property is worth considerably more today than it was then. Values have advanced since then; at that time I don't think you could have bought it, without that arrangement, at the price I have fixed on it.

The sales on the corners of Emaline and Magazine Sts. and Ridge and Magazine Sts., and lot 8 and a part of lot 9 and lot 2 of block 3 and lot 7 were to myself. Lot 5 was to A. J. Clergue; lot 7, block 2, was to F. W. Clark; lots 26 to 33 of Johnson's Sub. to my wife. There have been other sales in block 3, but not recently. I have been trying to buy a little piece in block 3, 52.2 by 68.8 by 172.26, 10,451 square feet, and their price is $10,000. There is an old house there, not rented. I haven't cared to buy it at that price.

I have been offered the balance of lot 9, block 3, for $2,500. It has an old building that has been burned out; not much good. None of the buildings in this block, except one, are worth much. They are cheap—no cellars, basements or foundations. I am buy-
230 ing the property at present for myself and others. I thought it a good buy. I have been picking it up for the last ten years, as I saw a chance. I haven't tried to force the purchases, but have bought just as cheap as I could for cash. There is no present arrangement between me and the railroad company that they shall take this property. I never had any talk with any person connected with this railroad in reference to its purchase. I had in mind, in

buying, that in time to come the new railroad that the Grand Trunk is thinking about will come in and take this site.

There are no other sales in Johnson's Add. within 10 years of lots fronting on Emaline or Ridge Sts. I didn't look up to see if there were sales in blocks 4, 5, 6 or 7, and in Johnson's Add. I didn't go into the second block south of the railroad. I took no sales south of Ridge St. The lots in Johnson's Add. belong to the same people of whom I bought lots 26 to 33. I took sales in both blocks 2 and 3 of Scranton and Robertson's Add. I figured nothing in block 1, as the Standard Oil Co. is in block 1, next to the railroad. There was some deal to get them located by the people who owned these blocks, thinking they would make a market for the balance of their property and get a switch in there. I do not know when the Standard Oil bought that property and located there. It was since the depot grounds were obtained. Private land claim 4 has never been platted or subdivided. I do not know the price on that; it would not be as valuable as the lots to which I have been testifying.

Blocks 2 and 3 of Scranton and Robertson's Add. were all vacant lots. There are probably four or five houses now along Spruce St. They are of a character not to increase the value of the property, and up above there they have had for some time a wood yard or
231 place to unload lime, brick and building material. Those two blocks are mostly vacant. There are a few houses there, but what they are I don't know. There have been other sales, within — years, than those given, but at the same prices I gave. I took the lowest and the high prices; I took all that were different. I do not know how many there were at the highest price or at the lowest. Several lots were sold at $357 cash. I did not go back of 1910. The subdivision has been made a good while—before the Spanish war.

The boom was in 1887 and 1888. They have had property up to boom prices right along, ever since, except where some fellow would get tired and let go. The taxes were levied on boom prices, and owners of outlying property would get tired and let go. The taxes on a ¼ interest I owned in S. W./N. E. 11-47-1 were over $28. This property is just west of Scranton's Add., the first land not platted south of the track. The city was organized from a village, and the limits fixed, in 1887. There has never been any real effort to reduce the size of the city.

There are a few lots in Reidy's Add. where taxes are delinquent, because they are non-resident owners and they put on a heavy sewer tax three or four years ago. I had no sales in Reidy's Add. I know what lots are held at by Reidy and others, and I have two or three lots there for sale for non-residents; they hold them at higher prices than I named here. I know of no sales at those prices.

Reidy's Shafer's and Eureka's Additions are pretty well built up. Forest Poole has been holding a vacant lot on Eureka St. for $450, and two other lots there have been held at the same price. An expansion sewer has gone in there. Prior to 1910, I sold a lot, 50 by
117 feet, in Eureka Add. for $400. There was a sale in
232 South Shore Add. in 1910, to Julia Vogt, who borrowed $500 on two lots, 40 by 100 feet each; I think she paid a little

more than that for the lots. There was another sale there last June, of a lot 40 by 100 feet, for $250. There are quite a number of houses on that plat.

I have no other sales there, back to 1910. I have a lot of other lots for sale there for $300, and have had offers of $250 for two lots near these that Miss Vogt bought this summer. Her lots are 9 and 10, block 2 of South Shore Add., and these other two lots were either 13 and 14 or 14 and 15 of block 2, not on the car line. My client declined the $250, and said he wouldn't sell for less than $300 apiece. The unplatted parcel west and south of South Shore Add. belongs to Judge Steere; that is the east half of N. E. Mr. Chandler owns the east half of N. W. lying south of the railroad. I do not know what either Chandler or Steere hold their descriptions at. Opposite their land, I figured the railroad land at 5¢ a square foot, or $2,178 an acre.

The Soo is well supplied with platted lands at present. During the boom they platted way out in the country; one addition of 80 acres was six miles out. There are houses on Chandler's Third Add., but I don't know how many. The last sales I have there were in 1912, lots 7, block 1, 40 by 120 feet, $225, and 2, block 2, 40 by 125 feet, $200. I think there were others, but all the same. Chandler still owns some lots there. He might reduce the price on the entire bunch of lots. He is not pushing the sales.

There isn't anything in the market outside of the "Y." I have no sales in Peninsular Land Co. Sub. It belongs to the Northwestern Leather Co., and built over by them for their employees; it has a schoolhouse, church and mills. The city limits are about 8
233 miles apart, east and west, and 3 miles north and south. The census was 13,600 people; we claim between 15,000 and 20,000, as the past three years we have been growing.

A good deal of the land south of that shown on Complt.'s Ex. 3*a*, Riggs, is farm land. A lot of it is platted. It is about 1¾ miles from Chandler's Sub. to the south city limits. I have some wild farm land up there that I refused $100 an acre for. It is high ground and worth that as farming land. I think that forty which I spoke of is assessed at $800. I have some, right across, inside the city limits, exactly the same kind of land, assessed at $1,300 a forty, the same as they assessed the best farms with improvements. There is only one farm sale that I recollect, 40 acres four miles out, for $3,200. The land was good, cleared, and under cultivation, and all it had on it was an old hay shed, a well, and a little old house.

Description 15, Complt.'s Ex. 1*b*, Riggs, runs right through land purchased by the power company, which has 600 acres there. It was bought by Clergue several years ago. I have no sales opposite this description. The land there is all wild. There are farms back up on the hill, miles away. Charles S. Beedle sold to the Dupont Powder Co. .97 acres for a powder house out of the west half of N. E./S. E. 10-47-1, about ¼ of a mile from the railroad, price $250. It is northwest of the track, adjoining the new park and fair grounds.

A parcel of 90 acres, the S. E./N. W. and east half of S. W. 22-47-1, except the Soo Line right of way, sold for $3,100. One corner runs

down to the railroad. It is wild land, located, where it begins to go from the railroad, up on the bluff, about ¼ of a mile from the city limits. N. E./S. E. 22-47-1 (39 acres), about 1¼ miles
234 from the South Shore, sold for $1,200; it is about ½ a mile from the city limits and wild land. The north half of S. W./S. E. 22-47-1, about 1¾ miles from the South Shore and about ½ mile from the Soo Line, sold for $500. The other half of the same forty sold for the same price. All that land is rough and wild, near the edge of the bluff. The west half of S. W. 25-47-1 sold for $4,500. It has a pretty fair barn on it and a small house. It is about 3½ miles from the South Shore and two from the Soo Line. It was cleared land. As far as the value for farming purposes is concerned, the land on the bluff is no better than that on the bottom, which is good farming land. There are no farms along this 2½ miles, as it has been held in large holdings ever since the boom.

I have given all the sales opposite the 2¼ miles, within the 2½ mile limit. I do not know of any lands adjacent to the 2½ miles of item 15 that are for sale, nor what was paid for them, nor what they hold them at. I would not give the sale to the Dupont Co. very much consideration. I simply made an estimate from the other lands that we have been valuing at the end of the city. There are sales in Hall's Add., on the N. E./S. W. 11-47-1, that I didn't take, but I used them as sort of a basis. They are $75 and $100 a piece on tax titles. It was platted at the time of the boom, and all was sold for taxes. Quite a number of the lots have been sold at those prices by owners under tax titles. Hall's Add. is about 1¼ miles inside the west city limits, about two miles from the city limits along the South Shore. That is the last plat along the line of the road. Then it runs into the water power land until you get to the city limits.

The land from the city limits to Brimley adjacent to the track is practically wild. I have not had any sales of improved farm land anywhere in there. I do not know what improved farm lands
235 sell for in that part of the county, nor what they are held for out that way. I don't know of any being offered for sale. The S. W./S. E. 28-47-1 was sold at $200. It is 40 acres, about a mile from the South Shore and close to the Soo Line. The sale was from a sister to a brother. The country from the city limits to Brimley for a mile on each side of the South Shore is nearly all wild land. Little corners of farms touch it. I honestly think it is worth $25 an acre straight through. I say it is not less than $15. I do not know whether this particular description was cleared or improved or not.

There was an old contract of the D. M. & M. R. R. Co., under which S. E./S. E. 29 was sold for $260. The final payment was made in 1911. It was not cleared when bought, but is now partly cleared. It is now worth $40 or $50 an acre. It is within a few hundred feet of the railroad. My recollection is that $400 was borrowed on the forty acres, which would indicate a value of about $50.

In these transactions in lands which were outlying, my information as to price is usually taken from records. I wouldn't say that that was an absolutely accurate way of getting at it, because they

put considerations in sometimes high and sometimes low. Sometimes they want to cover the consideration to keep from having taxes boosted. Most of them are getting to do that. When they want to sell, they might inflate it, but not often. It is not always the fact that when they want to keep away from the tax they put in a dollar and other considerations. Some of those people insist on having a consideration of some kind put in.

With reference to those sales to which I have testified, I know the character of the land and its value from the general values of the land in that neighborhood aside from the consideration mentioned
236 in the deed. The considerations given in deeds are very low, way below what the value of the land is, as a rule. The fact is, we have no farmers up there. Although they have lots of farms, they are generally woodsmen. Their ideas of the value of farming lands are not scientific at all. These are not the people who make the demand for the farming territory at the present time. They are coming in from the outside and buying fast, but not putting their papers on record. In my office, last week, five contract sales were made of lands out in the county, none along the line of the railroad. They were in different directions and at prices three or four times those along the railroad.

The land for a mile through Brimley is cleared, and is good farm land. $100 an acre is quite a high price for the general territory along the railroad. At Brimley, it is right at a market. I would fix it at $60 for the average. No, I don't think I would; you can't clear the land and get them cleared for that, and buy them at the prices they have to pay now. Lands will run from $20 to $50 an acre to clear. It depends, of course, on the character of the timber that was on them; some of it will clear easy and some of it hard. You have to take that into consideration, and when you get it cleared it is worth more than the cost of clearing and land, I think, because it will produce, to pay interest on that. The sales I have given at Brimley were right around the settlement.

STRADLEY.

Redirect examination.

By Mr. Eldredge:

With reference to the 2½ miles of property within the city limits, covered by item 15, my valuation is based on the uses to which that property may be put, as well as upon prices for which portions
237 have been sold. I did not take into account, as affecting my value, the holding of the power company. I took it just as it lay there, other lands, the whole tract in there. I mentioned that as an incident that it was owned by that company. That property lies along the river and railroad. The fact that it is suitable land for sites which will have a water front is one element that might be considered, but I left that out. In the portion of the right of way between city limits and Brimley, I valued the land without timber or improvements.

238 On July 17, 1912.

HENRY HOFFMAN, a witness called by Plaintiff.

Direct examination.

By Mr. Eldredge:

I am a lawyer. I have lived in St. Ignace about 30 years; dealt some in lands in St. Ignace and Mackinaw Co.; acted as agent for Northern Michigan Railroad in acquiring property in St. Ignace. I own property and know value of lands there.

(Complt.'s Ex. 4, Riggs, shown witness.) I recognize property on map, described in Complt.'s Ex. 1, Riggs, as Humphrey lot, 136 x 1,650 feet, with riparian rights on 136 feet; present value is about $200 per acre, judging from other sales I have made; there is good water for dock purposes there.

Value of property described in Complt.'s Ex. 1, as right of way and dock property to Martel Furnance, 6,450 feet, 9.78 acres, independent of improvement by railway company, is $350 per acre.

I know plaintiff's dock property at St. Ignace; should judge there was 2,400 feet harbor frontage including land occupied by docks; I value it at $15 to $20 a foot—say $20 a foot.

The Plaintiff offered $4,000 for 160 feet of water front just northwest of its docks, but owner asked $16,000, so sale was not made. The Northern Michigan Co. paid $8,000 for about 950 feet of water front near Hazeltine St., extended, with some other property. The same company had arranged to buy the Jamison Lumber Co. property, which includes about 300 feet water front, for $10,000, but deal fell through. These properties are on shallow water, while plain-

239 tiffs property is on deep water and requires no expense for long docks or dredging.

Adjoining railroad, where it enters St. Ignace on northwest, is a bluff 100 to 150 feet high on one side and lake on the other; in city, bluff on one side and business streets on other. I do not know of any other entrance for railroad from that direction into city.

I know right of way from southeastern end of yards near roundhouse to water front, 50 to 75 feet in width. The value for any other purpose, if railroad were not there, is about $5 per lineal foot; cost of acquiring it would be $10 to $12 a lineal foot for the bare land. If it was not for the right of way there, that property would be used for business lots and would be worth $40 a front foot. All the property I have previously named, except Humphrey lot and the hotel lot, is devoted to railroad purposes.

HOFFMAN.

Cross-examination.

By Mr. Wykes:

First train passed over the line in December, 1881. Population of St. Ignace today is about 2,500; it was not over 700 or 800 then. As

to value of land along right of way, some lands are very much lower now than then; lands in the country are very much higher now than at that time. Country was just developing; before introduction of railroad it was unbroken wilderness from St. Ignace to Marquette. Allenville and Moran were unbroken forest then. St. Ignace then wasn't a village at all, settlement did not extend back from State St., except in a very few instances. The railroad right of way ran along where there were very few buildings. I think it would have cost fully as much, if not more, to acquire it then as it would
240 now, excepting damages now resulting from removal of buildings, etc.

As to land from old ship dock west to gravel pit (described in direct examination as right of way from southeastern end of yards to water front), at extreme easterly end, next to State St., the right of way leaves a gore between track and street 50 to 80 feet wide, which on account of its size and shape, is absolutely valueless for any purpose whatever. If it were not for this right of way, it could be used for business purposes, and would then be worth about $40 a foot, which amount entered into my average of $5 a foot on the whole strip. I took into consideration value given it by fact that the man owning an irregular piece next to it would probably purchase it to fill out his piece. Some portions of this right of way could be disposed of at very much more than $5 per foot to fill out lots adjacent to right of way, but average would be $5 per lineal foot.

Dock property of railroad, as above mentioned, 4,485 feet by the map, has only one railroad track on it. I don't think there are any railroad buildings on piece south of track; this is not shown on map.

It may be necessary, in order to construct a long dock on a curved shore, to have 3 or 4 times as much water frontage as that occupied by the dock, in order to protect dock owners' rights at outer extremity of dock; if you didn't, you would cross somebody else's land. This question has come up several times here.

I base my judgment as to value of these lands on what we had to pay for the land and other lands in locality; values are my
241 judgment. Don't know of any place in St. Ignace as well adapted to dock purposes as plaintiff's water front; farther down you are exposed to ice floes, and farther northwest two things combine to make it far less valuable, (1) you have to go so far out to get deep water, and (2) you do not have the sea room in this bay for the big car ferries to turn around. For that reason, I couldn't say how much more valuable this property is for the purpose than that purchased by the Northern Michigan R. R. Co.

The part of St. Ignace lying between the bluff and the water front is about 400 feet at the narrowest place, the right of way there being 20 or 25 feet above water level.

Piece of land marked "e" in lead pencil on map was acquired by Northern Michigan Railroad under same contract as piece marked "e" and the water front. Paid $8,000 for water front and lot "e" in the purchase, in order to get the water front; lot "e" (for which

$4,000 was paid) is a little bit more than "c" and had a building on it, worth about $1,200, renting for $7 a month.

I am D. S. S. & A. local attorney.

HOFFMAN.

Redirect examination.

By Mr. Eldredge:

I believe that part of water front, approximately 160 feet on State St., in blue color on map, between red lines, is essential to the railroad for the use of the docks which it actually has.

I have had experience in acquiring right of way for railroads; was engaged by Northern Michigan Railroad Co. to acquire its
242 right of way from St. Ignace to the Soo; I acquired about 2/3 of it. In some instances, I presume it cost at least 5 times what we had to pay for the land in order to get the right of way; this cost was made up in traveling expenses, attorney's fees, etc., and some of the land was covered with many years' taxes. We had no condemnation proceedings. I should say that 3 times the value of the land would be a conservative estimate of the cost.

On January 3, 1914.

HENRY HOFFMAN, Recalled by Plaintiff.

Direct examination.

By Mr. Eldredge:

I testified before that the average value of the water front at St. Ignace is about $20 a lineal foot, measured on the water's edge. I am still of that opinion. That portion of the water front in item 5, Mackinaw County, of Complt.'s Ex. 4*a*, Riggs, is the most valuable in St. Ignace, as it is not necessary to go very far out to get deep water, and then it is protected. Further east than the line between claims 9 and 10, the sea has a greater force on the situation, and further west, into east Moran Bay, the car ferries don't have sea room to swing around.

When I say $20 a lineal foot on the water's edge, I estimate in that frontage, and did before, all the land between there and State St. In my judgment, all that water front is in use. The situation there is such that it would be unwise for the railroad to part with any of it; it is necessary for the proper protection and use of the wharves now in the lake. This is my opinion, as I don't suppose it is possible for any person to decide without a court decree what is and what is not necessary for the protection of the ferry dock. It does
243 not require a court decree to determine that it requires that room for the ferry to back around in. The decree of court comes in determining the rights of adjoining land owners as fixed by the angle from the shore line to the thread of the bay. In my opinion, it would be unsafe to dispose of any of the land. It would

also require a court decree to determine what effect a structure built out there would have on the lumber and slip docks.

If the part of item 6 east of the red line and just west of the base of the slip dock was not owned by the company, others might build a wharf into the lake, which would make the easterly side of the lumber dock practically valueless for company uses. A wharf built midway between the lumber and slip docks and parallel with the former, might not materially interfere with its proper use, (boats could go in and back out), but what the rights of the parties would be between the lumber dock and the slip, as to extend the structure out into the water, I can't tell. Item 6, the water front, indicated in yellow, is only used in going out on this wharf—the lumber dock.

In item 3, the parcel of 1.36 acres, standing alone, would be of little value, but it is valuable to the city or to parties owning the land on both sides, Church to State Sts., to make a street, midway between the two streets, making a market for the land. For that purpose, in my opinion, it is worth $700 an acre. The triangle, .63 acres, would constitute just about a building lot; $100 is a fair value.

The .72 acre, 196 ft. on State St., is worth at least $40 a front foot on State St. for commercial purposes as there is no vacant street frontage on the south side of State St. in the market today be-
244 tween the wharves and Goodrow Alley. The narrow right of way commencing on the west side of State St. diagonally from the dock slip to the north line of private claim 18 is 3,170 ft., and worth $5 per lineal foot. In arriving at this estimate, I consider the uses that may be made of portions of it, and sales made of nearby property.

The triangle which it crosses, 150 ft. on State St., is worth $40 a foot front on State — for business purposes. A man who owns the land in the rear would be willing to pay that in order to make his land available for any purpose or the man who owns the triangular piece would be willing to purchase the land in the rear to make his piece avaliable for use. The triangular piece standing alone is not worth $40 a foot. I assumed that the other land could be acquired when I fixed my price. Some portions of this right of way are not worth $5 a foot. The piece immediately west of this, 160 ft., is, in my opinion, worth $10 per lineal foot for the use that may be made by selling to those who own lots between it and State St., and extending their lots.

There have not been many sales of real estate in St. Ignace. Lots 7 and 8, each 40 x 90, sold this past summer for $400 for the two, and the piece of land in the rear of lot six sold recently for $125, or 6¢ a square foot, and a little gore back of lots 4 and 5, 1,200 square feet, sold for $50. Another sale of a piece 50 x 100, at the corner of State St., and the alley at the foot of Portage St., was made for $800. A lot farther west on State St. in the same block, 25 x 90, sold for $400. The railroad right of way of 66 feet wide at $5 per lineal foot would be a little under 8¢ a square foot. The position the right of way taxes precludes extension of Church St. to Trucky St., and I have no
245 doubt that the right of way for 50 feet east of Trucky would be sold to the City for much more than $5 a lineal foot, for street extension.

In making my figures of $5 a lineal foot, I figured the first 150 feet from the easterly end at $40, the next 150 feet at $10, the next 424 feet at $6, the next 915 feet at $2, the next 723 feet at $2, and the next 800 feet at $2, making a total valuation, without the square piece of land, $15,860. The 915 feet is a strip of land between Trucky Street and the alley. The uses which could be made of that would be for a street between those two points, on both sides of which lots could be laid out.

(Stipulated Item 8 is worth $100 per acre, and each acre of the same value.)

I have had no experience in determining the shore area it takes to afford proper space for use of a dock. I have not had any experience as to what the man who runs the boat would find necessary. As to that particular point, I am simply applying what I regard common sense. The usual way in which the car ferry is operated is: As it backs out of the slip, it swings around to the south and gets its bearings, comes around to the north and circles around to the east, and gets on its course. I would not say the railroad would invest in very much of the shore line to permit it to do that. While undoubtedly the ferry could be operated in a way which would not require so much of a protection from structures built out from the easterly end of this railroad water front, yet it is a convenience to do that, and in order to protect its rights to enable it to do that it would be to the best
246 interests of the road to own the water front. I would not think it reasonable for the railroad to maintain a large investment in shore land simply to permit the boat to turn around. I only mention that is one thing why it is necessary and perhaps of advantage to own that water front. Another necessary thing is to protect the proper use of the big dock south of the slip dock. In my opinion it would be unwise to part with any of that water front.

The value I place on the narrow right of way in St. Ignace assumes its use in connection with the adjoining property, sales to adjoining owners, and the uses that may be made of it for streets. The land ownerships adjacent to this right of way on both sides are pretty well cut up; it is held in many different irregular tracts. Some of this strip would sell readily and quickly for more than the figures I give. It would take some time to get your abstracts and to divide it among the people and make all other arrangements. I haven't deducted that from my price. This strip couldn't be sold and turned over to private owners all at once. I have never had charge of the adjustment of anything comparable with this, nor heard of anyone else doing it. My value contemplates that this land may be used for other purposes than railroad right of way, for the extension of lots for streets, and for building lots. Some of it without being united with the adjacent property would not be worth much except for a railroad or for a street. In the strip as it is at the present it would not be worth much unless it could be used for railroad purposes.

247 On July 18, 1912.

EDGAR H. HOTCHKISS, a witness called by plaintiff.

Direct examination.

By Mr. Eldredge:

I have lived in St. Ignace since 1890. I am cashier of First National Bank; have dealt some in lands there and know value of same. I know the Humphrey lot, 136 x 1,650 feet, and should say it is worth from $150 to $200 per acre; know right of way to Martel Furnace, about 6450 feet in length, 9.78 acres, and value it at $300 to $350 an acre without improvements.

I know dock property owned by Plaintiff, 2,400 feet harbor frontage, and value it at $20 to $25 a foot frontage. I have special knowledge of value, because we sold property of Mackinaw Land Co. there for that purpose to Northern Michigan Railroad Co. for $8,000; I made the sales. That was very much less valuable for dock purposes than plaintiff's dock property. In my opinion, this South Shore property is the most valuable water front in St. Ignace.

I know plaintiff's right of way from its yard, near round house, to the lake front, about 4,200 feet; it runs to the shore, excluding the Martel Furnace line. I should consider $5 or $6 a foot a fair price for it. It would cost $10 a foot to acquire it by purchase or condemnation if railroad was not there.

I know piece of land colored green on Complt.'s Ex. 4, surrounded by red lines, upon which yard, engine house and gravel pit is located; in my judgment, its value is about $400 or $500 an acre. This judgment is based upon my knowledge of sale of a piece of land marked "*e*" on plat, by Mr. Johnson of the Mackinaw Land
248 Co., for $4,000.

HOTCHKISS.

Cross-examination.

By Mr. Wykes:

In fixing an average value of $5 or $6 a foot for right of way running 4,200 feet west from the old slip dock, I took into account that some of these parcels were cut up, and that the owners of some of adjoining property would give more than it is actually worth to get it. The person who owns the back part of a parcel would give more than the front part of it is worth to unite parcel and be on the street. If it were a single parcel of that acreage, I wouldn't put the same price on it; it would depend somewhat upon where it was located. In getting at my valuations, I placed different values upon different parts of it, and then averaged it up; for instance, the lot just north of Truckey St., with a sidetrack running through it off to the coal dock, is a valuable lot, while the lowest values are up north of Maloney St.

In arriving at my figures in the first place, before I knew anything about what this was for, I was asked what I would consider that worth per foot, and I have my estimate. That estimate was based upon my judgment; my judgment was based upon my knowledge of what property in general is held at in St. Ignace, and what in my judgment people would regard the property worth for this purpose to go through it, not putting valuations on the different parcels but just in a general way. In my judgment, if St. Ignace were without this railroad, it would be a dead town.

249 HOTCHKISS.

Redirect examination.

By Mr. Eldredge:

In arriving at my final judgment of $5 a foot, I estimated what that property would bring if the railroad were taken away from there. My judgment is that the property at the west end of this strip would be slower of sale and of less value than the east end, and I averaged the whole distance at $5 per lineal foot.

HOTCHKISS.

Recross-examination.

By Mr. Wykes:

The values of $40 a foot would apply to less than half of the description. I arrived at this (my judgment of value) by estimating the whole tract; I didn't take a piece of paper and put each lot down.

250 On July 18, 1912.

ROSCOE C. YOUNG, a witness called by plaintiff.

Direct examination.

By Mr. Butler:

My age is 48; I live at Marquette. I am Chief Engineer of the Lake Superior & Ishpeming, and Munising, Marquette & Southeastern Railway Companies, which have headquarters at Marquette. These companies haul ore from the iron district.

I began working at civil engineering in June, 1883, as a rodman. I worked from 1883 to 1893, except one year, on the Peninsula Division of C. & N. W., headquarters at Escanaba. From 1893 to 1894, I located for the C. & N. W. in Wisconsin. During 1894, I had charge of a water works plant in Illinois. From 1895 to 1900, I was Chief Engineer, and Chief Engineer and Superintendent, of the Munising Railway, now a part of this system.

During 1900. I worked with the so-called Cooley appraisal. appraising the railroads of Michigan. I had the South Shore, Mar-

quette to the Soo and St. Ignace, the Munising, the Manistique & Lake Superior, and the Manistique Railways, part of the Pere Marquette, from Port Huron north and west, and the Michigan Central, Saginaw to Kalamazoo, via Jackson; also special work at other places. After that appraisal, I worked for the Copper Range, on special work, for two or three months. From the spring of 1901 to 1903, I was Chief Engineer of the Des Moines, Iowa Falls & Northern, in Iowa; and located and built 76 miles. During the next year, I was locating engineer of the Rock Island System, and located 200 miles through Illinois. I came to this road, here in Marquette, in June, 1904, and I have been here since.

Since here, I have located and acquired right of way for
251 and built some railroad; we build some every year. The first year, we built ten miles at our east branch, and the next year, I built 25 miles—our Lake Independence extension. The next year, I built from Little Lake west and the mining tracks around Princeton. Since that time, we built our north main line through Negaunee, and I had charge of the construction of the South Shore change through Negaunee, where they built the new track. Then we extended our line from Ishpeming west to the Barnes mine, about seven and a half miles, in 1910 and 1911. Except about five years, I have been railroading in the Upper Peninsula 29 years.

When I took part in making the examination, for the Cooley appraisal, of the lines of the South Shore Co. east of Marquette, I went over the road on a handcar. I made and reported estimates of the quantities of grading, and classification as between earth and loose rock and solid rock.

Two weeks ago, I went over the lines of D. S. S. & A. west of Marquette, as far as Iron River, Wis., going over all main track in Michigan west of Marquette. I had with me the condensed profile. It gets to be a habit to form opinions as to the yardage in the roads; that is a part of the engineering profession. We are required, in locating, to make approximate estimates of yardage per mile; we get familiar, by looking at a piece of road and profile, with arriving at the approximate quantities. In calculating the yardage to be moved in a railroad to be constructed, the profile is used. It is customary to add percentages and other things deemed necessary to bring the yardage up to what we think it actually will be to include work outside of that actually shown on profile.

252 It is customary to add 10% to cover shrinkage and settlement; it is also customary to add a percentage, and a percentage must be added to cover grading for crossings, channels, surface ditches, drains, roads to barrow pits, etc. An engineer usually forms an established custom, though he departs from it if there is anything extraordinary. Usually, I add 10% for these things, and if there is a lot of swampy ground, or something like that, we add more; this percentage is in addition to that for shinkage and settlement.

On D. S. S. & A., east of Marquette, I would add 10% for shrinkage and 10% for highway crossings and extras, except through the long swamp, Ta-qua-me-non, where it would be necessary to add at least 50%; my recollection is there is 30 miles of it. My experience

justifies 10% for shrinkage and settlement; it is only a safe figure to bring the road to completion at the end of contract period. Even that would not cover the road after operation for a number of years.

Ballasting in swampy places disappears. On Munising railway north of Shingleton, I put three train loads of sand ballast on a similar dump to the one spoken of and two years later hauled two more train loads on to the same embankment; the sand had settled into the embankment. The surface of the embankment on which the ballast rests sometimes settles and distorts out of shape, requiring more and more ballast, as time goes on, to keep the line in shape for operation.

American Railway Engineer and Maintenance of Way Associations' Report, pages 548 to 552 inclusive, for 1907, shows cross-section cut of an established roadway; it indicates a deformation of
253 the original roadway, and that there is 2 or 3 times as much ballast actually in roadway bank as indicated on surface. It is always the case, and more especially in soft roadway; clay roadway is not as liable to deformation as the muck banks I referred to on D. S. S. & A.

The illustration shows how it is necessary to keep restoring the ballast from time to time, and that it is impossible from examination or measurement of a bank to calculate accurately the yardage of grading and ballasting of an existing property. The presence of that amount of ballast is an advantage to the track; the track becomes firmer after the period of years shown. A railroad embankment well maintained appreciates; the reason is that when the road is built it settles and it is necessary to employ a larger number of section men to keep track in good operating shape, and the shoulders of an embankment wash down, and it is necessary to haul more material on for shoulders, until banks and cuts are grown over with vegetation, so they stay practically the same.

Growth of vegetation on slopes adds to value of the property; it gets in fair shape in 5 or 6 years; after 10 years it is practically permanent, after which it usually requires no more work. On our line, M. & S. E., Marquette to Lawson, 10 years old, I was obliged last year to widen all of the shoulders, to get in shape to hold ballast; on that track, though 10 years old, the cuts have not become sodded over like D. S. S. & A. Construction, or added maintenance, continues a number of years after the road is open to use; it is necessary to keep doing work on it a number of years, which is not usually considered in line of maintenance work.

For 1911 or 1912, in my opinion, fair unit price for grad-
254 ing to reconstruct lines of D. S. S. & A., taking everything into consideration, would be 30¢ for earth. You would have to pay contractors the price for that length of line.

For ties, as a whole, I always figure 55% condition as their limit. After the road gets to a renewal basis, the ties are usually 55%; they are still in 100% efficiency. If ties last 10 years, 10% must be substituted by new ties each year. When the old tie is taken out there is a new one to put in its place; you have them both on hand, which

is the reason it is 55% instead of 50%. You are using the old tie, but still have the new one which has been charged to the work.

Usually 3,000 ties per mile of main line are put in first class track; South Shore main line and mine tracks have 3,000. A cedar tie will last 12 to 15 years; hemlock or tamarack 6 to 8 years. We have been putting date nails in our ties for 12 years; have kept a record of every tie that has come out, and had that compiled, so we know how long they last. In 3 or 4 years we make a statement of averages; that is done so we know what ties to buy.

Last year we paid 38¢ for cedar ties along the track; it costs us 2¢ to load on cars, and we figure inspection at 1¢; I should say on the South Shore 3¢ a tie would be the minimum for freight charges, 2¢ for loading and unloading, and 1¢ for inspection; that would make 44¢.

It costs probably half a cent more apiece to load hemlock and tamarack ties, as they are heavier. 38¢ is the price we pay small jobbers, delivered alongside our tracks. Ties sold for more money last year by the larger shippers; we buy ties considerably cheaper to
255 take them from farmers and the like along the track. There are dealers along the Munising Railroad that we cannot buy ties of, as they get more for their ties in Chicago then we can afford to pay. It costs more to load ties picked up along the main track, as we must have the services of a tie train all the time. The hemlock, tamarack and black ash ties would be a half cent more for the extras and the tie charge is 30¢, making 36.5¢. For culls or number two ties, I paid, last year and this: cedar 22¢, and hemlock 18¢; loading and transportation, 6¢ extra. This is ties taken on regular inspection; taken out of regular inspection, we paid: cedar, 15¢ and hemlock 10¢. Material is getting scarcer and harder to get. The high prices of two years ago have not been reached since, but we do not get the low price we did 10 years ago; the tendency is upward.

I estimate track laying at $528 a mile. I am generally low; it generally costs a little more than I estimate. There are other contingencies and things which make it cost more. I think it usually costs 20% more than my estimate.

It is customary to add for engineering services in constructing a railroad. The recognized percentage varies somewhat; my experience is that 4% is about right, applied to the construction items, not including rolling stock.

It is necessary to allow interest during construction, the allowance depending on the time and rate; the time is an estimated factor. To reconstruct plaintiff's lines, including location and acquiring right of way, would take about 4 years; the location ought to be made in a year. The chances are, the right of way would not all be
256 acquired until construction was completed. I think a year for preliminary and three years for construction.

The bulk of right of way would usually be paid for before grading is commenced. The interest should be computed for half the time for construction—2 years. Our custom is one-half the period at the full rate; I think that about right. 5% is customary, and our calculations are based on 5%. The rate depends on the credit of the

owner. I am always instructed by the management what rate to figure.

Our company has good credit and strong associations. I think its credit the best. The Lake Shore & Ishpeming are now building an ore dock near Presque Isle. I estimated the interest at 6%. They told us that conditions are different, and the bond rate would be higher. It is now on the second year, and I have over-run almost 25% on it. My interest estimate was $36,614; on June 1st, we had spent $42,030. We won't begin partial operation until Aug. 1st, 1913. My experience is, if you get any earnings due to operation during construction, they hardly come up to cost of operations. Such operation is a nuisance; it interferes with construction, and makes it cost more. My opinion is there would be no net revenue during construction to be offset against interest.

While I think the road when built, Soo to Marquette, could be operated at a profit while the rest was being constructed, I don't think they would finish a piece of road like that; they would not get it done in three years if they did. They would have to start it all at the same time; if they started to build from here to the Soo, and did not start the other work, it would take more than that time to build it. Piecemeal construction would take more time and money.

257 In estimates of cost of railroad construction, it is customary to include, over and above all items of material and labor that can be specifically enumerated, a percentage for contingencies. So far as my experience goes, 10% is customary for all construction items until the ballasting is finished. I am not as familiar with rolling stock, and do not think the percentage as high. On 5 engines recently bought, the overhead cost, including freight, inspection, etc., was 3%.

My custom is to add to all the different items going to make up the estimate, usually, 10% for contingencies, and afterward I add another 10% for contingencies to the whole estimate; we always needed it before we got through. I always figure that if I come within 10%, one way or the other, I am near enough. I sometimes overrun 10% and sometimes underrun 10%, but have concluded that that is a fair method. If I understand correctly, Mr. Riggs' percentage for contingencies in Complt.'s Ex. 1, Riggs, page 292, includes a percentage for engineering.

I don't think the average of 7.9% high enough for contingencies. On some items, such as ties and track fastenings, 5% is allowed; I do not think the average is high enough. It ought to be 10% on both ties and track fastenings. I do not see anything else on page 292 but what looks all right. The right of way items might be a little low; it is hard to estimate. I have never been able to make an estimate on that.

The estimates and experience referred to in my testimony relate principally to work on the L. S. & I., M. & S. E. and Munising Railroads, about 160 miles of main track and 50% other track. The prices have been varying, usually advancing. I have had to do with acquiring right of way, involving acquisition through

258 rural, timber, second growth and agricultural lands, in northern Michigan and Iowa.

I am familiar with lands through which South Shore runs. I am able to give my opinion of relation of cost per acre of right of way lands as compared with value for other purposes in rural districts; eliminating mineral lands, the average relation is 3 to 1. You get extremes both ways; sometimes you pay about the actual land value, and again, somebody holds you up to more than 3 times the value. On a piece of land 25 miles northwest of Marquette, acquired 7 years ago, prices, aside from cost of procuring, ran $15 to $170 per acre, through practically the same kind of land. That land varied from sandy loam to heavy soil. The timber conditions were about the same as on South Shore, some second growth, virgin timber and rocky lands.

On recent trip over South Shore, I noted character of land in Gogebic, Ontonagon, Houghton and Baraga Counties. I have never been able to buy right of way at less than 3 times what I considered the fair value of the land.

In my opinion the multiplier to be applied to market value of land, Nestoria to State line, is at least 3. That applies generally, I think. People I have had to deal with objected strenuously to a railroad across their property. This would apply to all the lands of the company west of Marquette. I have a good deal of experience in getting right of way in Marquette County.

I do not think you would be able to buy any land without mineral reservation. The principal area containing deposits of iron is from

259 west boundary of Marquette County to near Eagle Mills, 8 miles west. Prospecting there to Marquette has never shown anything. In past few years we are not able to get right of way in Upper Peninsula without mineral reservations and removal clauses that read "by removal at railroad's expense if minerals are found under tracks." We have to accept that kind of grants. We cannot afford to pay for suspicion of mineral under right of way. The tracks of my company, the South Shore and the C. & N. W. are indicated on Complt.'s Ex. 8, Riggs.

I have recently procured right of way in territory embraced in this map, in section 5-47-26; this was for South Shore, where I had charge of construction. I procured three-quarters of a mile to a mile of the 2.6 miles right of way now used by South Shore. I acquired this right of way and built for plaintiff, as Cleveland Cliff Iron Co., which controls L. S. & I., owns mines each side of old South Shore main line. The South Shore had permanent right of maintenance contract on their old line, which could not be enjoyed consistently with the mining under the track and for some distance away. As they mine the ore, they hold up the surface temporarily; when they are through mining that part of the mine, they let the surface cave in. It would be too expensive to reconstruct the track afterwards, and you cannot tell when it is liable to cave.

The owners of the surface do not think it best to mine the ore and hold up the surface; that would be prohibitive of the mining. About a mile and three-quarters of the South Shore was abandoned,

and in locating a substitute road 2.6 miles was built. The new location is not subject to removal clause; the Cleveland Cliffs gave a bond to certain land owners for any iron ore that might be tied up on account of construction of the new road.

260 The mining, even if not under the right of way, is likely to disturb the railroad. They figure a slope of about 60 degrees, 1,000 feet depth, is liable to pull 700 feet, and 500 feet to pull 400 feet away.

The right of way I procured, about 15 acres, cost $5,000 an acre in addition to the bond. The Cleveland Cliffs employed the L. S. & I. to construct this line, and owned an interest in the company which owned part of the right of way; the price was made by other interests. I think $5,000 was too much, but we were not able to get it for any less.

The cost of construction of a single track of the new road was a little over $80,000, and the right of way about $102,000. The Cleveland Cliffs and Oliver Iron Companies paid the cost. It was necessary to build more line than the abandoned right of way in miles; the line is not less than 100 feet wide—a little more, part of the way.

The price for the right of way throughout would be about $3,500 per acre. Only a portion of the abandoned right of way was underlayed with ore. More ore is tied up than is under the 100 feet. It might be 500 to 700 feet each side of the track. We also built, in 1911, a track to Negaunee Mine, nearly parallel to and north of the above track, across sections 5 and 32; it is marked L. S. & I. Railway. The deed has usual removal clause.

I procured right of way to Negaunee Mine, number 3 shaft, through section 33, S. E. ¼ of section 32-48-26; and N. W. ¼ of section 5-47-26, in 1911. Right of way across N. W. corner of section 5, from Pioneer and Arctic Mining company surface

261 rights with removal clauses, cost $1,350 an acre; we condemned the S. ½ of S. E. ¼ of section 32, and N. W. ¼ of S. W. ¼ of section 33, getting the same rights as by deed-removal clause and waiver of mineral rights.

The N. W. ¼ of S. W. ¼ of section 33 cost $1,111 an acre, not including court costs. The other parcel, with three owners, cost $3,059 an acre, being .85 of an acre at $2,600, .21 of an acre at $2,381 per acre, and .64 of an acre at $2,344 per acre; it cost $1,100 to $3,000 per acre for right of way subject to removal clause. I know that land would not sell for $1,000 an acre if platted.

I am familiar with right of way of South Shore, mile posts 163 to 164 plus. It is practically the same as east end of new line; it crosses same parcel as this $1,111 an acre piece that I have in here. Except for permanency of right of way, the cost of right of way of new line and for line to Negaunee mine would be about equal. The question of permanency or existence of removal clause bears substantially on cost, because nobody knows whether there is any ore there or not.

Am familiar with south line, mile posts 9 to 12; it would average about the same as new. The west end of the south line is right in

among the mines. Do not think right of way quite as valuable on south line as on north line.

We bought another little piece on section 7-47-26, with right to maintain one track for about a quarter of a mile, 1.10 acres, in 1909 or 1910, and paid $5,700 an acre, to build a track to another mine. The $700 was to a tenant for moving a building back. We had removal clause. The South Shore goes right alongside this.

262 Conditions are the same three-quarters of the way through section 18 to within a quarter of a mile of the south line; that is the Palmer or Volunteer branch.

It would be impossible to get perpetual rights at any reasonable expense. In my opinion, you could not procure right of way of Palmer branch with right to perpetually maintain track except by condemnation proceedings. The only thing I have to guide me as to the cost is what was done around Negaunee; I think it would cost $2,000 an acre with the removal clause.

I think fair cost to reproduce Palmer branch right of way subject to track removal $2,000 per acre. I do not think any sane man would go in there and estimate it at that unless he had had some experience in it. Don't think right of way to Mary Charlotte mine, 3.2 acres, would cost quite as much; not more than 40% or 50%—about $2,000 an acre.

I have procured right of way through west end of Negaunee from center of S. W. ¼ of section 31-48-26, down through section 1-47-27, connection with L. S. & I. old main line in S. E. ¼ of section 2, in 1909. It is heavy work, and width is more than 25 feet average. We have 50 feet all the way except part of section 31; on the S. W. ¼ of S. W. ¼ of section 31, and N. W. ¼ of N. W. ¼ of section 6, we have 400 feet; we bought it as lots. Where we bought unplatted part in section 1 by the acre, we paid $1,000 an acre. It belonged to same people our road belonged to. Right of way bought at that time contains 4,603 feet of track to west line of section 1, and cost $45,288.45, making $9.84 a foot.

Another description, of 1.73 acres, cost $7,000, or $4,080 an acre. Adding that 760 feet, would make 5,363 feet, at $9.80 a foot.

263 The 760 feet of 1.73 acres was acquired by condemnation, and took entire surface; the owner did not own the minerals. There is some question whether it included any right to sustain the surface. Owner was Samuel Collins, and description the W. ¼ of S. W. ¼ of S. W. ¼ of section 31-48-26. I think they got too much. They claim value to be there on account of platting purposes. You would be surprised if you could see the prices that we had to pay for lots there; I would not have believed it myself.

The value of that parcel, as compared with reproduction cost of right of way of South Shore through Negaunee, is a good deal less. You could not buy right of way through where South Shore Negaunee station is. The parcel above described cost $9.80 per foot for trackage rights. Strategically, South Shore is in a great deal better position than this new line; it is right in the center of the business part of town, and this is on the outskirts. It cost us $258,000 to

build that piece of track through there that we would not have been obliged to pay had we had a perpetual right of way on other line.

I have acquired other right of way through this same point, or through between Ishpeming and Negaunee from west side of the platted portion of Negaunee to west city limits; we got just width enough to lay our track, at $1.55 a running foot, for 3,305 feet. There is removal obligation there.

Comparing rights described with those of South Shore, alongside, I feel hardly competent to make comparison; we are only tenants at will. Width occupied by South Shore is in some places greater than ours, and would average 1½ as much. For north track, my
264 experience in procuring this last job of right of way would be a fair guide to fair cost of reproduction, except their rights are a little better than ours.

We made 2 or 3 condemnations in Ishpeming, and all looked ridiculous to me. There is a little house on a triangular lot where we crossed South Shore track; we took off a triangular piece of the lot, about 50 feet on one side and 40 on the other, which did not involve any difference in the lot, and question of the proximity of railroad did not cut any figure, because South Shore ran right behind the land. The jury allowed her $2,000 for cutting off point of that lot.

Another place in Ishpeming, where Pine St. crosses L. S. & I., we acquired a license, subject to redemption if needed for mining purposes, of 1.15 acres, for building track, costing $787.58; re removed rock, at cost of $1,181.50, and in addition moved a lot of houses and things which cost us, with the removal of a city water main and the building of another street, probably $2,500.

I procured right of way for extension to North Lake mine, 4.3 miles. We paid owners a thousand an acre for surface rights and tenants $50 an acre for theirs, from west line of section 10, in Ishpeming, to city limits. Tenants had cleared ground and had it under cultivation. From that point to North Lake, Excelsior Iron Co. owned all but one description. We paid tenants from $48 to $75 an acre for their clearing and cultivation, and $100 an acre to the owners, plus attorney's fees.

On one piece, in section 5, to get 3 acres we were obliged to take 5, for which we paid $1,000. We were building to the Excel-
265 sior Mining Co., and $1,000 an acre was paid to it for its lands; that company is owned by Cleveland Cliffs, which owns a majority interest of L. S. & I.; 60% ownership of railroad company and mines were identical. The president of the L. S. & I. is president of Cleveland Cliffs and has quite a voice in the matter in both cases. His contention is that their company should get what other people get and accept for their rights.

We have been able to get right of way from Cleveland Cliffs at a little less in every case than through outsiders; think it is all too high, but we cannot get it cheaper. For comparison, we paid the Cleveland Cliffs $1,000 an acre for the N. E. ¼ of N. E. ¼ of section 1, and in condemnation $4,080 an acre to an outsider for parcel in S. W. ¼ of section 31. Cleveland Cliffs parcel was nearest to town and worth more per acre. I offered Collins $1,000 an acre, rather

than go into condemnation. Conditions in Ishpeming and Negaunee are just as good today for getting right of way as they ever will be, and I think better.

If railroad was out of there, and that 25 feet owned by those who owned the abutting lands, there would be an element of damages on account of injury to property and lands not taken. It would cost $50 to $75 a running foot to get that right of way through there, perhaps more; I mean that is just the value of the property. If lots and blocks covered land now occupied by South Shore, chances are you would have to pay damages amounting to another $50.

By reference to Complt.'s Ex. 6, Riggs, (Marquette) lot 1 was acquired by condemnation, for freight house grounds, on Lake Street. There is 500 feet on Lake St. at foot of bluff, below Ridge street; it runs back 145 to 163 feet, contains 1.7 acres and cost $14,10).

266 It had no water rights; was part on hillside,, with 6 owners. Probably half of it was useful. There were 3 or 4 houses, which we gave away for tearing them down.

We bought the site of our present depot, corner Washington and Lake Sts. in Marquette, 4 years ago, 2.34 acres; .67 of an acre on hillside, and 1.57 acres good ground. We paid $50,000, and worked over the old shells of buildings into our offices. We called the buildings worth $25,000 and the land $25,000.

A couple of years ago, we paid for trackage rights near Hampton St. There was a lot 40 feet front on Lake St.; we paid $250 for abutting damages for building on opposite side of street. Ten years ago, we bought lot 1 in Edwards' Add., between Garden and Mesnard Sts., 200 feet by 446 one side and 504 the other. It had an old stone house of no particular use on it, and cost $8,500 plus some taxes. By the Chocolay River, 300 or 400 feet from South Shore road, we paid $1,000 for .9 of an acre, for right of way. There was a house on the front part of lot.

267 YOUNG.

Cross-examination.

By Mr. Wykes:

I was connected with 1900 Michigan appraisal, and testified in 1902 appraisal. For 1900 appraisal, I made inspection of railroads in both Upper and Lower Peninsulas to determine grading, ballasting, etc., going over the road on a hand car, making 35 to 50 miles a day, except where there were a lot of buildings, bridges or sidings.

The recent inspection of D. S. S. & A. was from back end of a private car on special train. We spent two days on the line west of Marquette. Train was moving most of the time; we stopped and examined a few bridges and a few buildings, but did not stop to examine quantities of earth work. From character of inspection, there would be liable to be some variation from figures obtained for quantities of earth work. Nobody can look over a piece of road and absolutely assert that there are so many yards, and no more or less.

I considered judgment I gave conservative. It may not be ab-

solutely correct. Without measurements of cuts, fills, slopes and heights, it is a guess. The best way is to estimate from the profile and add proper percentages; I didn't attempt to make an estimate, except to give judgment on an estimate I made for the purpose of checking. On an inspection of the character I made, there might be a variation of 20% to 30% on the actual yardage. Same thing would not apply to the rock. I am satisfied that this would be much more than the figures I gave. I would not be surprised if there was three times as much. The variation of my figures from actual solid rock might be from 20% to 40%. I think variation would be over; I don't think there could be any variation under.

Shrinkage is the earth moved necessary to put into a fill over what you can measure in a cut. It is always necessary to put more earth in an embankment than you can find in the cut. An
268 engineer putting shrinkage on embankment always sets his grade stakes a certain percentage higher than his actual grade. You cannot set your grade stakes 10% above grade you want, because it might not shrink that 10% before you got ready to lay track. You have got to take care of shrinkage sometimes in extra widths—putting it on the side of the embankment. To each original estimate of yardage, after estimating profile as near as I can, I add 10% to all quantities, to take care of shrinkage and embankments, the extra yardage and cuts due to the side hill slopes and surface ditches and such things. Measurement and payment for earth quantities is on earth in place in the cut, which is packed earth.

The contractor is paid a place measurement on excavation. In making estimates from the profile, the fill embankment nearly always overruns the excavation. In order to get whole estimate you must take embankment estimate for your figures, or cross-section all cuts before you make your estimate; therefore, figures you get estimating your profile are embankment rather than excavation figures. You add the 10% to take care of excavation figures, such as contractor is paid upon. Figuring for purposes of payment, you figure directly upon cut, while, figuring for purposes of appraisal, you figure on the fills. If the cut happens to exceed the fills, then the cut estimate would be taken, rather than the fill. It gets back to the question of whether, in estimating the profiles, estimate was made on the fill quantities or on the cuts.

Overhaul is the distance beyond free hauls; the contractor, for a stipulated price, agrees to haul material for 500 feet; for every hundred feet past that he gets a certain price per hundred feet for hauling. In this territory, 500 to 1,000 feet is the free haul. It de-
pends on character of work and kind of equipment: if done
269 with wheel scrapers, we usually make the free haul 500 feet. If better to use tram cars and track, then it is 1,000 feet. The 30¢ price would cover either 500 or 1,000 feet. For overhaul, the usual price is 1½¢ per 100 feet per yard. I have known it to be 2¢, and to be 1¢. I have known, and let, quite a number of small contracts at 1¢. In making an appraisal, if you are going to get at cost of the property, overhaul is to be put in. I would not include

that item in contingencies; it is not difficult to get at, if you have the profile to work from. When the contractor is paid, you have actual, instead of estimated quantities. If you had sufficient data to get at price of overhaul in any other way, it should not be included in contingencies.

Contingencies is to cover those things you cannot get at. The question of whether things of that kind were or were not included in contingencies would affect rate that should be added for them.

In the place near Taquamenon swamp which I described, speaking of filling and putting on extra trains of sand, I would not put it under contingencies; I would add that percentage to earth work when I was making the estimate. If I found that profiles show 5,000 yards to the mile, in making my pre*mil*inary estimate, I would say that it would take 10,000 yards, if I knew that swamp was there; and I would know, because we always know what kind of land we are going over. I suppose for inspection of completed road it might come into contingencies, but it would have to be a larger contingency than we have ever used to cover it. I do not think that it ought to go into the contingency. An engineer with judgment enough to know would cover it in its yardage by a percentage, in the first place. The company's records might show the yardage now, but would not in the old days.

270–1 I intended to add a percentage for shrinkage, and then another percentage covering what I mentioned in the way of ditches, road crossings, etc., that are not usually taken in. I did not add any more percentages, but said that in the case of a large swamp 10% wouldn't be nearly enough; it would there take nearer 50% for shrinkage, which I would add as a percentage to the quantities. That applies to a swamp. A sink hole is a depression grown over with vegetation. The weight breaks through this crust and you must fill in the hole. The amounts required for sink holes would have to be included in the estimate, which would be difficult.

My experience is that, after you have gotten at everything as best you can, then you must add a percentage for contingencies to take care of things you cannot find.

A surface ditch is sometimes placed on the edge of the right of way, to keep the water from coming into the cut, or seeping through the sides; it drains the top of the cut, and is put in, either at the time of original construction or afterwards, by section men, when needed. Crossing fills are made for all existing crossings at time of construction, before the road is turned over by the contractor.

The first two or three years the roadbed is settling, and the work done on it goes into permanent construction and becomes an asset to the road itself. You must have extra section men during this time, as well as extra work trains and extra work in the engineering departments. On our road, if we can do this work with regular section men, we charge it to operation, otherwise to capital. Section labor always goes into operation. Our road and the Northwestern generally make authorizations and put on extra trains and gangs to do this work. It is then charged to capital.

272 I am not sure that all railroads charge the work in parts of roadbed during first few years which I stated was construction rather than maintenance, to capital; as long as it goes to betterment of railroad, it is an asset and an added value to the road, whether charged to capital or maintenance. In my experience, a road, if properly kept up, becomes easier and less expensive to maintain with age.

In one case, where we purchased 5 locomotives, shop inspection and freight amounted to 2%, charged to the locomotives; when a new locomotive took the place of these, there would be a new engineering charge on the new locomotives.

South Shore uses a 7 inch standard tie; ours is a 6 inch. We paid 38¢ alongside our track for 6 inch standard cedar ties. We do not want to buy any, so we put our price very low; 23¢ on hemlock and tamarack, to 19¢ for culls, is the price posted for 1912. Last year, I paid 30¢ for hemlock, and the same for cedar. I bought tamarack or hemlock ties, that seller would rather we would take than bother with shipment of less than car load, at 23¢; a few they could not get rid of any other way. We paid 37¢ for hemlock and 47¢ for cedar, to Northwestern, where we have joint maintenance on tracks, or in exchange of tracks, and charged the same price to them; then they charge 15% for freight, counting and handling.

I figured my ties at 55% of their value new, where renewals are sufficient to keep up the depreciation within the life of the tie, where in normal state of preservation. I figured there is one tie in the track good for a year and one practically new; you average a tie that is good for one year and tie that is good for 10 years, and it will give you 5½, or 55%. I figured there is no tie in the track not good for a year. We always have a factor of safety on ties, the new tie

273 is on the ground and has been charged to the track, or if you take it after it is in, the last tie is good for 10 years and the first one good for one, making an average of 55% in either case. That is when track is in normal condition and ties are running to their limit; if the life of the tie were 9 years and renewals on the basis of 11, they would be run two years beyond their safety point, and they would not be at 50%. The fact that the average life of a tie might be 9 years and you left it in the track 11 years would not mean that they were two years beyond safety point, because there is a very great variation in the life of ties; some will last double what another of the same kind will.

The average life of a cedar tie is 12 years, but some will last 25, and some must be taken out in 7; average life of hemlock and tamarack is 6 to 8. I would not say it was possible for condition of ties, in a main track being used, to go below 50% with safety. Ties with average life of 9 years might in a certain piece of track run 11; it depends on nature of soil. We take them out on inspection. On a straight line, you can allow a tie to run a little longer than on a curve. Section foreman makes his inspection, by going over with a pick, testing ties to see whether rotten, and estimates number of ties to be put in, after which roadmaster goes over and checks him up; road master walks over the road, usually, or goes on a hand car where he can see it, but that is only to get at the estimtae of ties needed that

year. Sometimes a road would stand 2 years without ties; I have seen that done without renewals, when they think they are keeping it up in normal state.

I do not remember just what my grading price on South Shore cutoff figured out at; I don't remember that I ever figured it. My estimate was 30¢ and it ran very close to that. I don't think I ever furnished South Shore or Mr. Riggs with actual yardage; Mr. Riggs' approximation was estimated yardage. I might have furnished correct tally, but do not think so; I furnished a profile with
274 estimated yardage on it to South Shore. The total cost included everything, including rock, that went to make the expense of the work. I don't remember that rock was separated from the other work in my preliminary estimate; my 30¢ did not cover rock work. I had two contractors figure on that work before it was done, and one made a price of 27¢ or 28¢ and another of 33¢. I don't know what accounted for the difference between them; the higher one was a little afraid of the sink hole, and the other man's outfit was a little closer by.

In past few years, our company has done grading at less than 30¢; on the short spur west of Ishpeming we let part of it by contract to a small contractor for 24¢. We did the heavy part of it ourselves, that being a steam shovel job, and a long-haul—about a half mile—for 30¢; it was all fill, to build an overhead crossing in Ishpeming. The question of overhaul not so material in steam shovel work; on South Shore cutoff, nearly all the work would have been more than the earth price due to overhaul. So that method—paymen' for overhaul—would have cost more than 60¢, instead of 30¢. If material were there to borrow, it would be impossible for an overhaul charge which reached or went beyond the contract price for moving earth, due to fact that when overhaul becomes too great you borrow from other pits.

On a careful inventory, it is impossible to see and get everything. The percentage for contingencies should not be below 10; unless proper care is used, more than that is probably needed. Contingencies is for items not anticipated in construction. After road is completed, some of those items have become visible, and are capable of inventory, but the larger part of them are not; if I were able to sit here and list the items, they would not be contingencies. The theory of the contingency is that the items are there and have to be paid for.

275 Lowest price we paid for right of way in Ishpeming and Negaunee district was, Ishpeming to North Lake, $100 an acre for right of way and $50 for settlement with tenants; that is west to our North Lake mines.

YOUNG.

Redirect examination.

By Mr. Butler:

A comparatively high proportion of South Shore mileage in Michigan is tangent or straight line. The high rail on the curve wears

off on the guage side only; very little wear is on the top of the ball of the rail. The inner rail wears on the top only. (The witness produced a chart—Complt.'s Ex. 18, Young—showing the different way- rail would wear in different places.) On a tangent, with the same amount of service, rails would show very little wear. The outer rail of a curve is worn off much more than the inner. The outer rail is worn on guage side, in some cases, enough to make it necessary to remove it. The outside rail on a curve may be placed on inside, and inside rail on outside; when so transferred, the rail does not wear as rapidly as a new one would in the same place, but will last as long, or longer, on account of its having been cold rolled with the traffic.

Rail removal from main line track or curve is excellent for less important lines, putting the unworn side toward the guage side, and the worn side out.

YOUNG.

Recross-examination.

By Mr. Wykes:

My testimony with regard to rail wear and use of rail on curves is dependent partially on study of experience on B. & O.,
276 though I recently made some study on it myself and calipered some rails. The traffic on the L. S. & I. is very heavy in freight. Our rail wear is heavy on curves, but not on straight line; we have about 50% of curves, which is a high percentage. Our traffic is ore, in full trains when they can get it; very often they run with light trains. I am not able to tell what one train does wear the track, and it would be impossible to know what wear is due to one character of traffic, and what to the other. Weight and character of the cars, and whether curve is on grade or level track, are factors. The curves wear more rapidly than the tangents; that a curve occurs on a grade makes no difference in wear, but it does in the resistance to pulling power of locomotive. I don't think a locomotive drawing a heavy train wears the track more than a light one; it is the engine that wears the rail, more than the cars. The power of the train comes from contact of engine wheels with top of rail, and not with the guage side of the rail, which does not wear unless the engine slips.

Wear of rail or fastenings, or depreciation of ties due to derailments, is a considerable item during construction; I mention it as a contingency of construction. It would also exist more or less in operation. There would be less derailment of passenger trains than of freight, on account of the greater care in inspection. I did not notice any rail on curve on South Shore, on inspection trip, that was worn very badly.

On January 7, 1914.

YOUNG, recalled by Plaintiff.

Direct examination.

By Mr. Eldredge:

I know the south yard of the South Shore in Marquette, and have seen Complt.'s Ex. 1c, Riggs, Parcels 6, 7, 11 and part each of 12, 13, 14, and 16 (Marquette County), totaling 18.85 acres, are included in that yard. In figuring the area of the yard, I in-
277 cluded streets used, making altogether 25 acres. In my judgment, this yard has a special adaptation for railroad purposes.

Mr. Wykes: Just a moment before you answer, I wish to object to it as immaterial and incompetent and not the proper way to fix the value of a large tract of land which in acquiring must be acquired in individual parcels; that is, if the problem be to acquire, it must be taken in individual parcels and not as a whole, and it is not the value to the railroad company, and this method is a method which seeks to get the value to the railroad company.

That value may be arrived at by considering it in comparison with the next best parcel of land of proper size for the same purpose, comparing the cost of purchase, construction and operation of yards on both parcels. There is no other site as well adapted for a yard, both in point of cost of construction or in economy of operation, as the south yard.

The next available site is the ore yard, just west of the present shops and roundhouse. It would comprise two strips of land, one 230 feet wide by 1,600 feet long, parallel to and 50 feet north of the center of the present main track, and the other, 456 feet wide and 1,600 feet long, parallel to and 15 feet south of the center line of the present main track, beginning at the western boundary of the south half of the northeast quarter of Sec. 22, 48-25, and extending easterly 1,600 feet—25 acres, the same area as the south yard. I made an estimate of comparative cost, assuming the building of the track to be the same, the only difference being in grading for the tracks. The difference in the cost of grading is $48,735. I assumed the track material, laying and ballasting to be the same on the new yard as on the old. I assumed that, if this yard had been built in some other place, it would have been built under the same conditions it is in now—piece-meal, as they needed it—and that the conditions of building the yard would be practically the same in one place as in the other.

278 The substitute yard would cost much more for operation. I made conservative figures on the cost. The first item of additional cost is handling coal—130,000 tons handled last year. It would be necessary to handle all the coal the additional distance to the new yard at a yearly cost of $803, which, capitalized at 5%, makes the additional value $16,060. The west bound freight trains yearly

cost $1,003, which makes a total cost of $20,075, and the freight trains east of Marquette, both east and west bound, cost $1,204 annually, capitalized making $24,090. I figure the coal two and a quarter miles, and the freight business one mile, both east and west, extra haul. All freight coming into the alternate yard stopped there; there would be no extra haul. The west bound freight from Marquette would have to be hauled around by the south line, an additional haul, and both east and west bound freights east of Marquette would have an additional haul.

I included in this estimate the cost of train operation only. There is a legitimate expenditure for replacement of cars and maintenance of track, which would bring the actual cost, in my judgment, much above the figures named; that has not been included. The total difference between the cost of construction and operation of the two yards would be $108,960, according to my estimate, which would in my judgment represent the value of the special adaptation of this yard for railroad purposes. If the value of the land in the substitute yard and in the present south yard were the same, then this $108,960 would represent, in my judgment, the special value of the south yard.

I know the value of the south yard land is more than in the substitute yard. In my judgment, to arrive at the true special value of this land by reason of special adaptation to railroad purposes, it will be necessary to determine the market value for other purposes of the two sites, and, if the value was greater in the present than in
279 the substitute yard, deduct the difference from this total of $108,960.

The 130,000 tons of coal represents the haulage of coal to Negaunee or points west, taken from the South Shore dockage. I figured the item of expense on other freight on five west bound trains from Marquette, and three trains each way east of Marquette, making six trains east of Marquette daily for the year, including Sundays. I got my information from the Chief Train Dispatcher. This substitute yard is located on both sides of the main line, and would need no new track, except the yard itself. I would not put it on one side, on account of being more economical to grade it on both sides, and because the objections to having it on both sides of the main line appear in the south yard as well.

YOUNG.

Recross-examination.

By Mr. Wykes:

The substitute yard could be located on one side, and reduce the expense of operation somewhat, but not reduce any expenses of operation to which I have testified. It is an inconvenience to have your main line running through your yard. The amount it increases the yard expenses depends on the amount of through traffic. The east end of the substitute yard would be 4,400 feet from Front St. Part of it is on description 33, Complt.'s Ex. 6*a*, Riggs. It begins west at the boundary of description 33, and runs 1,300 feet east. It takes in

lands already owned by the railway company, except so much of it as falls on a piece north of the track, 528 feet long by 345 feet wide.

The coal on which I figure an extra cost is only that hauled through to Negaunee and beyond. I figure the extra cost due to having to take the coal from the unloading point up into this yard and then haul it back the distance it must be hauled back to get it onto the west bound track. Coal goes to Ishpeming and Negaunee over the south line. A maximum of ten large cars can be hauled up the hill. There is not room in the yards adjacent to the coal dock, aside from the south yard, to switch and get together a train of that size. That coal plant is used by the L. S. & I. and the South Shore, and there is no room for storage of cars there. The L. S. & I. brings its cars down from the yard and leaves them on the passenger track when it is not used by passenger trains. We make up all our trains at the west yard, after the coal is loaded. I assume that the coal would be taken to this other yard.

280

There is an extensive yard now, east of this point, used for storage and sorting of loaded ore after it is weighed. If arranging a new yard at this point, they would arrange it so as to best handle the traffic. If they could handle the ore farther west and the coal farther east to the same advantage, that would be done. That would make an extra haul on the ore cars, instead of the coal. The ore cars all take the south line out.

The figures given are minimum costs. It is an approximation, in which I have attempted to be conservative. I did not go into close fractions of miles, but took half a mile as the distance, when it was actually a little more. I used five per cent, because my experience is that that is a low figure for capitalization of railroad properties now. At six, I get a lower value, and at seven a still lower value. I use five per cent, because I thought it a fair average for capitalization. I don't attempt to say the money could be gotten for that. It is a value that we use entirely in leasing railroad tracks around here.

281

I figured my extra distance for west bound freight from the freight house to the new yard. The through freight coming from the east would have to be taken to this new yard and back again. The distance would be longer than I have used. I treated it all as local freight. I do not think any freight on the South Shore goes through Marquette without breaking trains.

On February 12, 1914.

YOUNG, called by Plaintiff.

Direct examination.

By Mr. Eldredge:

I have given some study to the question of apportionment of M. of W. & S. expenses between the passenger and freight service. It is impossible to actually divide the causes of these expenditures in a great many cases between the different classes of service, and, consequently,

it is necessary to adopt some arbitrary method, based on the proportion of the use of the causes of these expenses. In my judgment, dividing these on the revenue train mileage is the only fair basis.

As civil engineer, I have had charge of maintenance of way and structures for a great many years. In the course of my employment, I have had to consider the extent to which the two classes of service, freight and passenger, tended to cause the expenditures necessary for maintenance of way and structures. I have to review all the accounts every year, make annual reports of all the expenses in my department and explain the causes of their increase or decrease. That would not specially involve discriminating between the wear and tear caused by freight service and that caused by passenger service, except it does have to do with the wear and tear caused by trains, as units, and their relative weight and speed. Considering them as units, and their
282 weight and speed, would cause discrimination between freight and passenger. I would except from the revenue train mileage basis but three items of the I. C. C. classification of maintenance of way accounts; i. e., docks and wharves, maintenance of joint tracks, yards and other facilities, debit, and the same item, credit.

As to the buildings, fixtures and grounds, a part of those could be allocated between the different classes of service, but the unallocated parts are, in my judgment, properly divided on revenue mileage basis. In maintenance of way and structures accounts, certain elements of expense are not attributable to train movement, but to the action of the elements; those are; part of the ballast, a percentage of tie renewals, and quite a large percentage of bridges, trestles and culverts and over and undergrade crossings.

The whole of the item of over and under grade crossings would be due to the action of the elements, as would fences, cattle guards and signs, snow and sand fences and snowsheds, telegraph and telephone lines, and buildings, fixtures and grounds. I adopt the revenue train mile basis for the division of expenses due entirely to the elements, as it seems to me that the train mile is the unit of service into which the traffic is divided, and as that unit has more of the elements of the cause of these expenditures than any other way of division could have. The cleaning of roadway is done for two reasons, the primary reason being protection from fire, and the secondary reason being appearance, entirely on account of passenger trains. There are two causes of fire; one is the locomotive, and the other the open windows of the passenger train smoking car, which is quite a prolific cause of fire in this country in summer.

I have known quite a number of cases where fires have been
283 caused by throwing cigar stubs from smoking car windows, and many other cases where they could not be otherwise accounted for; e. g., where a passenger train causing fire was coasting down a grade and not working steam, and there wasn't any spark flying. I have personally found cigar stubs in rotten stumps that caused a fire, in 15 minutes after the fire started.

In many of the items, the additional speed of the passenger train offsets any additional weight of the freight trains; that is true on

bridges, to a great extent. The damage to bridges is caused more by train impact than by the actual dead load, and the impact is very much greater as the speed increases; the impact causes the vibration, and the vibration causes the danger to bridges.

In repairs to track, the freight train on a well kept up tangent would be a little harder on the track than a passenger train, but on a curve a passenger train causes more damage, because the outer rail must be elevated to suit the passenger train speed, and on that account the freight train causes considerably greater damage than it would if the elevation was right for the freight train; also, it reduces the load the freight engine is able to pull around the curve. Especially on a road like the South Shore, where they have no tie plates on curves, it causes cutting the ties by the rail, canting over the inside rail, and spreading the track, making it necessary to reguage often and adds tie renewal. Another item is the creeping of rails in soft places, which is aggrevated considerably by the excessive speed; that is an item that should be divided into train unit.

In removal of sand, snow and ice, there is a difference in favor of the passenger trains, due to the necessity of keeping the passenger trains moving during snow storms. It is customary for freight trains to be left in during heavy snow storms, because it would be impossible to do any work along the road anyway, on account of not
284 being able to get into the side track, but the snow plows are run to keep the passenger trains moving, and the work they do must be done over again when the storm is over, to clean the road up for general business, as the snow fills in behind the snow plow.

To offset that, there is some cleaning of switches, done more for the freight than for the passenger trains; shoveling out of drifts happens occasionally, when the drifts are larger than can be taken care of by the plow, but, on the other hand, there is shoveling to be done on side tracks that is for the freight service only. I mean that the cost is increased by reason of being obliged to run the passenger trains, and that the greater cost, if there is any difference, should be attributed to the passenger trains.

On the South Shore, winter maintenance would come under item, Roadway and Track. That item is almost entirely labor; in winter, it is nearly always shimming track on account of heave spots, and this is necessary in direct proportion to the speed of the train over it. Shimming is much more necessary for passenger than for freight trains, because the passenger trains run at greater speed, and it is necessary to keep them riding smoothly for the comfort of the passengers. Shimming is quite an item of track maintenance in this country in winter. Without shimming, the track is not safe, especially for high speed. Taking out the shims is quite an expensive job, and must be done at exactly the right time.

The items to which I apply the revenue train mileage basis would on that basis be equitable divided between the two services in the proportion that each had caused the expense; in my judgment, that is the most equitable way. In the absence of any absolute figures as to which class of trains causes any of these expenses, this arbitrary method of division would be nearer to the actual facts than any other method.

285 I don't know that I am competent to testify with respect to the speed of South Shore freight and passenger trains; this question refers to depreciation of equipment, with regard to which I did not intend to testify. I intended to testify only to the depreciation of items under M. of W. & S.

When I said curve elevations not suited to freight service would reduce the hauling power of locomotives around the curve, that is a matter of engineering calculation; but I could answer that only in theory, not having any practical knowledge of the effect on maintenance of equipment. In theory, I think it would increase the maintenance of equipment to some extent. Having in mind services performed by freight trains for passenger and common service, company material handled in revenue freight trains usually is quite a considerable item—the handling of ties, rails, scrap iron, and of material going over into passenger cars and engines. Even coal is sometimes handled in a revenue train. I do not know whether that is charged to the coal or not; It is on this road.

YOUNG.

Recross-examination.

By Mr. Wykes:

I have never testified to the propriety of the revenue train mileage basis for division of common expenses between passenger and freight before; at best, that is an approximation. I do not attempt to say that the division, when made, states the real expense caused by the passenger or freight service. I do not attempt to absolutely place the actual expenses; I don't think it can be done. I only make this basis as an arbitrary basis for the division, and as being the best arbitrary basis. I do not believe it can be done to any degree of refined certainty. My judgment is it is the fairest basis that has come to my attention. By arbitrary, I mean it is merely a

286 method decided upon on which to make this division; in some cases it will favor one class, and in others the other class, of service.

I meant by arbitrary that it was a method to be followed even if in some instances it was absolutely correct, as long as we are unable to get anything nearer correct; I mean it is a basis that goes outside the direct charge or direct expense, and takes some general rule of division. The reason I select this basis is because in my judgment the train mile is the unit of service.

I have never been called upon to compute the cost of a passenger or a freight train mile, or a series of either. It has been done by some accountants, as near as they could arrive at it, but I do not know how close they did arrive at it. It was done as an accounting, rather than an engineering proposition.

I have never for a railroad attempted to determine the cost of doing its passenger business. The passenger train is not the equal of the freight train in average length, number of wheels, tractive

force required to pull the load, number of wheel impacts, or amount of coal required per mile.

Starting with those two unequal elements, I state that the passenger train ran at a faster speed; that, other things being equal, would add to the cost on the items we have been referring to. I have studied the comparative cost, but not to get at it as finely as to find the degree of extra cost that would result from the greater speed, or to say how much more cost would result from running 40 miles an hour than 20; I could not pretend to give percentages, but I have made observation on the track, and been put to considerable extra expense on account of the increased speed of passenger trains over what they had been running before, and other trains as well.

287 Those tracks were tracks over which, at the time I made my o' servations, both passenger and freight trains were running constantly. The thing I referred to was absolutely certain. In the case of wear, the track had heaved slightly, but not sufficient, as we thought, to shim it; our time for passenger train between two points was shortened, increasing the speed, and we were obliged to brace and put tie plates and shims on this track, in order to keep it to gu*a*ge, when we had no trouble before the increased speed. If the track had been in perfect alignment, the extra work would not have been as heavy, but it was a typical winter condition in this country. I have not gone so far as to attempt to express in percentage or in amount per train mile the amount or degree of extra cost that would be required by the faster moving passenger train, and do not know any one who has. I know in a general way the relative speed of South Shore freight and passenger trains; I have been riding on them both quite often; I do not think I could give their average passenger speed, and I do not know the maximum permitted by their rule. I do not know their average or maximum speed for freight trains; I know until recently the extreme speed permitted by rule for freight trains was 20 miles an hour, but I don't know what it is now. I have never observed that they exceeded this maximum.

On the question of speed, the amount of tangent or curve enters into the question of the extra weight that you must give to the speed. I have not made a study of the amount of tangent and curve on the South Shore to reduce it to percentages, but I have been over the road a great many times, and I know in a general way how the road runs for tangent and curve. Railroads vary in the amount of tangent, the amount of curve and the rate of speed; that causes a variance in the accuracy of the revenue train mileage basis, applied to railroads generally, as a class.

288 There might be a slight variation, but, taking it as a whole, I do not think, so far as my observation has been, there is any material difference on any great length of railroad in this vicinity. I know sometimes they claim the revenue train mileage basis to apply to all railroads generally as a basis of division between passenger and freight. If it were applied to the South Shore, I would not say whether it should or should not apply to the Michigan Central, without giving the matter more study as to condition.

Q. Have you made any investigation to determine the degree of

accuracy of apportionment of expense that can be reached in the application of the revenue train mileage basis on the South Shore?

A. Personally, I do not think that there is any way that you can prove or disapprove what is or is not correct or accurate.

Q. And it gets right back to this, does it not, when you consider the whole subject, it is just a matter of your judgment?

A. Well, that is all I claim, that it is my judgment of what is the proper basis. I would just go back to my statement that it is the most correct basis in my judgment; it is the nearest to the correct basis of any that I know, and also that I have made a great many observations to prove in certain different items. That is the direct effect of the train as a unit on certain conditions on bridges and track, but not to reduce it to percentages or actual cost.

In instances I have watched the effect of each particular train on certain things independently of the other; e. g., I would be under a wooden trestle watching the effect of the impact of trains on it—a freight train and a passenger train striking and going over the same trestle in an especially weak part I was giving consideration. In some cases, it was a question of creeping track, where I wanted
289 to determine the effect of the different trains on the track; and then this other case, the effect of the high speed trains in spreading the track.

In addition to the speed as weighting the passenger side of the wear, I spoke of the super-elevation of curve due to the speed. That is a very material element in the cost of maintaining curves and ties thereon; it also produces some influence on equipment. That is something that probably takes more of the track men's attention than any other one thing, due to the passenger service—that, and the shimming. In order to determine the weight to be given to the elevation of curves, it would be necessary to give consideration to the amount of curve, and to the degree of elevation, which must be in such condition as to allow the maximum possible speed, if necessary. They must also be in condition to care for the maximum possible speed of freight trains, should that exceed the passenger train speed. I do not think greater weight at the same rate of speed requires greater elevation than less weight; there is no recommendation by any engineering society that recognizes any greater superelevation for heavier than for lighter engines, even on the same speed. The weight hasn't anything to do with the formula.

Q. Now, the precise loading of the passenger side, due to the existence of curves and elevation, you have not been able to work that out as a percentage?

A. No, I never attempted to work it out in percentages or in any other way, except we know when we elevate a curve, for instance, for passenger train speed, that the low side of the curve takes the whole load of the freight train and continually increases the elevation, and it is necessary to take up the low side very often—usually once a year, or even oftener sometimes.

290 The wear on curves is due to the tendency of the inside wheels of the engine to travel faster than the outside, which keeps the flange against the outside rail; the gu*a*ge side of the inside

rail never wears on a curve. The only way rail fails is by flowing of metal caused by the slipping of the inside wheel. If done before the rails are too far gone, they can be transposed, and the cold rolled metal is better for the traffic than if it had not been in the track before.

The fact that the passenger train, due to extra speed, is on the track half the time of the freight does not, in my judgment, reduce the fire risk; it makes almost as many exhausts, and our records show more fires from passenger than freight engines. I have considered that the freight trains move under full load, at the maximum power, and burn more coal. I think from the locomotives alone the fire risk would be about equal.

For sand, snow and ice, there is considerable hand digging, around terminals, cleaning switches, which is quite a considerable cost, but the switches must be cleaned in order to use the main track for the use of the sidings, it being necessary to clean the switches to make the main track safe, both in the country and in the yards. Every switch has to be cleaned, and that is a considerable part of the expense. The snow plow is put on to clean for both purposes; the passenger trains are kept running during the storm, when freights are not. This snow plow work during storms is not as good as permanent cleaning.

Frequently, the snow plow goes over the road twice the same day, and still leaves the road blocked at night. Some of the side track cleaning is done with snow plows, and some has to be shoveled; usually, no more men are employed on this account, but the men
291 use their spare time between storms to clean up; that is, the men in the yard, and section crews.

The shimming is usually done by the regular crews, the size of the crews being guaged by the amount of shimming and other work. Usually, we have as many section men in winter as in summer, when we have a heavy fall of snow. The shims are taken out in the spring by the regular section crews.

As to weighting the passenger side of the cost, I mentioned the carrying of company freight in freight trains. The weight that should be given to this varies in proportion to the traffic; I would not attempt to say how much that was, but, of course, there is a considerable amount of it done.

The carriage of workmen on passenger trains is usually inconsiderable, the larger number being carried on work trains. On passenger trains is carried more or less material, supplies, company mail, and passes for both classes of traffic, and the companies' employes of different character. I have not attempted to refine between those, but merely mentioned that item as being worthy of consideration. I do not think of any other thing that would weight the passenger cost, speaking generally of the items mentioned.

Q. You have not determined the weight that should be given to any one, or to all of those collectively, have you; any one separately, or all collectively?

A. Not any definite figures at all.

There are some things which would make the cost of the freight

side heavier; among those is the greater freight tonnage. To determine whether that had sufficient weight to counterbalance the speed would involve an investigation into that greater tonnage; that would affect some of the items, but there are many that it would not affect materially. I don't think there would be any way of measuring that effect. I don't think it affects any item very
292 much, unless it be the wear of rail, the maintenance of track on tangent, and re-surfacing track. I don't think it affects such items as bridges, though you very often have to strengthen bridges for heavier locomotives. I don't think you would have to get the number of wheels and types of your locomotives in each class. Of course, the comparison between the classes of locomotives would have some effect.

Bridges seldom fail on account of dead load; they fail on account of impact and vibration, more than any other way. According to my observation, the impact and vibration is not longer and does not become more violent through the passing of a long freight train as the end of it passes over the bridge. The greatest strain on a bridge is when the engine first strikes it, and then it settles down to a steady uniform strain. If the speed was the same, the impact would increase with the increasing weight. Impact is a very uncertain thing with the best engineers; we merely know that impact causes a lot of trouble, but it is pretty hard to measure it.

I did not give any account, in applying the revenue train mile basis, or in saying it was proper, to the greater length of time that a freight train uses the track in making a given mileage; I do not think account should be taken of this. I did not take that element into account in fixing weather costs. I did not take into account the fact of whether freight trains are or are not as carefully inspected, and whether the wheels are or are not kept up and as frequently inspected, as passenger trains. I did not take into account the greater number of derailments, etc., in the freight service than in the passenger service. I did consider the different types of locomotives in freight and passenger service. My opinion as to the propriety of the train mileage basis was made up before last night, when I saw this statement; I then knew the types of locomotives, but I did not look
293 into the details of their measurements until last night.

In weighting the freight side, I did not take into account the greater use of terminals by freight trains. I understood that most of these freight tracks were allocated to the freight service. That was not the basis on which I answered that I thought the revenue train mileage was proper. I took what information I had into account, and I understood that there were a greater number of tracks allocated to freight service; that is partly the reason I did not take into account the greater use of terminals by freight trains.

We have woods branches, used for switching, to run in and get freight cars, on L. S. & I., but do not run any trains on them. The expense of maintenance of those tracks should be borne by the traffic that passes over them directly. On trackage of this class, we make no train mileage; my idea is that the expense of maintenance of those should be borne by the freight service. I was not informed

of the amount of stational switching done by South Shore freight trains. I knew that this stational switching was done, although I did not know the amount of it. I did not take that into account; I took into account the movement of the trains on the main track.

Q. And that is the element that would weight the freight side, is it not; if there is a large amount of stational switching it would make the freight side of it to that extent more expensive? I am talking about maintenance?

A. These are kept in a separate account; that is, the repairs of the side tracks; they are not kept in the same account with the repairs of main tracks. I do not know whether the South Shore keeps them together.

294 Naturally, the stational work of freight trains would increase the maintenance cost slightly, but, aside from rail wear, I do not think it would be noticeable; your weather and wear cost go on just the same. So far as stational switching involves the use of the sidetracks, that did not enter into my division on the revenue train mile basis, as I presume the side track accounts were kept separately, and that their expense, where not used by passenger trains, was assigned to freight. The use of side tracks by freight trains, to allow passenger trains to pass, I attribute to the passenger trains, and that would weight the passenger side further than what I mentioned.

The locomotive movement of starting and stopping does not cause any wearing, unless the engine slips and burns the rails, which is inconsiderable. There may be greater stress in starting and stopping, but it does not seem to hurt the rail any unless the engine slips; slipping is more liable to occur on larger diameter driving wheels, like those used on passenger trains, than on an engine with more tractive power. There is more frequent starting and stopping in freight than in passenger service. I do not think there is any more wear at switches than in main tracks; there is no hammering on the frog, except going in on the side track, to take the sidetrack movement. There would be a little lurch in taking the sidetrack on a sidetrack movement; I don't think the increased wear by a train running on the main line is noticeable.

The only reason I can give why costs resulting from weather depreciation are to be divided on revenue train mile basis is because that is the unit of service; it is just the question of what is the proper method of dividing the cost that the running of the train has no effect upon. I do not think weather costs should be divided upon the relative time of use; in the first place, it would be

295 such a hard thing to compute, and it would be cumbersome. That is not the reason I did not use it; it is because I did not think it would be fair, or as good a way. I considered that, and thought of several things besides, but have not been able to arrive at anything that was practical, except this train mile basis.

These weather costs are here for the purpose of running trains; that is the reason that these costs are accrued.

Q. Yes, but when you get back of the whole thing, the trains are run to carry tons and passengers.

A. Yes.

Q. And when you apply the revenue train mileage basis to a division of weather cost, you are right in saying that it is an arbitrary basis, are you not?

A. Yes. I think any basis is arbitrary on those items.

Q. What expenses are incurred in producing the train movement, the actual movement of the train, that is, the propelling force of the train itself?

A. You mean the labor cost, and the fuel, water and roundhouse expenses?

Q. The roundhouse expense is not in the movement itself?

A. It is chargeable to it.

Q. It is the water and fuel and labor of the employes, is it not?

A. Yes, those are the forces that cause the train to move, and that cause the wear on the train itself.

Q. If the revenue train mileage is correct, shouldn't it approximate the wear on the train itself. Should not the wear on the tracks?

A. Oh, I don't think that has any relation whatever to the
296 other; I think that the wear on the train itself may be caused to some extent by the construction of the train, whether it is constructed to take care of that.

Q. That is the same thing that is true of the track, is it not?

A. Yes.

Q. That element would enter into both sides?

A. Well, the point I was trying to raise is that the things do not go together. The track might be constructed well and the train might not, or vice versa, so that the relation between the cost of maintaining your equipment and maintaining the track might not have anything to do with each other.

Q. And, other things being equal, assuming they were equally well constructed.

A. I would not want to say they would.

Q. Should not the wear produced by a force bear some relation to the force that produces the wear?

A. I don't think so.

Q. Why?

A. There are certain elements in a track, for instance, that wear in one place ten times as much as in the other produced by the same force that produces a less wearing in another place.

Q. True. But that same element in the track produces a wear back on the thing that runs over it?

A. No, there are lots of times in this particular case, a soft track would form a cushion and reduces the wear on the trains. That is very noticeable in years gone by, where tracks were built on muck dumps, making it very easy on rolling stock and very hard on the track.

I have not attempted to apply any other basis than the
297 revenue train mile basis; I considered several others, but did not attempt to apply them, as I gave them up as not being practicable—not fair to the service. I have never made any figures

based on a revenue train mileage basis of apportionment on any railroad. I did not study the accounts of the South Shore to determine it, but am familiar with those of L. S. & I. I have nothing to do with any accounts except the M. of W. & S., and with those I am familiar only on L. S. & I. I did not study them on the South Shore, and do not know what results would be produced.

As to how close the cost divided on the revenue train mile basis would be to actual cost, I do not think anybody could say what the actual cost is, except to devise some method of dividing it from their judgment and observation. I do not know how close the cost divided on revenue train mile basis would be from actual cost, except from observation.

Assuming the average number of cars per freight train on South Shore is 17, and it increases the number to 19, and thus decreases the freight train mileage, while the passenger mileage remains the same, I should still divide the weather cost the same as I did the other costs in any case, arbitrarily, on the revenue train mile basis. I do not think it would change the situation in any way regarding dividing it on a mileage basis; this is regardless of the fact that the company did the same business, with less car mileage, and that the factors of division were not factors which produced or affected the weather cost. That is because we have not in the item of weather cost any precise division, and that you must be arbitrary. The division on the other items would necessarily be the same, and I think those should be the same as the other.

298 YOUNG.

Redirect examination.

By Mr. Eldredge:

In answering Mr. Wykes, that the revenue train mile basis might not be absolutely correct, I meant it might not be absolutely correct in certain portions of certain items; in other words, certain portions of certain items might overrun and other portions underrun.

I think the question of delays to freight trains by precedence given passenger trains would enter into my judgment, but I did not speak of it because I was dealing only with M. of W. & S. costs. In my judgment, the revenue train mile basis would assign less of the cost to the passenger service than ought to be charged to it. I intended to say that, if there was any error, it was in the way of imposing costs on the freight traffic that ought to be borne by the passenger traffic.

I intended to say that the tracks in exclusive freight use were probably allocated to freight service alone, and did not come into this. We carry side tracks on L. S. & I. as a separate item, but don't separate between passenger and freight. The ore yards, for instance, I didn't think were included in the total of M. of W. & S. expenses.

I also had in mind track serving exclusive freight houses; as a matter of fact, I merely had that idea in mind, thinking that these particular tracks had been allocated on the appraisal of the property. I

don't know any way the cost of maintaining those could be gotten at, unless by changing the system of accounts and keeping them separately in the time books.

In the application of the revenue train mile basis in determining these maintenance charges, I think the exclusive ore and exclusive freight tracks in any large freight station ought to be ex-
299 cluded, before the method will correctly divide the expenses. If the passenger tracks and the freight tracks are approximately the same, neither one ought to be excluded.

I had in mind, when I said that (evidently referring to cross-examination), more especially the tracks used exclusively for iron ore. I do not know but what there are some places where you might have some exclusive freight tracks that are not offset by passenger tracks. As I think of it now, I don't think of any; in this town, there are probably more passenger tracks than freight tracks.

YOUNG.

Recross-examination.

By Mr. Wykes:

I did not have in mind, making this division, that these branches, such as traffic spurs, industry tracks, etc., over which no train mileage is made, were included in this maintenance. I thought they were and that they ought to be set apart to freight.

My Wykes: I wish to make a motion to strike out Mr. Young's testimony in entirety, because of making a division of expenses upon an arbitrary and a fanciful basis, not being an actual apportionment, and being out of line with what is permitted by the recent decisions of the United States Supreme Court.

YOUNG.

Redirect examination.

By Mr. Eldredge:

Since previously testifying, I have examined Complt.'s Ex. 1a, Riggs. I then stated it was my judgment that a division on
300 the revenue train mile basis would give a larger share of the burden to freight traffic than is absolutely fair, after excluding certain trackage I mentioned. I have gone over this exhibit, showing the lengths of the tracks, and have drawn off the tracks I intended in former testimony to exclude. I find on figuring the length of track that the amount of maintenance on them would be relatively so small that I am quite sure a division on revenue train mile basis would not only include this cost, but more, and, in fact, I think nearly enough to include all the branches, which I testified should be excluded.

I said all the branches and certain of the side tracks, in amount (now ascertained) 45.32 miles, should be excluded; an estimate of

maintenance on that amount of side tracks would be about $11,000 a year—a very small percentage of the total maintenance charge. I am sure that there is enough other costs to more than make up this difference. I estimate cost of maintaining side tracks as $250 a mile, that being the average cost of maintaining side tracks on L. S. & I., where the traffic is much heavier than it is on these tracks; $300 a mile for maintenance for industrial branches and $275 a mile for mine tracks, as fixed by Mr. Lytle, are, in my judgment, high.

I have a record of actual cost of maintaining some mine tracks in which South Shore owns an interest and of which it maintains a part; this cost, covering 4 years, averages $180.15 per mile, the highest cost being $360.38 and the lowest $30.45. The average of the two high years is $325.88; the two low years were years of evidently light traffic on these tracks. On M. M. & S. E., where we have kept similar tracks to the industrial tracks, our average maintenance cost for 1913 was $142, which was higher than two previous years, on account of more tie renewals.

The side tracks from which these figures were derived were our ore yard tracks, where we have our heaviest traffic; our ore cars
301 are higher center of gravity than most of the South Shore ore cars and the tonnage through these yards is pretty heavy. I am confident that the side tracks, as a whole, on the South Shore would not approximate the cost of these particular tracks. The ore tonnage is greater on the L. S. & I. than at the special yard at Presque Isle where all our iron ore passes through; the tonnage of ore on L. S. & I. this year was 2,250,000 tons.

YOUNG.

Recross-examination.

By Mr. Wykes:

Q. You have stated that in your judgment a larger proportion of the cost of maintenance of way is attributed to the freight traffic than is due to it, by the application of the revenue train mileage basis; can you express that in any figures, any percentage, or in anything other than as rests in your judgment?

A. No.

Q. And that depends on all of the features which you have stated, in former testimony, affect the two different sides of the problem.

A. Yes, that depends on those features.

Q. And it is simply your judgment that one would be a little heavier burdened than the other, with this method?

A. Based on experience, yes.

Q. And on the things you have testified to?

A. On the things I have testified to.

The mileage, 45.32 stated, was side tracks and exclusive ore tracks, not including branches. I did not know that there was any South Shore main line not used in passenger business; I did not take
302 that into consideration. I presumed, also, that the branches would be excluded, although I think they would be at least

partially covered by the difference I spoke of. The L. S. & I. cost of maintenance is variable; in 1913 our highest cost per mile of main line was $945.01, and our lowest, excluding a switching branch, which ran $211.88, was $323.49.

Our road (L. S. & I.) is divided into sections, the average cost for each being:

	1912.	1913.
Section 1, main track, Presque Isle ore yard, 1.37 miles (main track only)	$669.38	$914.01
Section 2, from section 1 toward Ishpeming, 5.52 miles	845.76	323.49
Section 3, west from section 2, 7.87 miles	335.01	490.61
Section 4, west from section 3, 6.2 miles	439.73	434.25
Section 5, south main line (not used for hauling trains)	292.23	194.46
Section 6, North Lake Mine Branch, 6.36 miles	211.88	179.23

I regard sections 1 to 5 inclusive as distinctly main line. Those include no expense of side track maintenance; we have that separate. The average per mile for side tracks, for the same period, was:

	1912.	1913.
Section 1, 13.37 miles (9.72 miles in 1912)	$243.02	$238.16
Section 2, .32 mile 1913, .5 mile in 1912	435.18	150.40
Section 3, 1.49 miles 1913, 1.50 miles 1912	121.82	203.21
Section 4, 7.08 miles 1913, 5.2 miles 1912	152.97	210.75
Section 6, 5.76 miles 1913, 5.87 miles 1912	346.09	601.20
Section 7, 3.65 miles 1913, 2.92 miles 1912	91.83	123.96

303 Section 1 is ore yard, with very heavy traffic; section 2 is ordinary side track; section 3, side track; section 4, there are some tracks called side track, used for loading ore; section 6, track composed almost entirely of yards for making up iron ore trains, and mining tracks, shifted for steam shovels; section 7, mining tracks, to mines not working in 1912.

On Section 7, and some on section 4, the tracks were so new that they needed very little tie renewals. I think the costs on the M. M. & S. E. would run a little lower; our costs on that road ran quite high this year; we did quite a good deal of work there, part of which is charged to operating.

There is a little higher center of gravity on all ore cars than in the ordinary merchandise freight cars. At high speed, the effect of this is detrimental to the tracks; at ordinary speed it has no noticeable effect. I presume that same thing would be true of a high loading of a freight car, raising the center of gravity; I presume it couldn't be to such a great extent as on an ore car, because the freight cars are so much longer that it would be impossible to get the load in it. Raising the center of gravity has the effect of exaggerating any bad spot in the track at high speed; the engine,

is the initial shock to the track, but if ore trains were run at high speed, it would make the track maintenance higher.

I have made no investigation to determine the effect of the continued vibration after the initial shock on track, more than to note the expense necessary to keep the track up. It must add to the rail wear, but I don't know that it would add materially to other costs; it might add to displacing ties and ballast. It has been our experience that it does not add to the creeping of ties.

304 YOUNG.

Redirect examination.

By Mr. Eldredge:

Trains are run on L. S. & I. only from Marquette to Ishpeming; there are only two short passenger trains, and they don't amount to much. The special maintenance in reference to passenger trains does not cut much figure on that part of our road. I wouldn't attempt to make any comparison between L. S. & I. and South Shore. I don't think it would be exactly fair to make comparison. Considerable money has been spent on L. S. & I. and charged to cost of line that materially reduces maintenance charge.

Section 4, is our new main track, and section 7 has no traffic to speak of—an occasional switch engine goes up there for ore, and last summer there was a passenger train twice a week.

(This witness was later called to testify before the Court.)

305 On July 19, 1912.

ERNEST J. DUBE, a Witness called by Plaintiff.

Direct examination.

By Mr. Eldredge:

I have resided at Houghton 28 years; in real estate business from 1888 to 1909. I was secretary and treasurer of Houghton County Loan & Investment Ass'n; I know value of real estate, Houghton and vicinity.

I know D. S. S. & A. property described in Complt.'s Ex. 1, Riggs, as Houghton Terminal, 12 acres, 1,550 feet of water front, with riparian rights, depth 150 to 350 feet; I estimate its worth at $35 to $40 a front foot.

(Map, Complt.'s Ex. 16, Riggs, showing property of D. S. S. & A. at Houghton, offered in evidence.)

DUBE.

Cross-examination.

By Mr. Wykes:

A piece of property within 500 feet west of terminal on water front sold within 18 months to Carroll Foundry. No other sales of water front property within a year or a year and a half. Within five years, there has been sold in this vicinity, a block of land where Amphidrome stands, a piece to Peninsula Wholesale Grocery Co., and another near and west of depot and terminal. Amphidrome is 200 feet back from water. The piece starts from water front. The Amphidrome Co. paid $100 a front foot for it with riparian rights. That piece was nearer the village than D. S. S. & A. towards the bridge, north and right back of main business part of city.

The piece sold to Carroll Foundry adjoins Carroll Foundry on east, runs back to Carroll St., and is 200 feet on the harbor line and 190 feet on the back. I was commissioned to sell this piece for $10,-
000. It sold for possibly $500 less. Principals made deal;
306 I don't know exact price. This piece lies closer to business part of town than the railroad property. It is only 300 feet from the old town, which is main business section. The terminal grounds are about 800 feet further east. The business center of the town is near intersection of Sheldon and Isle Royal Sts. This difference in location induced me to make difference in price. I added something because it was a large parcel, together, and the only available one for a large industry.

I am not sure it would be worth much less without the railroad on it. If the railroad were in the rear, all this would be more valuable, but lake frontage for business purposes, without railroad connection, wouldn't be worth very much. It would be worth much more than $50 a front foot if there were no railroad there, the property were all vacant, and it were wanted for railroad purposes.

On January 3, 1914.

DUBE, recalled by Plaintiff.

Direct examination.

By Mr. Eldredge:

I know the Mineral Range Station grounds at Houghton, shown on Complt.'s Ex. 16*a*, Riggs. It lies on the shore of Portage Lake between Is. Royal and Huron Sts., and averages about 440 feet deep along Isle Royal. It is block E and a part of block 4 in original plat of Houghton. In block 4 it is about 170 feet north and south from the Harbor line on the east, and about 115 feet on the west, side. I know its value for commercial purposes; it is $25,000, exclusive of improvements.

The right of way from east side of Ripley St. to west side of

Quincy St., not including that part of block E occupied as a depot and station ground, is 27,250 square feet, which I value at
307 75¢ a square foot., basing the value on the properties located each side of it. Between the west side of Franklin St. and east side of Ripley St., the right of way is 15 feet wide and 310 feet long, or 4,650 square feet, which I value at 35¢ a square foot, in the same way. The right of way from the South Shore terminal to the west side of Franklin St., 19,320 square feet, I value at 20¢ per square *feet*. It is my judgment that this narrow strip of right of way would be salable at present, assuming the railroad was not there, at $25,928. Assuming that the railroad was off, the people owning the adjoining property, Ripley to Quincy Sts., would be glad to buy this additional strip, to add to the properties they already own, and to pay this figure, in my judgment.

The Houghton people are seriously handicapped by not having a street on the lake front. We have a part of a street in the block, Franklin to Ripley, and no communication from that point to Quincy, so all the heavy traffic has to climb a hill and come on Sheldon, our best paved street, and the question has often been raised to acquire a street on the lake front, but, on account of extremely high price at which property is held, we have been unable to finance the proposition. If this right of way was vacated today and the village was privileged to buy it for 75¢ a square foot, it would be a quick transaction, in my judgment. Another reason for this value is that on each side of the right of way, between Ripley and Quincy Sts., is located the wholesale industry of Houghton. The Copper Range has purchased a right of way up to Quincy St.; (under objection as speculative) they are very auxious to come in, to serve these wholesale interests, and, if this right of way should be purchased by the Copper Range at 75¢ a square foot, there would be an opportunity to make some money, if I could purchase it at that price, and sell to them.

308 My opinion is, the ground lying north of the right of way, between Portage St. and the west end of the terminal, is more valuable than the terminal grounds. I am of the opinion that at the time the railroad came (1882 or 1883), this piece of ground from Portage St. toward the terminal was more valuable than the terminal property, as part of this was already platted, and several industries were already established on the lake shore adjoining the village plat, which plat was from Dacotah St. west to Franklin St.

309 On July 19, 1912.

WILLIAM D. CALVERLEY, a Witness called by Plaintiff.

Direct examination.

By Mr. Eldredge:

I first came to Houghton in 1860; have lived there continuously since 1881. I have been connected with a real estate firm there most

of the time since 1881, first as bookkeeper, and later as member of a corporation made up of large real estate owners. I have dealt in lands a great deal, buying and selling, both representing the corporation and myself. I own real estate in both business and residence portions, and know value of real estate in Houghton.

I know the property described in Complt.'s Ex. 1, Riggs, as Houghton Terminal, 12 acres, 1,550 feet of water front, depth 150 to 350 feet, and consider it worth $40 to $50 a front foot; I would prefer to call it $50.

CALVERLEY.

Cross-examination.

By Mr. Wykes:

Values have increased very materially recently in the section around Houghton to Chassel.

The Carroll tract, of which Mr. Dube spoke, is west of the terminal, adjoining, on the west, Crow's property, which is west of the building on Complt.'s Ex. 16, marked "office."

The center of business section is 1,000 feet farther west than the Carroll tract; terminal is east of Carroll tract. Carroll tract runs back 400 or 500 feet from Lake front. The land there has not been platted; is sold by metes and bounds. I don't know the front foot sale price of Carroll tract. The Amphidrome parcel is still further towards the business section than the Carroll tract.

310 CALVERLEY.

Redirect examination.

By Mr. Eldredge:

The Amphidrome property, costing the Amphidrome Co. $25,000, practically $100 a foot, is not nearly so deep as railway company's property. The present value of the Amphidrome property, exclusive of buildings, is at least 10%, possibly 25%, more than we paid for it. The sale was 10 or 12 years ago; value has changed since. On dock property, it has not enhanced materially, because boat companies have agreed only to deliver to one dock in a town, but, generally, growth of city would make it worth more.

The South Shore road, on the 63 acres east of School of Mines, runs a few rods from Portage Lake. The property on bluff sloping down to lake is the valuable property. It isn't possible for the railroad to run through best property, as the railroad lies down on the level. It is the right to the water front that adds largely to the value; to some extent, the railroad interferes with that here, because, running so close to the water front, there isn't room between it and the water front. So, between railroad and lake, generally, railroad decreases the value of the property very much. If there were sufficient room for cottages between railroad and lake, land there would be readily salable at much larger prices than I have named.

CALVERLEY.

Recross-examination.

By Mr. Wykes:

The quantity of water front property on the market at Houghton is limited, and the price is affected thereby. If ½ or ¼ of
311 the water front at Houghton were thrown on the market, there wouldn't be any ready sale for it at prices I have named.

CALVERLEY.

Redirect examination.

By Mr. Eldredge:

It certainly would be difficult to sell, if half or a quarter were thrown on the market at one time. That doesn't affect my judgment of present value, as that condition isn't likely to occur.

312 On August 26, 1912.

WILLIAM P. BELDEN, a Witness called by Plaintiff.

Direct examination.

By Mr. Eldredge:

I am 39 years old now, and reside at Ishpeming; previously at Grand Rapids. I have been an attorney for 17 years; was the local attorney for Michigan Central Ry. three years; have had experience in acquirement of right of way for railways, public service companies, and power plants, in Upper and Lower Peninsulas.

Near Grand Rapids, in Lower Peninsula, we paid two to four times the ordinary acreage value of land, to secure a right of way across a forty or other description of land. Same thing is true of Upper Peninsula. I have acquired at least 25 miles of right of way for all classes of corporations, 5 miles in the Lower, and 20 miles in the Upper Peninsula.

I remember the L. S. & I. acquiring right of way in Marquette county, from the C. & N. W. The land was sand plains, without cultivation or improvement; value was in no way affected by possibility of minerals. The price was $25 per acre. We got at least two miles of sand plains from C. & N. W., by purchase. We condemned a right of way on one forty, and possibly two, of same character, belonging to a private party, and paid $30 an acre for it. The character of that land was the same as land from Chocolay, on South Shore, to Sand River. As a result of that experience, Cleveland Cliffs Co. adopted the policy of fixing $25 an acre for railroad right of way, to all railroads, across lands of that character; to this $25, minimum, we add timber value, if any. This, I believe, is cheaper than the land can be acquired by condemnation.

I have been interested in purchase of many pieces of land in Negaunee and Ishpeming; and I know the value of lands
313 there, generally. I know the right of way of South Shore within corporate limits of Negaunee, known as the north line, as well as the new line of 2.6 miles near Negaunee mine. I also know south line, which extends from a point in the N. E. ¼ of S. E. ¼ of section 34, 48-26, to beyond limits of Negaunee east. In my judgment, a fair average price on that right of way for total of 86 acres, described on Complt.'s Ex. 8, Riggs, as mile post 163 to mile post 164, plus 2,800 feet, the 2.6 miles of new line, and mile post 9 to mile post 12, of the south line, would be $2,500 per acre, possibly more. I have paid more and less for land in that locality.

I had charge of negotiations for the 2.6 miles. From mile post 163 to mile post 164, plus 2,800 feet, the value of the land is at least $2,500 per acre. The value of the land of the new line, 2.6 miles, is $5,000 an acre or more, beyond question. The value of land, mile post 9 to mile post 12, south line, called the Marquette and Western, which crosses section 33, is $2,500 to $3,000 an acre.

We had to pay, through condemnation or purchase, the prices mentioned, or higher. On this 2.6 miles of new track, we paid $5,000 an acre for surface value alone, entering into a contract guaranteeing fee owners against loss from ore, which could not be mined because the land was burdened with railroad track. That was across N. E. ¼ of N. E. ¼, N. W. ¼ of N. E. ¼, S. W. ¼ of N. E. ¼, Sec. 5, T. 47 N., R. 26, W. From that point, and following the new right of way across the balance of section 5, and that part of section 6 occupied by the Maas, Lonsdorf and Mitchell Add., we paid $5,000 an acre for right of way, and located it, when possible, where ore was not likely to be found; i. e., on the rocks, where rocks could be located. The mineral rights are reserved, but mining operations cannot interrupt or interfere with safe operation of the railroad, which got a permanent non-caving right of way.

314 The right of way of South Shore across this entire stretch of land is permanent non-caving. We paid $5,000 an acre for it, and contracted to indemnify owners for loss through ore which had to be left in pillars underneath tracks. If ore is discovered, its quantity must be determined, and Cleveland Cliffs Co. will pay its fair value in the ground. I will produce a copy of that contract. South Shore right of way all through here is permanent, and cannot be destroyed by mining operations. Very few such rights of way are acquired.

Here is a map showing the Maas and Negaunee mines, and the old main line of South Shore crossing between the two. The ore body extends practically continuously from Negaunee mine across to Maas mine, going beneath the railroad tracks; there is a sandy formation which cannot be mined without caving the surface. To release the ore, the Cleveland Cliffs Co. contracted with South Shore to secure a new right of way, approved by its engineer, and to build tracks and fence, set up telegraph poles, and make it in every way ready for use, and South Shore was to abandon old right of way and quit claim to

us. The South Shore was only to abandon a definite portion covering exposed mineral body in Negaunee.

I think right of way from center of section 6, near end of old line, to mile post 167, on Complt.'s Ex. 8, Riggs, worth over $5,000 per acre, as it runs through the heart of town; I should say $6,000 or $7,000 per acre, without reference to minerals. I believe the value of 8,700 feet track rights, which is the track paralleling C. & N. W., commencing at mile post 167 and extending to limits of Ishpeming, known as the north line, is $7,000 or $8,000 an acre. Considering the title of South Shore, you couldn't buy a right of way across there for $7,500 an acre.

315 The deeds are not necessarily all alike, but mineral is reserved and might be removed, but in such manner as not to interrupt and interfere with safe operation of the railroad. The bond to property owners runs from Cleveland Cliffs Iron Co. to Pioneer and Arctic, to indemnify them for ore lost through being obliged to maintain the surface. This is only in case of Pioneer and Arctic company, and doesn't apply to all of them.

(Mr. Eldredge reads in evidence the mineral reservations of a deed to 8,700 feet, from Jackson Iron Co., consideration, $1, dated March 17, 1885.) This deed contains no provision as to who shall bear expense of moving track, nor for connection at either end. The Marquette and Western deed has latter provision. The quantity of the estate granted in the deed read was a right of way, an easement—not a fee. The Jackson Iron Co. has the land, so that it could grant a right of way without additional purchase, as it has never parted with its mineral rights to section 1, and only a small part of the surface.

The valuations I have given cover the naked land value, without improvements.

I know right of way of South Shore known as Teal Lake branch, extending from main line near gas plant of Jackson Iron Co. property to mines on Teal Lake. It crosses land of probable mining value all the way; Riggs' valuation of $1.50 per lineal foot for 7,300 feet is fair.

I know the right of way of South Shore to Milwaukee Mine, 13,680 feet in length, and believe Riggs' value of $1.50 per lineal foot fair. I think those rights of way would cost more today.

Considering 12 acres to the mile, I believe the value of south line of South Shore, which is old M. H. & O. line, and which
316 crosses the Jackson Iron Co. and Cleveland Iron Co. lands and follows the L. S. & I., to be $3,500 an acre.

(Mr. Eldredge states deeds to M. H. & O. right of way are straight conveyances, with no question of trackage rights or conditions involved, except reservation of the mineral, and produced deed from Cleveland Cliffs Iron Co., dated June 16, 1871, which he read into the record; he also produced and read deed from Cleveland Iron Mining Co. to the Iron Mountain Co. dated June 3, 1857.)

I know south line of South Shore in Ishpeming, west from that concerning which I have just testified. It contains 38.2 acres, and runs through a section of the city available for business purposes.

I believe it worth $3,500 to $5,000 per acre. I know north line in Ishpeming, and believe it worth $7,500 an acre through the center of town.

I would place an average valuation of $5,000 an acre upon that strip extending to limits of Ishpeming, both east and west, covering the business section of the town and from the East New York mine until you get out beyond the present Cliff shaft. I am considering the kind of right of way the South Shore has. If a railroad company were willing to take a right of way from which the mining company could compel it to move, on notice, it could get it for less. The prices I have named represent the actual value of surface rights, such as South Shore has, but you could not buy for that price.

Here, mineral rights are reserved but the railroad rights are predominant. (Witness illustrates, by relating failure of Pioneer Iron Co. to reserve right to compel removal of tracks when deed was made to the Iron Mountain Railroad in 1857, which failure, he says, cost the Cleveland Cliffs Iron Co. several hundred thousand dollars
317 in building a new line of 2.6 miles and trading that for the old.) Such experience demonstrates the great value of permanent rights of way, which could only be procured today at prohibitory prices.

(Mr. Eldredge states that 5,000 lineal feet right of way through the heart of the business part of the city has been excluded from the last testimony of witness.)

I would put a valuation of $3,500 an acre on the strip of land extending from Union Park to a short distance west of mile post 169 on north line, as it is vacant land. I would put about the same valuation on that strip west of the heart of the town, extending from Cliff shaft to Winthrop Junction.

(Mr. Eldredge here read into record deed from Excelsior Iron Co. to Marquette and Western Railroad Co., dated 26th of November, 1886.)

I would say that that section of a mile or so extending through the heart of Ishpeming from the gas plant on the east, out to Cliff shaft mine on the west, is worth at least $12,000 per acre, on the theory of six lots to the acre, since this strip is lined by buildings used for business purposes. This averages $2,000 per lot. I feel certain a right of way like this could not now be purchased for Riggs' valuation of $150,000.

I believe the 23 acres in Winthrop branch of South Shore worth $2,500 an acre; an average price for right of way of Palmer Branch, to the Palmer mine, is $2,500 to $3,000 an acre.

The value of the 3.2 acres right of way of Mary Charlotte branch, bought of the Cleveland Cliffs Iron Co. with a removal clause
318 on 9 months' notice, is, in my opinion, $3,500 an acre; we paid $5,000 an acre for one similar.

(Mr. Eldredge produced deed dated Nov. 15, 1910, from Iron Cliffs Co. and South Shore for 3 strips of land. He stated it contains

most unfavorable reservation clause of all, to effect that if grantor cares to use right of way granted, for mining purposes, it shall give grantee 9 months' notice, and if grantee fails to remove tracks grantor may remove and charge expense to grantee. Also, after such notice, grantor shall not be liable for damage to any property, and shall be saved harmless by grantee, if latter does not remove tracks.)

I consider that branch profitable enough to justify paying $3,500 per acre for right of way; it hauls lots of ore, and will for years. In fixing that price, I took into consideration that much of the land in that vicinity has been entirely withdrawn from the market by mining companies, that they will neither sell nor lease, that land in the vicinity of the city commands a very high price, and that we have paid for our railroad as high as $5,000 an acre.

I am not sufficiently familiar with land west of Ishpeming limits to put a price on it. We bought right of way for L. S. & I. as far west as Joplin, up in North Lake district. We paid the value of the land plus timber value, with the proviso that the grantor can put us off on 9 moonths' notice.

I think the value of main track from Winthrop Junction west, which connects the two main tracks and is called "the horn" (1,000 feet in length), is about $3,500 an acre.

319 BELDEN.

Cross-examination.

By Mr. Wykes:

The line of L. S. & I. to Joplin was acquired under my general supervision within last year or two; the titles obtained were similiar to that in last deed Mr. Eldredge read, providing for removal at option of mining company at a stated period at expense of railway; I think but one deed without that provision. We paid about the surface values there. The land is not exactly agricultural land; there are some farms out there. I don't suppose that land worth over $25 an acre, but this crosses mineral district, and to purchase permanent right of way I feel certain would require from $2,500 up, because of possible damage to mining operations. There is a vast difference in acquiring these rights of way, as to the quality of rights of way you want to get.

An important element would be the fact that they are not permanent; yet, in city rights of way around Ishpeming and Negaunee, the land has an actual surface value in the market at prices approximating those mentioned. When I spoke of $2,000 an acre in Ishpeming, I meant a lot, say, 6 lots to acre; that is a very moderate commercial value of that land aside from railroad purposes. Add to that, excess cost for railroad purposes, and you would get amounts approximating what Mr. Riggs had. In my experience, we have to pay several times the commercial value of land, to get it for right of way purposes.

When you go through towns, procuring rights of way, cutting across city property, the owners always insist that the location of railroad track in the vicinity of their property is of itself an element of damage, and they raise the price accordingly. I cannot lay down an exact rule, but we have had to pay 2 or 3 times ordinary
320 value, even in cities—right in Negaunee—both by condemnation and by purchase.

The clause in a deed requiring railroad company to remove tracks at option of grantor would be a distinct disadvantage to railroad company, regardless of whether in city or some other mining locality, as removal might cause very large expenditures, and it is almost impossible for railroad to get new rights of way through that district. There are extensive mining operations carried on in vicinity of these cities; they are mining underneath Ishpeming.

The Cleveland Cliffs Co. controls Iron Cliffs Co. I had charge of sale, by the latter to South Shore, of right of way of Mary Charlotte Mine; transfer one of considerations for inducing South Shore to give up old rights of way and consent to removal of their tracks to new right of way. We purchased, built and equipped 2.6 miles of new right of way for them, besides furnishing this, and at least one other, right of way deed.

The values I placed, ranging up to $12,000 an acre, were not entirely based on idea that title of South Shore did not require removal of track at sole option of mining company at railway company expense. I considered permanent right of way of greater value than one which could readily be removed, but have learned that lands through Ishpeming and Negaunee command a high price for market purposes. The purchases I have in mind are purchases for surface rights for mining companies. The mining companies platted and sold lots on the surface, and the deeds drawn in light of experience of mining lawyers of that time did not contain caving clause. Now, all sales reserve right to cave the surface, if necessary, for mining purposes. We paid very high prices for surface rights containing those reservations. That varies considerably with the location
321 and structures on the land. The mining company has no right to condemn for caving rights, and there is no way for it to acquire, except by purchase.

In Forsythe Township, Marquette County, in Gwinn district, the Munising Railway Co., to reach certain new lines, including one on Sec. 35, condemned lands, securing an award of about $30 an acre; the expense increased the cost to over $300. That was in district where we were paying $25 an acre to C. & N. W. The ownership of lands in the locality where these condemnations were made, was not in the mining companies as generally as in the Ishpeming and Negaunee district at that time. Since that time, the Cleveland Cliffs has fixed a policy of $25 an acre, plus timber value, in sales for railway purposes.

In line, mile post 163 to mile post 164, plus 2,800 feet, I fixed a value of $2,500 an acre, average; some was purchased below, and some above, that price. Across the same sections, I condemned a right of way, a year or two ago, and across this very tract leading to

our Negaunee mine. In the condemnation proceeding, becoming apprehensive that we were not going to get the track at all, because of possible value for mineral purposes, I filed a waiver of rights against the mineral estate, and stipulated that if mineral was found, and mining operations required, we would remove the track at our expense; that waiver was subsequently ratified by our board of directors, and I then got a verdict at from $1,000 to $3,000 an acre for that right of way. We crossed the Barassa, Marketti, and Martell parcels. They were owners of land lying east of Negaunee mine, in a region where existence of ore was uncertain. The mining companies have had options on some of that land, which were abandoned; yet it is possible mineral region. The attorneys for defendants pressed the value of the property for minerals pretty strong.

322 and raised the question of validity of the waiver, but I told the jury it would be ratified by our company, and they evidently relied on that.

Opposing counsel made the claim that the waiver would not accomplish what I claimed for it, and that it was not binding; that point was presented to the jury, and there was no decision upon it by any authority except so far as it entered into the jury's determination. I was afterwards told by two or three jurors that if we had not done that we would not have gotten the verdict. The highest price paid in this condemnation proceeding was along this piece of tract I am asked about. I paid $300, with a removal clause, across a forty near there for the L. S. & I.; I think that was the lowest price.

The lowest price paid without a removal clause was where we paid the Pioneer and Arctic Iron Co. $5,000 an acre on new 2.6 miles right of way, and Cleveland Cliffs entered into a contract agreeing to indemnify Iron Co. from all loss of ore, if ore was found, which might have to be left as pillars to sustain the track. I don't think we have bought or condemned any right of way in locality of Barasso tract except that had removal clause; all our rights of way had removal clause except this South Shore track, and I would think the lowest we paid there was about $1,000 an acre; that was by condemnation, and was the Martel tract. I have in mind that the South Shore has a permanent right of way through there; it gives it a greater value than these other rights of way with removal clause.

I believe land owners there would be glad to pay $2,500 an acre, or more, if South Shore would exchange its rights of way to one which would permit a removal whenever mining operations required it. The removal clause does not cut much figure unless in ore district.

Where South Shore track is, is a possible ore district. It is

323 difficult to say where eastern boundary of ore basin is; it may not extend that far east.

Q. In your condemnation proceeding, in which you condemned the Martel, the Marketti, and the Barassa tracts, as you have stated, wasn't there an attempt in that proceeding to indicate the ownership of most of the lands in the locality by the Cleveland Cliffs and the associated companies, and the fact that those companies would not sell under certain prices, which were very high?

A. Yes, they attempted to show that; they attempted to show a good many things in that case.

Q. The jury was somewhat influenced by the fact, was it not, that the L. S. & I., which was a constituent company of the Cleveland Cliffs, was purchasing that property:

A. I don't think so. I think in the end, as soon as they got by the question that they were possibly tying up any material value there was in these lands, they then sat down and figured out what they thought was the fair value of the land exclusive of the mineral element.

Q. But that influence was urged upon the jury by the attorneys in that case, both by the questions and by argument, was it not?

A. They urged it.

Q. And very strongly.

A. Well, I didn't think so. I thought it was a good deal of a bluff.

Q. In that proceeding, didn't certain of the witnesses testify to values there of $100 an acre for the lands that you were about to take—certain witnesses for the railroad company?

A. Well, I don't remember; we offered proof tending to show a very much lower value than the jury awarded, and I don't recall now just what those figures were. I haven't looked up my notes.

Q. Who were the witnesses.

324 A. Well, let me see, we called, as I remember, Mr. E. C. Cooley, of Ishpeming, and I think we had Mr. Asire of Marquette, two that I have in mind, outside of any connection with our own people. I think those were our two principal witnesses on value, outside of questions I asked our own men.

Q. Were the records of the proceedings taken down?

A. Oh, yes.

Q. Transcribed?

A. Yes, they were never written up because there was no appeal taken. We paid the judgment, and the other side did not appeal.

Q. Isn't it a fact that in that proceeding Mr. Townsend testified to a value for those lands of $100 per acre?

A. Well, now, I don't remember what value Mr. Townsend put on them; I know it was a great deal lower than the jury awarded.

Q. Do you remember what value Mr. Cooley put?

A. Well, I started out to prove in those proceedings a valuation of a $100 to $125 an acre, or something like that, and I might say frankly that I thought these figures that I am giving you when I first began to have to pay them were pretty high—that they were in the nature of hold-ups. But when I found that all other railroad companies were paying the same, and that those values generally prevailed, I made up my mind that perhaps I was wrong.

Q. You started out with the idea that was worth about $125 an acre?

A. Something like that; I thought these prices were too high. I thought so, and I went out and contested several condemnation cases around Negaunee, on the theory that we were being held up, and when I found these different jurors giving these prices, and

other people paying them, I made up my mind that my judgment was wrong.

325 Q. Didn't you fix your idea of $125 an acre from the fact that in that immediate vicinity, and in the same year of your condemnation proceeding, your company had purchased lands at a hundred dollars an acre?

A. We attempted to show that the prices we paid a mile or so away from there ought to be governing here, but we didn't take into consideration certain facts that these men showed at the trial, and that is that this was a flat, level region in the vicinity of these new mines which are being opened now at Negaunee and furnish really the only available building site for the new homes that will have to go up in Negaunee, and that is the way they made their——

Q. (Interrupting.) Wasn't that rather proven in the Collins case than in this case?

A. Both cases. The Collins' is in a different part of town. They are now being opened up. There are two new shafts being sunk, one at the Lucky Star mine, and one at the Breitung Hematite mine, and plans are being made for a third one at the Athens mine, all within a comparatively short distance of this territory. That will mean the employment of hundreds of more men in Negaunee, and those people have got to have some place to live, and, in that case, Mr. Barassa, who tried the case for his father, Mr. B. F. Barassa of Chicago, offered proof tending to show the volue of this property for building lots, and that is the way he demonstrated its value and got his high verdict.

Q. The condemnation proceedings that you have had have all been for the Cleveland Cliffs or its constituent companies?

A. Have all been for the Lake Superior & Ishpeming Railway and the Munising Railway Companies. I think I also began one for the Marquette & Southeastern. Those are all companies owned and controlled by the Cleveland Cliffs Iron Company.

326 In fixing $2,500 as an average price, I considered number of sales at lower and at higher prices. City of Negaunee condemned N. W. ¼ of Sec. 33, T. 48 N., R. 26 W., for cemetery. It lies north of east end of new south track, 2.6 miles long. I finally paid $300 an acre for it, after being asked $450.

I did not consider this 40 acre tract as being $3,000 per acre, in arriving at $2,500 valuation. We used about 25 acres of the 40. It was the N. W. ¼ of N. E. ¼ of Sec. 33. The deed reserved minerals. I have not made computation to get at this $2,500 valuation, but base it upon various transactions I have made, considering both worth and cost; in other words, what it would command in market. I have had in mind also right of way we condemned for L. S. & I. on the N. W. ¼ of S. W. ¼ of Sec. 33, the E. ½ of S. E. ¼ of Sec. 32, and the S. W. ¼ of S. E. ¼ of Sec. 32, T. 48 N., R. 26 W.

We condemned lands of 3 owners, the Barassa, Marketti, and Martel families, and purchased from South Shore Land Co. We paid about $3,000 to Barassa and $1,000 to Martel people. I don't remember the prices paid South Shore Land Co. There was no other condemnation or purchase on that line. I have also purchased

flowage rights in this section, and right of way for L. S. & I. north of and only a few hundred yards away. For this last I only paid $300, but we claimed that this seller had no title, and won in the lower court, but thought it safer to buy what title he claimed.

I have also in mind purchases of part of new South Shore main line, starting from mile post 164. All these rights I have mentioned are temporary, and must be moved for mining operations. I have had only three condemnation suits in this vicinity of Ishpeming and Negaunne, none in other counties. We have been talking about the spur extending from north line of the L. S. & I. road,
327 which runs through the Collins tract over to Negaunee mine. I also condemned some rights of way for line through Collins tract. On that part of the line, from Maas mine west past Teal Lake, and over to main line of L. S. & I. west of Negaunee, most of land was acquired from subsidiary companies of C. C. I. Co.

Purchase price and kind of conveyance have never been fixed on deals with those companies. They owned fee, while owner in Collins tract only had surface rights, and mineral estate would control railroad operations. In lots in that tract, values were affected by presence of houses.

Main line, where I have fixed value at $5,000 an acre, was purchased before Barassa and Collins condemnations. Deal was completed Nov. 10, 1908; Negaunee mine owners acted as unit. Two men fixed the prices for them at $5,000 across part of Negaunee mine property known on my map as Maas, Lonsdorf and Mitchell Add. Addition lies in S. E. ¼ of Sec. 6 and S. W. ¼ of S. W. ¼ of Sec. 5, T. 47 N., R. 26 W. There was 5.22 acres in that portion of right of way that was fixed at $30,000 and paid in cash. Balance of right of way across east end of Negaunee mine property, from addition to east end of property, containing 3.20 acres, was adjusted in general transaction, on theory that $5,000 an acre would be paid for it. Title to 5.22 acres was held by Lonsdorf, Maas, and Mitchell families. Three men originally owned in common, but they are dead, and ownership is broken up.

Fee owners have leased mine to C. C. I. Co., which has transferred lease to Michigan corporation called Negaunee mine, which is owned partly by C. C. I. Co. and partly by Lackawanna Steel Co. Geo. J. Maas and Geo. Lonsdorf were committee for fee owners, none of whom are stockholders in C. C. I. Co. or Negaunee mine. Deal was approved by owners of both fee and lease before title passed.
328 Lease holder had nothing to do with fixing price. Negaunee mine was benefited by removal of track, which interfered with its operations, and will pay a portion of the cost. Leaseholder got none of consideration. Expense of removal was apportioned between Negaunee mine, Maas mine, one-half of which is olso owned by C. C. I. Co., American Mining Co., a subsidiary of steel corporation, and Cleveland Iron Mining Co., a subsidiary of C. C. I. Co. Negaunee mine was only interested in getting best bargain, as it was paying part of price.

The 10.96 acres acquired of Arctic and Pioneer Iron Companies is situated as follows: .11 of an acre in N. W. ¼ of N. W. ¼ of Sec. 4-47-26, 3.95 acres across N. E. ¼ of N. E. ¼ of Sec. 5, 2.45 acres in N. W.

¼ of N. E. ¼ of Sec. 5, and 2.05 acres in S. W. ¼ of N. E. ¼ of Sec. 5, all in same township. The other parcel, 2.30 acres, is west of the Maas, Lonsdorf & Mitchell Add.; in Sec. 6, extending across S. W. ¼ of N. E. ¼ of Sec. 6. There is also .15 of an acre in N. W. ¼ of S. W. ¼ of Sec. 6.

Of parcels in section 6, Pioneer Iron Co. owns surface estate and one-half mineral estate, while other half of mineral estate is owned by Arctic Iron Co. Other parcels in Sections 4 and 5 are owned by these companies jointly, each having undivided half interest in both estates. One-half of Arctic Iron Co. is owned by Breitung-Kaufman interests, who set price on this land, while Cleveland Cliffs interest, which owned Pioneer Iron Co. and one-half Arctic Iron Co., sought of it lies in same section with Martel land. I don't remember exact for ore under tracks.

Cemetery land, purchased for $300 an acre, is in N. W. ¼ of N. E. ¼ of Sec. 33, north of mile post 164, on Complt.'s Ex. 1. Some of it lies in same section with Martel land. I don't remember exact price paid for latter. Price through here was $5,000, too,
329 fixed by Mr. Kaufman with reference to value for building lots on account of opening new mines. Three new mines, the Lucky Star, Athens and new Breitung-Hematite, are soon to be opened in this vicinity, to employ many men, and this right of way was most available for buildings.

About 10 acres purchased was from Maas, Lonsdorf & Mitchell estates; $30,000 was paid for 5.22 acres. Mr. Townsend was not quite right on consideration, but was right on area, when he said $30,000 was paid for 8.93 acres.

There were several matters adjusted in this general transaction. Lease held by Negaunee mine didn't assure it right to cave land, and we wanted that fixed. Furthermore, fee owners claimed that right of way to be abandoned would revert to them as abutting owners. We adjusted these matters, and got new right of way, by paying $30,000 for privilege of amending lease, $30,000 for new right of way, and $26,475 as advance payment on royalties to be allowed fee owners for abandonment of claim of reversion. All told, they got $86,475, but I have only considered that we paid $5,000 an acre for this right of way.

This was all one general deal, and it is difficult to say how much was paid for any item. I have always thought we paid more than $5,000 an acre for this land. $5,000 an acre was adopted for several other parcels, excluding those purchased from two iron companies and Maas, Mitchell & Lonsdorf estates. One parcel, owned by Iron Cliffs Co., in S. E. ¼ of S. W. ¼ of Sec. 33, went in at $5,000, as they thought they ought to have as much as others. Expense was to be reapportioned to subsidiary companies by C. C. I. Co.

Parcel in Sec. 33, last mentioned, was in third forty south of cemetery land. Surface estate owned by Maloney, and mineral by Seager and Smith people. We paid Maloney $3,500 for four
330 acres across his land. His parcel adjoins description in which Iron Cliffs Co. was allowed $5,000. We had to get two deeds, one from surface and one from mineral owners. I don't remember

what we paid the Seager and Smith interests. There was also parcel (1.70 acres) crossing N. W. ¼ of S. E. ¼ of Sec. 33, owned by Burt heirs. That was on extreme east end, and price was lower and brings down average.

Of another piece, N. E. ¼ of S. W. ¼ of Sec. 33, surface was owned by Martel heirs, and mineral right by the Seager and Smith interests. I don't remember what we paid for either. It is east of the ore basin, although eastern line of basin is very uncertain.

I have now taken all that right of way, and only contract to indemnify owner was given to Pioneer and Arctic Companies. Prices which were fixed when Cleveland Cliffs interests were represented on both sides were influenced by verdicts in Collins condemnation case. Prices allowed in suit were much higher than we thought land was worth. Connection of the L. S. & I. and C. C. I. Co. was shown in Collins case.

It was shown that C. C. I. Co. and constituent companies held large acreages not for sale at all, or at very high prices. It was also shown that this was the only feasible right of way through Negaunee. I don't think jury was prejudiced by attempted showing that land was wanted by a railroad controlled by C. C. I. Co. I now believe award was about right. We paid award, plus all costs and attorneys' fees.

I have made no purchase near Winthrop branch, but have been over it, and know situation through handling leases and contract between C. & N. W., Lake Superior Iron Co. and L. S. & I. My judgment on value of that right of way is based on my general experiences in Ishpeming and Negaunee district.

331 As to Palmer branch, I bought right of way for L. S. & I., running south and parallel with it, out to Rolling Mill mine. We crossed some land owned by the Breitung-Kaufman interests, and also some Pioneer and Arctic, and they charged us $6,000 an acre, with privilege of requiring removal of track. On Complt 's Ex. 8, Riggs, their tracks to rolling mill start from old main line of L. S. & I., on N. E. ¼ of N. E. ¼ of Sec. 7, and extend to S. E. ¼ of same section.

We went across land of Negaunee Iron Co., which is owned by Breitung-Kaufman people, and had to pay $5,000 an acre for it, on the theory that it was available for building purposes. All land purchased there was from them.

The original main line of L. S. & I. across south side of Negaunee runs by Queen mine, in S. E. ¼ of Sec. 5, and our deed required us to remove the track. Regent Mining Co., occupying Queen group, notified L. S. & I., and we had to build new main line from Maas mine west, by Teal lake, connecting with our main line at Negaunee.

BELDEN.

Redirect examination.

By Mr. Eldredge:

Character of ore mined under my house at Ishpeming is different from that in Negaunee basin and that on south side of Ishpeming.

It comes out in hard chunks, like coal, instead of like dirt. Even in this hard ore, it is necessary to leave large quantities of ore, in pillars, to support the surface. Soft ore mines at Ishpeming and Negaunee are operated extensively on caving system, which means that slice of ore is taken out and support then moved, so that the ground above the surface may cave in; then another slice is taken out and again caved in, etc. This is safer for men, and cheaper.

332 Whole workings and surface go down in this way gradually. In south Ishpeming, where old workings of hard ore are, they take pillar out after ore is out of the bottom, and surface is likely to cave. You can see large openings near the railroads and all around Ishpeming. Under my house, the South Shore tracks and town, they leave large pillars, even though they are 500 feet down. Ground between South Shore tracks and C. & N. W. tracks in Ishpeming, to which ordinance provides for removal, is quite level, and cost of removal would be light.

Cleveland Cliffs Iron Co. owns and controls about 2/3 of the stock of L. S. & I., and not all, as previously inferred. Other 1/3 is owned by Jones and Laughlin Iron Co., of Pittsburg, so all dealings are same as though strangers. Same care is used to make all deals between C. C. I. Co. and subsidiary companies just and fair. C. C. I. Co. would charge L. S. & I. same for land as any other Railway.

By known ore bodies, I mean sections where operations have been carried on and ore is located. Until operations have been carried on, no one knows of ore bodies, for certain.

By Pioneer and Arctic contracts, ore not only has to be left immediately beneath tracks, but far enough out on either side of the right of way to support it. If workings were 800 feet deep, you would have to stop mining operations at 400 feet from right of way line; the rule is that ore will cave at such an angle as will take a strip about one-half depth of operations.

Operations in Negaunee mine are about 800 feet deep. We have drilled holes at the Athens Mining property from 1,200 to 2,000 feet down; new shaft at Negaunee mine is about 700 feet.

333 I think price of $5,000 for their land is fair. In the Arctic and Pioneer tracts, fee owners know that three new mines would increase population of Negaunee, and that these lots would be available for building. I finally agreed with them. Mr. Kaufman took the position that indemnity from C. C. I. Co. might not be good in future, as company might lose standing. He only consented to railway there at all as an accomodation, and only wanted fair price.

Costs of purchasing land for right of way is very heavy—counsel fees, traveling expenses, gathering data and information, and dealing several times with people through different agents.

I think owners of easterly portion of this tract, who lived away from here, received the fair value of their holdings. People differ as to future of a country, but we dealt with men capable of taking care of themselves. At heavy expense, we hired lawyers in California, sent one from Seattle to Canada, and another on a long cir-

cuit to get those papers signed. The land at the easterly end of the tract, Eagle Mills, is not worth nearly so much as nearer the settled portion of Negaunee.

Cleveland Cliffs Iron Co. was offering land on lease in Negaunee, subject only to mineral right. No mining company will lease without that reservation. Known mineral body extends under settled portion of Negaunee to some extent.

West end of land I valued at $5,000 an acre comes right into town. Buildings are near it. Section is built up, and building lots are limited. New main line of South Shore strikes old main line near center of Sec. 6, which on this map (Complt.'s Ex. 17, Belden) is only short distance to where hotel is located, interurban line to Ishpeming ends, and important business buildings are located.

334 Main street is two blocks away. Best residence district in Negaunee.

Main street is not paved, but there are sewers, water and electric lights. From there, right of way crosses southern part of Maas, Lonsdorf & Mitchell Add., which contains only a few houses. On south side is Sterling's Add., which has a large number of houses and is available for buildings. We paid $30,000 for 5.22 acres from Maas, Lonsdorf and Mitchell interests, and Mr. Townsend was wrong in including more than 8 acres to that sum.

It is estimated there are 800,000 tons of ore under the south two-thirds of old South Shore right of way, within lines drawn perpendicularly through side right of way lines, which are 60 feet apart. Ore is opened up on both sides of right of way; there is a shaft or two through right of way, so it is well known what is there. That is only a part of ore for which the charge was made.

As I said before, in order to maintain right of way, assuming depth of 800 feet, 400 feet on either side of right of way, or strip of 860 feet wide, would have to be left, but this 800,000 tons of ore is between perpendicular lines of a forty foot strip of a sixty foot strip. When abandoned, south two-thirds of right of way belonged to American Mining Co. and north one-third to Cleveland Iron Mining Co.

The Pioneer Iron Co., grantor of the right of way, sold largest tract to one Adams, who sold the land on north and south of right of way and bounded it by lines of right of way. He then quit-claimed to Cleveland Iron Mining Co., which sold south two-thirds of right of way to American Mining Co. South Shore had only an easement, and right of way, therefore, reverted. People who owned land on the south side adjacent to right of way claimed it, and they could dictate terms to us.

335 Deed from Pioneer Iron Co. of the right of way was peculiar in that it was a warranty deed of land, while the board of directors had only authorized granting of usual right of way, and copy of their resolution was attached. We took the position that, since instrument exceeded authority, it passed only right of way. South Shore could only acquire land for right of way.

Longest term leases in Ishpeming-Negaunee district are for 20 years, and they are terminable, on reasonable notice, for mining operations. Most are for shorter terms. Many owners of houses here

rent ground for small annual ground rent and taxes. This is general, and not limited to one company. Leases provide that opportunity shall be given to remove buildings upon termination.

Ground rents are small, and only nominal; for instance, lot worth $1,500 rents for $12.00 a year. Lease is generally renewed if land is not needed. Leases are not limited to our own employees, although they are preferred. Tenancy is at will, in case mining operations reach point, but is really not at all will, for the only contingency that could terminate the lease is need of land for mining purposes, which need is determined by lessor. Grants of right of way are generally upon same condition. We have some terminable upon mere will of company, but we never accept them if we can help it.

Piece of land we had to perfect title on was in section 33-47-26. Maloney mortgaged it to McKenna, who had no other title of record. We bought from McKenna, and 25 years later Maloney sued in ejectment. We compromised for $300, but later found deed Maloney had given McKenna, which had never been recorded. We sued Maloney in ejectment, and won. That was description we bought of Muck.

336 On December 30, 1913.

BELDEN, Recalled by Plaintiff.

Direct examination.

By Mr. Eldredge:

I know the property described in Complt.'s Ex. 1*b*, as item 39, Marquette County. I think its fair market value approximately $500 an acre. I arrive at that value from the value of nearby or adjoining similar land, without improvements or timber.

Item 41 lies immediately west of item 39. As you proceed westerly, the value increases, and I think the fair market value of that parcel averages $750 an acre, in present condition, without timber or improvements. In all valuations hereafter, I will consider the land as in the same condition, unless otherwise indicated.

I think item 42 is worth, on an average, $5,000 per acre. I had charge of securing that entire right of way.

I don't think I placed a high enough valuation on item 43, when I testified before; I think that parcel averages in worth approximately $9,000 an acre. My reason is its proximity to the business section of Negaunee, extending from near the fire hall, at Division St., practically to the depot. That is all available and desirable for commercial and business purposes. I add $4,000 an acre for that reason. I am figuring that as platted, like adjoining property. This parcel extends from the point where the new main line joins the old main line, then to the junction of the south line near the depot; it adjoins the platted portion of Negaunee, and nearly the whole length of the business portion. If that were platted into lots, six to the acre, I estimate they would bring an average of $1500 apiece, basing my values upon what adjoining lots sell for.

337 All lot values there take into consideration the effect on the mineral value. I place the value in the same manner that we would place it on business lots adjoining. As nearly as I remember, I included this parcel in former testimony with parcel 42, at an average value of $5,000 an acre. In my judgment, this property, for city lots, is worth that sum an acre. In addition, it has a mineral value. The value of the right of way is enhanced over its commercial value by the fact that the South Shore has a title which entitles its railroad to remain there permanently, whether mining operations are desired to be carried on underneath or not. I am not placing a valuation on this enhanced value, but one based on sales, assessed valuations and commercial transactions relating to adjoining property.

I think parcel 44, situated in the heart of the business section of Negaunee, has the highest commercial value of any parcel of the right of way at Negaunee, and I give an average value to it, based on the commercial value of the land and adjoining land, of $12,000 an acre. Item 44 is connected on the east with item 43, which I valued at an average of $9,000 per acre, and on the west with item 45, which I value at $7,500 an acre. I place the highest value on the middle part of item 44, which includes the depot sites, and that is considerably higher than the $12,000 I mentioned to bring up the average of the whole parcel.

Item 45 extends across the property of the Jackson Iron and Cleveland Iron Mining Companies, from item 44 westerly across the city limits of Ishpeming. I think its fair value, for all purposes, about $7,500 an acre.

I place an average value on item 46 of $5,000 an acre, keeping in mind that its westerly end, which reaches nearly to the depot at Ishpeming, would be more valuable than its easterly end.

338 To value item 46½, I divide the property into two parcels, by extending the north line of Canda St. through it. The portion lying south of this line might fairly be valued at $4,000 a lot, 6 to the acre, and the northerly portion at $2,000 per lot, 6 to the acre. This property is immediately opposite the depot of the C. & N. W., whose right of way adjoins that of the South Shore on the south, and this particular parcel is a most valuable location for business or commercial purposes. Canda St. is shown on another map as Church St. The property I am describing covers three tracts there, one marked .15 acres, another marked .53 acres, and another marked .08 acres, and below these on the map a narrow strip colored in green. My valuation includes the right of way there, as well as the depot grounds (map of Ishpeming offered in evidence, Complt.'s Ex. 15*a*, Belden.)

To value item 47, you have to subtract from it the land described under item 46½, which takes the depot lots and 460 feet of the right of way. On the remaining 4,550 feet, I place an average value of approximately $12,000 an acre. I previously testified that items 46½ and 47 could not be acquired for less than $150,000. I still adhere to that view, because that involves consideration of the cost, at present, of attempting to secure, by purchase or condemnation,

through the heart of Ishpeming, a right of way for railroad purposes. I reached that conclusion by different methods of valuation entirely than the $12,000 an acre that I have given here, where I am speaking only of the value of this land for commercial purposes based on the value of adjoining land, exclusive of consequential damages or anything of that kind.

Item 47½ would be worth about $600, without improvements.

I modify the valuation I put on item 48, of $3,500 an acre, when I testified before, to about $2,500 an acre. A portion of the
339 land is not so very valuable. Its easterly end reaches over to the soft ore formation of the property on section 16, where Hematite Mine, of the Lake Superior Iron Company is located.

I am fairly familiar with the value of the right of way of the South Shore road west from Winthrop Junction, as far as Clarksburg, or about 10 miles west of Ishpeming. This would include item 49 and part of item 50. I place an average value of at least $100 an acre on that 10 miles of track; it might have a value in excess of that, on account of the permanent character of the right of way. I am not sufficiently familiar with the mineral formation all of that distance to fairly appraise the value of the permanent non-caving character of the right of way; I know from experience in purchasing rights of way for the L. S. & I., which parallels the South Shore for 7 miles of this distance, that it has a value of at least $100 an acre through that territory, exclusive of mineral prospects. That is what our right of way cost, on the average; our right of way is conveyed by a deed which gives the mining company the right to require the railroad to remove, on nine months' notice, in case the line is needed for mining purposes. The South Shore has a right of way which cannot be interrupted for mining purposes, whose additional value I am not attempting to appraise.

I place an average value on item 58 of about $3,500 an acre.

I place an average value of about $500 an acre on item 59.

I put an average value of about $3,500 an acre on item 60. That includes only the part in actual railroad use.

I give an average value on item 61 of $5,000 an acre.

340 I place a higher value on item 62, because that brings the right of way up to the depot property. I give an average of $7,500 an acre to parcel 62. There is a piece of right of way owned by the South Shore across this property, but it has not now railroad tracks upon it; it is where the overhead crossing of the Northwestern used to be. It is of the same value as the remainder of the parcel.

I put an average value of $3,500 an acre on item 63. The most valuable part is in section 10, where it crosses the platted portion of Ishpeming, and across big working mines. A part of this line described in item 63 crosses the Jackson Iron Co.'s property. There the element of value, calculated with reference to this being mineral property, is high, though it is not in the platted portion of Negaunee. It is 60 foot right of way from mile post 167.06 across section 1, about ¾ of a mile.

I give item 64 an average value of about $5,000 an acre. In previous testimony, I valued item 65 at $2,500, or more, per acre. I

then had in mind the cost of condemning that land and the consequential damages to adjoining property, but, based on the decision in the Minnesota Rate Case and valuing this land with reference to its value exclusive of such damages, I think I would reduce that to about $500 an acre.

I value item 66 at about $500 an acre, and item 67 at an average value of about $3,500 an acre.

I value the track rights to mines, being items 68, 69 and 70, in the same manner that Mr. Riggs and I valued others of the branches in my previous testimony—about $1.50 per lineal foot.

I previously valued item 71 at $2,500 an acre; I think that ought to be reduced to about $500 an acre.

341 On Defts.' Ex. 21, Hansel, is a narrow strip of land, colored yellow, commencing a little west of the Harvey lots and connecting the south line of the South Shore with the Palmer Branch. This is included in item 62. It is substantially the same value as the other land in item 62.

BELDEN.

Cross-examination.

By Mr. Wykes:

I am an attorney for a railroad located in this same locality. I testified on the previous hearing that it cost considerably more to purchase lands for railroad purposes than the normal value of the land, say, three times as much. That is borne out by my experience in the territory that I have been testifying about this morning.

I have condemned land for railroad purposes in this locality. In those condemnation proceedings, we had a number of witnesses who testified to very much lower values than I have given here today. Those lower values were not accepted by the jury, who, in each case, put values as high or higher, on mere surface rights, than I have placed here on permanent rights of way. The surface and mineral estates throughout this territory have been separated by deed, and are largely owned by different parties. In some of our condemnation cases, the petition was filed only against the surface owner. No condemnation suit tried in this county in the last ten years has ever gone to a decision on the value of a permanent non-caving right of way in the mineral district.

I think item 39 is not underlaid with known ores. The ore formation shown on the government geological maps does not extend as far easterly as this parcel. Geologists feel considerably uncertain as to the exact easterly limit of the ore formation. I eliminate the remote possibility for minerals in valuing that parcel. I have

342 taken into consideration the topography of the country there, and that this entire territory surrounding Eagle Mills has been acquired and is held as a town site for use, with reference to the territory east of Negaunee, where new mines are being opened up, and also its suitability and adaptability to railroad purposes as now used, but without allowing anything for consequential damages.

Eagle Mills has no population. The entire city of Negaunee is believed by geologists to be underlaid with iron ore, and that it is only a question of time when that city will have to be removed, to permit the mining of ore. This territory to the east, down as far as Eagle Mills, has all acquired greater value because that is the only place that the town can be removed to. That land is all acquired down there, by what might be termed permanent holdings, with a view to the future. West and south, you go right into the mineral formation again; to the north, the topography is not desirable for a town site. Nothing has been done to remove buildings to this place from Ishpeming or Negaunee; but within the last two years, the city cemetery, containing over 6,000 bodies was moved, as the first step in this direction, from the ore formation near the mines in Negaunee down to more than half the distance toward Eagle Mills; and it was put in that direction because of the probable location of the town in the future.

If that removal should take place, it would send values in Negaunee high up, because you have to buy that property before you can secure the removal of these buildings. The cemetery has gone a mile and a half west of Eagle Mills and at least 2 miles from its old location in Negaunee. If you were to eliminate the possibility of the removal of Negaunee to Eagle Mills, then I would treat this right of way at Eagle Mills about the same as the right of way west of Ishpeming, $100 an acre. We purchased N. W./N. E. 33-48-26 for $12,000, or $300 an acre, several years ago. It is about ¼ of a mile from this right
343 of way, and I know that the C. C. I. Co. now holds this Eagle Mills land at value I have given, or more. Within the last year, plaintiff bought a small lot here, for a section house, and we charged them $200 for it. They have not bought it yet, but are to.

The property in the city of Negaunee is not assessed as high as the valuation I place on it, and I have not considered assessed valuations, except in an incidental way. I think the assessed valuations in Negaunee are higher than the property is worth. I based my testimony on commercial transactions in the city.

In sections 33 and 34, we had a good many transactions with reference to land, not only in acquiring rights of way, but also in reference to riparian rights, along Carp River. The Negaunee mine drains the water which is pumped from the mine into a small stream which flows into Carp River, and it has caused that river to overflow on some of these descriptions; the owners have asserted very high values on that land, and we have paid quite large sums, by reason of those claims, and to acquire the right to continue flooding in the future. We did not buy a foot of the land; we simply purchased the right to flow the water from the Negaunee mine through those streams. It is only occasionally that it would overflow. They are using it for farming purposes right along. This situation took the water from the Negaunee mine through the nearest established water course.

There have been no recent transactions in the territory on sections 26, 27 and 28. I do not know of any other sales on sections 33, 34 or 35, except as is covered by my former testimony, nor any sales on sections 2, 3 and 4 of 47-26, except as covered in my former testimony with reference to section 4. I do not know of any sales on those

nine sections between individuals, although there may have
344 been small sales there. That property is practically all held
by mining companies. It is their policy not to sell the land; they lease it. The Cleveland Cliffs Iron Co. is holding its land with reference to future value. It is not for sale.

I know of no sales opposite description 39 between individuals. If there have been sales between farmers a further distance away, I have not those in mind, and have not used them as any basis for my testimony. I have used as such basis the sales to mining company, to the city of Negaunee, the contemplated sale to the South Shore, and the purchase of the water rights along Carp River. I think I would make the value of $500 an acre exclusive of the element of suitability for railroad purposes, although I stated that I used that element in my former testimony. The Iron Cliffs Co., a corporation the stock of which is owned by the C. C. I. Co., purchased section 35 at least four years ago. I do not know how the assessed valuation by the Tax Commission was obtained. I do not know what was paid for section 35. I didn't have reference to the price paid for this land, in fixing my value on item 39.

Item 41 lies in sections 33 and 34, 48-26. My value on that was placed on the same considerations as on 39, grouping all the considerations I have mentioned. As you come further west, you approach the mineral formation, where you have an added element of value. The $250 additional per acre on this tract is due, to a certain extent, to the fact that you are approaching the locality where there is a possibility of ore values, and to the general character of the land. It is nearer the city of Negaunee, and nearer the mineral formation, and for both these reasons I think it more valuable than the land at Eagle Mills. There is no ore body known that lays as far east as that. The west end of parcel 41 is almost adjoining what I paid over $1,000 an acre for, for just surface, on condemnation proceedings by the L. S.
& I. to build our track to the Negaunee mine. Less than one
345 forty from the west end of this parcel, the jury in 1911 fixed the surface value at $1,000 an acre.

I undertook to prove that those valuations were too high, but I never convinced anybody of it, either in condemnation proceedings or in purchases from private parties. We attempted to prove values at $100 to $500 an acre, as I remember it. There is a remote possibility of some mineral in this locality.

The sections through which item 42 runs is described in my former testimony. The $5,000 territory extended from the southeast corner of 33-48-26 to the center of section 6-47-26. We paid $5,000 for all except a small portion in the Negaunee mine property, on section 5. The purchase of that territory was based upon a commercial value of that surface for building purposes; that was the ground the owners took in putting that price on it, that this was the only territory available for building homes for the men who would live at the Lucky Star, Athens and other new mines about to be opened at Negaunee, and that this land had an actual value for such purposes, irrespective of railroad use or anything else.

There are some scattering houses down that valley; no new ones

since the track was put through; they are just sinking the shafts at the Lucky Star and Athens mines, and have not opened them up for shipment as yet. In locating this 2.6 miles, they selected the site regarded as least likely to affect the ore body, and a permanent right of way was given, so that the use of the railroad would never be interrupted. There is no known ore under this tract, but a great deal more than a possibility of ore. This district, as you come further west, enters the known ore formation, where there are working mines on both sides of the right of way, and it is quite different from the one you were asking me about a moment ago.

346 I do not base the value of this tract entirely upon the purchase which was made of the particular land itself. That price of $5,000 per acre has been asked and paid in that vicinity for at least 5 years and more last past, for railroad purposes, and in purchases of this character in that vicinity it would not be fair to apply to the price we paid the statement in my former testimony that we were often obliged to pay from 2 to 3 times more than the other value of the land when we were purchasing it for railroad purposes. This is the price which is put on that land and for which it is held. If you wanted to buy it for any purpose, I don't think you could get it at any lower price. It is all owned by mining companies or parties interested in the ownership of mining lands. None of it has changed hands within 5 or 10 years, except this strip and except in adjusting boundary lines or ownerships, or something like that. When I gave my testimony before, I had not informed myself as fully as I might have done, and, in reading over my testimony since, I notice the various things in which I thought it ought to be modified or changed or corrected in the way I have now done at this hearing. I gave what I thought was my best judgment at the time. It was not as mature in some respects as it was when I considered it afterwards.

To item 43 I have added $4,000 an acre to my previous testimony. The tract runs from the center of section 6 up to about the location of the depot property. I have affected this value with the present use of the adjoining parcels, without attempting to add anything to that valuation by reason of the fact that the railroad has what we call a permanent right of way at this point. I think that gives it an additional value, but I haven't attempted to appraise that. The lots are all sold subject to a reservation of the minerals. Some of the deeds have caving clauses, and some have not. All present sales are made by deeds which would enable the mining company to secure

347 the removal. Our companies will not sell any lots in that portion of Negaunee at any price; we simply lease them, under leases which fully protect mining rights and give the right to take possession.

Adjacent to item 43, the mineral estate is all owned by mining companies. The business property and surface is owned chiefly by individuals. Some of the lots are owned by the mining companies, which they will not sell at any price; some of the mining company lots are vacant and some occupied. I don't think of but one vacant lot owned by an individual. Near item 43, within the last few years, there has been erected the new fire hall of the city, right up Division

St., less than one block from this right of way. Across Division St., on the corner of that and Iron St., there has been a new two-story frame building erected—a business block. Right opposite the point where the right of way crosses the C. & N. W., the Negaunee State Bank has put up a very nice two-story brick building. The buildings I have mentioned are all within a block on the northerly side of this right of way. This is right opposite the best part of the business section of Negaunee. In the event of the removal of Negaunee, these new buildings will have to go. There are no present plans for moving Negaunee, and it will not be for a long time.

There has been no sales nearer than a block from the right of way; there have been, so far as I know, only these few sales that I have mentioned. In the values I fixed today, I have not used sales and transactions between individuals very much, to fix prices. I have made inquiry as to such sales as I could find out about at Negaunee, but there have been very few transactions between individuals.

The value fixed on the $24,000 an acre portion of item 46½ was due to its location near the C. & N. W., which adjoins the
348 D. S. S. & A. on the south, and to its location near the important business streets of the town. It is bounded on the west by First St., on the east by Second St., and on the south by the right of way and station grounds of the C. & N. W. Ry., and it is practically in the same block as the new postoffice site. There is a possibility of considerations affecting a parcel of property that would not affect the parcel adjacent to it or adjacent to the one affected.

When I divided 46½, the considerations which surrounded the specific tract on which I placed a value, double the other, are important, in my judgment, in determining what the value of that specific tract will be. In valuing item 43, I have considered the valuation of this right of way as if the railroad did not exist there any longer, and that the land included in the right of way would be naturally and immediately included in this platted portion of the town and be suitable for business and building purposes, like the rest of the city. To have the South Shore away would improve the value between the street intermediate Iron St. and the railroad. I took all those things into considerations, and thought that the price which I put on it would be a fair present value of the property. I considered the property just as it is.

With the few exceptions I have mentioned it is practically impossible to give you sales or commercial transactions through this mining territory. My judgment is based upon all the elements mentioned in my former testimony and this morning, including the commercial value, the assessed value, the possibility for railroad use, and the relation to the ore, taking into consideration the conditions of mining, and everything of that character. Another man, of the same ability, integrity and knowledge as myself, might hold an entirely different opinion. I would be surprised if another
349 expert on land values varied as much from my last figure as I did between my first of $5,000 and last figures of $9,000, if he took into consideration the same facts and circumstances that I have, and the same elements of value. I don't know any mathe-

matical calculation that you can apply in determining value of any property; all value is matter of opinion. My opinion is that in order to purchase the property a man would have to pay the values I have given.

I do not think there is anything strange in the fact that one-half of item 46½ should be worth twice what the other parcel is, considering its location and surrounding. If, instead of generalizing on a strip of right of way several miles long, we had gone in and taken the specific parcels and placed a value on them, we might have come out at a different result, but I have not been just guessing wildly here. I have considered with the utmost care, and in detail, these rights of way where I have put these high valuations; I have taken the trouble to go out on the right of way, personally, and see what use could be made of this land, if there wasn't any railroad there; just assuming it was ordinary commercial property, and see how this right of way would fit up with the lots from which it was taken, and the uses which would be made of this property in connection with adjoining property; I have based my value upon such consideration as that.

I have not been generalizing on long stretches of rights of way with the exception of that ten miles west of Ishpeming, where I said it was worth, in my judgment, at least $100 an acre, basing that upon our experience in acquiring parallel line. I have not refined the other descriptions as closely as I have refined 46½, but I can, if you wish. I can go on west from that and cover the next mileage, or I can go back to Negaunee, where I have put that high price, and tell you who owns the adjoining property and what it is used for,
and how this right of way would be available and valuable if
350 the railroad were not there. Where I said $3,500 on the
South line, running from Eagle Mills over to the Harvey lots, we paid in that vicinity as high as $5,000 an acre for rights of way, and over at the east end we have paid a good deal less. I took all of that into consideration, and struck an average of $3,500. All that was on purchases, not condemnation proceedings.

In my previous testimony, I fixed a value of $5,000 an acre on item 44, now valued at $12,000, with the statement that the eastern end of it was worth more. In reading over my testimony after it was written out, that was one of the parcels which attracted my attention as not having been valued at quite as much as it should have been, and I suggested to Mr. Eldredge that I wanted to raise that and to lower one or two others. My value was fixed by running the character of the plat of the adjacent territory through that and estimating on the basis of lots and considering the value of those lots for commercial purposes, like other property.

I have not at any time this morning intended to use the expression of suitability for railroad use as enhancing the value of any of the parcels which I have mentioned. I used the term more as descriptive, and perhaps ought not to have used it at all, but the values which I have given on all of these parcels have been based on my opinion and judgment of the commercial value of the property, regardless of railroad use. I formed the opinion that this railroad

property would have a value based upon the value of similar property in the vicinity of the right of way, or contiguous to it.

I think the railroad property in parcel 44 would be more valuable than the land south of the right of way, and substantially the same as the land on the north. One side is business blocks, hotel and various places of business, and the other vacant land and a sort of bluff. A portion of the land on the south side would be good
351 business property. There is a warehouse or two there, and then after you cross the street you encounter a bluff and rough broken land, not valuable for building purposes. The land north of the railroad is built up solid, and in arriving at its value I have taken into consideration the value of that property, as well as I could determine it.

I have had dealings with the occupants of probably half of the lots, starting with the Collin's house, where Iron St. and the railroad right of way converge, and running easterly to the hotel by the passenger depot; we have not bought or sold any of those lots. That land is valuable. It was acquired by the Jackson Iron Co. in the fifties, and they have never parted title with that land from that time to this, but have leased the surface.

These buildings I am speaking of front on Iron street, the main street of the city, which runs parallel with this right of way, and the rear of those buildings back up to this right of way. I have had dealings on account of some ambiguity in those titles. We haven't bought or sold, but have paid considerable sums of money in there, to straighten out difficulties of that kind. I don't think of a single sale in there. I have taken into consideration the rental value of property there, and its location, which is parallel to the main business street of the city, and the prices which have been paid for business lots around the city.

I purchased some lots for the school district, further up town than this, not over four blocks from parcel 43, and a little farther from 44. There we paid prices very much higher than anything I have given here. We began a condemnation suit, and it was settled amicably afterward, but the price per lot paid was very high. In my former testimony, I had taken the basis of $2,000 a lot, six lots to the acre, in the heart of the city of Ishpeming. When I came back and read this testimony and found that I had placed a great deal
352 lower value on this stretch through the business section of Negaunee, I thought it a mistake, as property was worth, in every respect, as much as the property at Ishpeming; land values at Negaunee have, on the whole, been rather higher than at Ishpeming.

I made my calculation, to begin with, at Ishpeming, basing it upon certain transactions where prices had been both higher and lower than that, and adopting that as a fair average value for this property right in the heart of the business section of the town, and then I applied that to Negaunee, because experience has shown us that land values in Negaunee are quite as high as, if not higher than, at Ishpeming. In fixing the $2,000 lot value, I had the sales in Negaunee of which I have told you, the school property, the railroad

rights of way, and purchase of lots in connection with mining property.

Since I was here before, certain lots on Main St., in Negaunee, have been sold at higher than the $2,000 a lot I am talking about. Main St. runs parallel with the right of way. Those lots would be opposite the westerly end of the 2.6 miles of new right of way. They took the title subject to mineral reservations.

Going back, farther east, A. Maitland is platting lots on the back end of his property, away from Main St., and fronting on what now constitutes a part of the abandoned right of way shown on Complt.'s Ex. 15. He has sold some of those lots at varying, but substantial, lot prices, with mineral reservation.

I would not say that I based my valuation of Negaunee property upon the valuation in Ishpeming. I simply mean to say that land values in Negaunee are probably higher than in Ishpeming, the reason for that being that there are now being opened in the vicinity
353 of Negaunee several new mines; there are three big shafts being sunk on the easterly side of Negaunee at present and others south. That will bring hundreds of additional miners to Negaunee with their families, and will call for the building of homes; that is the present need for building property that I had in mind when I was speaking of the high value for commercial purposes of the land along this right of way east, all the way down to Eagle Mills. That is the only direction in which the town can grow, and the territory along that, adjacent to it, will have a high commercial value for that purpose. The population of Negaunee is about 8,000 and Ishpeming about 12,000.

My reference to the removal of Negaunee is entirely a remote prospect, and the building of homes for the men to employ in these new mines is a present prospect. It may be that this generation will not see any change in Negaunee, so far as its removal is concerned. I did not intend to say that the Eagle Mills land had a future value of 400% on account of the removal at Negaunee. I mention that as something affecting its future value, but the thing which bears immediately upon this value, and the value of all the land easterly along the line of this railroad, is the opening of these new mines, and, while I may have discounted the future quite a ways in putting those values down at Eagle Mills, I think, if you take into consideration the immediate prospect for building there, that the valuations were reasonable. If we were to consider it from the standpoint of what it would cost to acquire a right of way, I wouldn't for a moment be understood as saying that you could get a new right of way through this territory for any such amounts as I have given.

I would feel absolutely certain that it would be beyond possibility for any railroad company to condemn a permanent right of way across this mineral formation, through the heart of Negaunee,
354 for any such price. Taking into consideration the location of known operating mines and mines being opened up, there isn't any other feasible right of way into Negaunee. I have made no computation to figure up what my valuation will amount to for the whole right of way. I realize that there is a limit to land values

beyond which a passenger road would not enter the territory to serve 20,000 people. That limit has not been reached in the figures here. I know that the figures I am giving are just what railroads have been paying to get in for all service. There is a limit beyond which it would not pay to expend money, but, as applied to these towns, they constitute a part of a large district where the business is of enormous value; the railroad wants to get in to serve the whole business. I am not attempting to divide my values on any basis of part passenger and part freight.

I have been in Ishpeming since May 1, 1903. Land values have gone up in that time; there have been very material developments, in a mineral way, in that district since then, and that general tendency has affected the entire district, because the prosperity of that district depends entirely upon a single industry, and the discovery of a new mine of iron ore helps to guarantee the permanency of the town and the employment of labor there, helps property values, and makes the prospect of additional mineral less remote. Mining men and railroad men in general have a conception of considerably higher values for land in and around Negaunee and Ishpeming than they did when I came there. The State has estimated a life for our mines of fourteen or fifteen years, and experience has shown that new bodies of ore are opened up from time to time, so that this district is still shipping at practically its maximum. Ishpeming and Negaunee have no other industry, and the future of those places depends upon the prosperity of the mines.

355 I fixed the value of Item 45 by the fact that it crosses, for a little more than a mile of the distance, section 1 of the Jackson Iron Co., where we purchased property for railroad purposes, and it also has the great element of value of the character of the title. The mineral value entered into this particular tract. In the values which I have placed upon land between Negaunee and Ishpeming which is not built up. I have taken into consideration the value of this permanent right of way to the railway company over a mineral formation practically all the way.

I cannot say that there are known ore bodies actually disclosed by drilling all the way from Negaunee to Ishpeming, but there are very strong mineral prospects. Rights of way are guarded by the Mining companies with the same degree of care as they would be if the metal was known to be there. A right of way is not an encumbrance alone because it occupies a strip of land which may be fifty or one hundred feet wide, but also because if ore is ever found it may tie up operations for a great width each side of that right of way, to preserve the right of way from caving. I don't know any known ore bodies that have been opened up by drilling along or under this parcel of land. There are no opened mines between Negaunee and Ishpeming. The State Board put high values on every description around Ishpeming and Negaunee that had any iron ore on or near it.

Without the presence of mineral or mineral prospect, the value of parcel 45 would be considerably less, probably in this particular piece of right of way more than in any other. There isn't very much building along this tract; a few miners' houses and gardens along it.

There is a little brush on some of it. The difference in the value of this tract and of item 46 is what I thought you would give to the mineral element of the right of way. Whereever a right of way is
356 on what is commonly called the soft ore formation, where the surface is likely to be caved, this element of value is very much greater than when you reach the hard ore formation, where the caving process is not used. There, mining operations may continue, as in Ishpeming, underneath it without interruption.

Parcel 46 starts out by Union Park, in vacant land, and runs right into the city of Ishpeming, extending almost to the depot, so that the west end adjoins warehouses and lumber yards, and some residences. Property of that kind in Ishpeming would be quite valuable, and I thought $5,000 an acre a fair value. Here, I am getting more into the question of the commercial value of the property, as distinguished from this element of mineral value, I would fix a higher value on the west end than on the east end of that strip. When I testified before, I put a value on the east end of $3,500 an acre, and I think that would be a fair statement now, and make it enough higher on the west end to strike this average of $5,000 an acre. I would bring $3,500 value for about one-half of the way. In my former testimony I had the value of the west end at $7,500 an acre, and the east at $3,500.

In fixing my values on Item 46½, I based them on specific sales only in part. There have been a few sales of vacant lots within a block or two of that location. The most recent is the sale of a number of lots, in the block immediately south, on the other side of the C. & N. W. right of way, to the Government, for a postoffice. I know nothing about the price, except what I have read, but the newspapers stated the consideration at $12,000. That value is somewhat less than I have placed on this property. The property in that immediate locality on the south side of the C. & N. W. right of way is, in my opinion, of considerably less value than these lots of which we are speaking.

Going over to Main St., on the corner of Main and Barnum Sts.,
357 the city bought a vacant lot and a half there, for a library site, some years ago. My knowledge of the purchase price is what I have read in the papers. I think it was $5,000 for about one lot, a block or so back from the business part, with nothing but houses all around it; but it is on a good corner. It is a lot and a half of the Excelsior Add., where the lots run about eight to the acre. I have taken that lot into consideration, and also the high rental value of property adjoining the South Shore right of way immediately west of First St. If there wasn't any South Shore railroad in Ishpeming, and we took this property into consideration only for its business and commercial purposes, that particular parcel, which I have defined as the southerly parcel here, would, in my opinion, be worth the price I have fixed. It has not been true there that parcels lying next to a railroad are worth less than those back a little distance. If you go one block to the west, where you come to Main St., the Miners National Bank and the Jenks Block, which contain two of the most important stores in Ishpeming, adjoin the right of way—the rear comes up to it.

On the next property to the east, the building is occupied by Carpenter Cook Co., wholesale grocers, and the fact that there is a side track of the C. & N. W. right at their rear door is of value to them. The next building is occupied by Swift & Co., wholesale meat house, in the same way, with a side track, and you might go right along the same way. Those locations are valuable, and are sought by business houses. In fixing the $12,000 valuation, I considered the same specific sales and the general situation of that property.

That portion of parcel 47 between First and Main Sts. is immediately in the rear of a very narrow strip of land. If the railroad were gone, all of this additional territory would fit right on to those short lots, and piece them out, and make them big enough so that substantial buildings could be put there, instead of small buildings, as
358 at present. Now, it is all built up with small buildings that rent for very high rental, considering the almost temporary character of the buildings.

In fixing the value of the north part of item 46½, I took into consideration the sales in Ishpeming mentioned, but I don't think you can figure out the value of any piece of property exactly or mathematically by reference to what something else sold for. I think each parcel must be determined according to its own particular facts and circumstances. While I refer to these other transactions as constituting some guide as to value, I think we must look at the property and see what it can be used for, and the use of surrounding property. My judgment there has induced the difference between the $12,000 and the $24,000 part of that parcel, rather than the application of one set of sales to one part of it, and another set of sales to another part. Having reference to sales, it was my judgment that $12,000 was enough for the north part of that description. Referring to those same sales, and taking into consideration, in addition, the location, and my knowledge of conditions, I thought $24,000 was fair for the south part.

In fixing the value on item 47, I went over this right of way again, having in mind particularly the questions asked me before. Starting from First St., west to Main, that portion of this parcel would fit right into the lots which front on Canda Street. This right of way between Main Street and Pine is extremely well located. On the east, it would front on the main business street of the town; on the south it would adjoin the C. & N. W. right of way, a portion of which is vacant there, and would make the most admirable location for warehouses or business houses. I am not considering any severance damage at all. I am considering what we would do with this property if the Railroad were not there, and I think that from First Street over to at least the middle of the block between Main
359 and Pine it would have more than the value of $2,000 per lot that I have put on it. From the middle of the block, between Main and Pine, and extending west for the remainder of the parcel, it would have less value, because there it goes through some rocks, and perhaps that would lessen its value on the north side; but I think that the valuation I have placed on that parcel as a whole is a fair average valuation. That takes into consideration that, all

along this portion of the right of way, on the other side of the C. & N. W. right of way, it is built up solid by business houses that back right up to the line of the right of way.

In Item 48, I still include a mineral value on the east end. On the easterly end, if there is mineral there, it is a part of the hard ore formation, and that element of mineral value doesn't exist to the high degree that I gave in my previous testimony. But, on the westerly end, you strike into the soft ore formation again, and, considering the value of the easterly end for commercial purposes, which is still in the built-up part of the town, and the mineral value on the westerly end, $2,500 an acre would be a fair average valuation. The first part of this parcel, starting from the east, would have quite a substantial value for commercial purposes; then you strike a stretch, through the swamp, of much lower value, and then on the west you would come to what appears on the map as soft ore formation. I would go down as low as $500 an acre in the cheapest part of the right of way.

On the east end west of the yard and right of way, it is all houses, residences of miners. The land belongs to the mining company. Many of the houses are owned by other people. All our leases to employees are made on a low annual rental of, perhaps, $20 a year, and they pay the taxes. The lease will be for twenty years on some of those additions, subject only to mining necessities. Our standard
360 form of lease is twenty years, subject to removal in case ore is discovered and it is necessary to open a mine. Many of the lots run $25 or $30 in taxes, making the total payments for the year not over $50 for a lot. The mineral, under the new law, is assessed separately, or else included in the value of the adjoining working mines. I have known of lots selling to miners for $500 or $600 a lot, but the locations which are occupied by miners are remote from the business section.

My figure of $100 an acre on Item 49 is an average, and a generalization. Some of it might go as low as $25, and some of it up to $200. I am basing my judgment quite largely on the average cost we paid on seven miles of right of way paralleling it. We actually paid a little better than $100 an acre on a right of way with deeds that the mining company can require the railroad to get off on nine months' notice. It is in a possible mineral location, but outside of anything that I have a definite knowledge of. Opposite this item 49, I did not base any of my judgment on sales, except the purchases of the railroad company. It is a mineral district, and there are no sales there.

Much of my testimony with regard to values is based upon my experience in purchasing lands for the L. S. & I. I might say of this, and of all these parcels, that I have based my opinion upon our experience in all these lines as I have outlined it in my testimony, and the considerations which I have mentioned on the parcels about which I have been asked would apply equally to the other parcels on the south line about which you have not asked. On the south line, there have been very few transactions between individuals, if any. There are no sales or present settlements of home sites. This

whole district is peculiar in its high land value, but it is easily understood when you consider that it is a mineral country, that the
principal industry is mining, and that it can, in a large part
361 of this territory, be carried on only by caving the surface, and
that has added, across these vacant lands, a great element of value to this right of way, which this company acquired years ago.

I don't know anything about the original cost of any of this, except the 2.6 miles, of which I had charge of acquiring under the contract between the C. C. I. Co. and the D. S. S. & A. Way over at Eagle Mills, there was some of that 2.6 miles that would go lower than $1,800, but it is my best recollection that there was no part of that right of way that we acquired at anything like as low as $500 an acre.

362 On August 26, 1912.

CHARLES V. R. TOWNSEND, a Witness called by Plaintiff.

Direct examination.

By Mr. Eldredge:

I live at Negaunee. I am, and have for 8 years been, agent for Cleveland Cliffs Iron Co.; am Land Commissioner for L. S. & I. and M. & S. E. railroads. For 8 years, I have been buying and selling lands in Upper Peninsula counties of Chippewa, Mackinaw, Luce, Schoolcraft, Alger, Marquette, Baraga and Ontonagon.

TOWNSEND.

Cross-examination.

By Mr. Wykes:

Through the territory covered by my testimony, the demand, and actual sale of land without timber to settlers, has been very large; it is rapidly settling. In the Alger district, there are very large settlements going on; in Schoolcraft, at Seney, the Western Lands Security Co. has sold a very large acreage at very good prices. The company is doing the draining. In Chippewa, I sold a very large acreage of land, without timber, last year to settlers. Luce county, south of South Shore, particularly Lakefield township, is settling very fast; that is splendid farming country—splendid farming communities.

I represented Jackson Iron Co. in a sale of right of way to C. & N. W. in Negaunee 3 years ago, being 1.44 acres; this was from the station ground west to what was called the diamond crossing. The consideration was $2,500 for 1.44 acres, with a provision that we can cave the track and put them off any time.

Q. Didn't you testify, on June 1, 1911, to a sale of acreage in the
city of Negaunee, as agent for the Cleveland Cliffs or L. S. &
363 I., to the C. & N. W., of land between the new depot and the
diamond crossing, right over the Jackson mineral body, 3

acres, and say, in answer to the question, "How much did they pay for it?" "A. They paid us at the rate of about $700 an acre, land that could all be platted, it could all be used for residence purposes, water and sewer; I have figured six lots to the acre."

A. That is in that condemnation?

Q. That is in the Barassa.

A. In the Barassa, now you may be right on that acreage, and, just as I testify, we sold them that, we will put it at seven hundred dollars an acre, but I don't think that acreage is right, but we gave them an easement for a single track road, which we can put them off at any time that we need the ground. We don't agree to give them another right of way. $2,500 is the consideration they paid us.

I gave testimony regarding the value of Barassa tract; I testified that Barassa tract was worth $100 an acre, with the same value for the Martel and Marketti tracts.

Q. And upon what did you base your judgment of $100?

A. I simply thought that the land was low and was not available, under the conditions that then existed, for any—or did I take into consideration the fact, which has developed in the meantime, that those new mines would require land for streets and building purposes; my judgment of $100 an acre which I gave there as my judgment was very quickly upset by a jury of my townsmen.

The Master: What was the date of that?

Mr. Wykes: This was the 13th day of April, 1911. And, in answer to a question of what sales you fixed your value upon,
364 did you not refer to a tract in that neighborhood that you said was purchased of a man by the name of Muck?

A. Yes.

Q. And did you not say that a forty acre tract there was purchased at—I have forgotten what the figure was—a certain figure, what was it?

A. I believe I also testified in the Muck case that we bought a defective title.

Q. You had better see this, before you say that.

A. From Muck? Just a quit claim from Muck, paid him $1,500, as I remember.

Q. What was it you testified with regard to the Muck description?

Mr. Eldredge: Show him the testimony.

Q. You have said that you stated——

A. No, I said I believe I stated.

Q. Now, isn't it a fact that instead of stating, you were approached on cross examination with the idea that this was a defective title that you had purchased, and you said that it was a good title and a title conveyed by warranty deed?

A. No, not from Muck, I couldn't; if I did, I must have been very much mistaken.

Q. Let me read this testimony to you: "Q. Upon what do you base your opinion then when you say that the Barassa property is worth two hundred dollars an acre and the Martel property $100 an acre and the Marketti property at the price you put upon it? A. Prop-

erties that I have bought right adjoining. Q. How long ago? A. Within two years. Q. Where was that piece located?
365 A. Right to the north of the Barassa and Martel lands. Q. How far north? A. Directly adjoining. Q. You bought a tax title? A. We got the title."

A. We got the title, which the court afterwards affirmed. We did have—at that time we didn't buy from Muck. As I remember it, he gave us a warranty deed; of course, we knew Muck wasn't responsible, and couldn't warranty anything.

Q. Let me read a little further. "Q. By whom owned? A. By Charles Muck; we paid a thousand dollars for forty acres. Q. What title did Mr. Muck have to it? A. He had a title which was approved by our counsel. Q. Are you not in litigation on that title at the present time? A. Yes. Q. You brought a lawsuit? A. Well the other fellows brought the lawsuit." Let me read further, and ask if you gave this testimony: "Q. You understand you are basing your testimony on the value of the land as it is today. Now as to the price today considering these values and the circumstances surrounding that land, upon what do you base your opinions? A. Only yesterday we had an offer of forty acres good hay land. Q. Where? A. Two forties east of the Martels on section 34 at one thousand dollars." That is correct, isn't it?

A. Yes.

Q. Did you buy that land?

A. No.

Q. Didn't think it worth a thousand dollars?

A. Couldn't get a title.

Q. You didn't tell that to Mr. Barassa, when he was examining you.

A. No. That was just yesterday, wasn't it, I said there——

Q. Only yesterday.

366 A. That was the offer; then it takes time to look it up, and our counsel wouldn't approve it.

Q. What were those descriptions?

A. Well, I can't tell you now.

Q. Who owned the lands?

A. I can't tell you.

Q. Can you give us the descriptions generally—what part of the section they were in?

A. Just in a general way; that was either the south half of the southeast quarter of 33, as I remember it, or the south half of the southwest quarter of 34.

Q. Do you remember the names of the people?

A. No, I do not.

Q. Was the acreage of this parcel that was sold to the C. & N. W. three acres.

A. As I took it off the copy of the deed this morning, I only made it 1.44.

Q. Here in your testimony you say you figured it six lots to the acre. How did you figure that up? You bought a certain number of lots there?

A. We take a lot, call a lot fifty by a hundred and fifty, 750 square feet to a lot.

Mr. Butler: 7,500.

A. I mean 7,500, and we buy six; that is practically an acre of ground—practically forty-three hundred thousand feet.

Q. From your testimony here, you evidently figured the number of lots there and figured it into acres?

A. Yes, take the lots fifty by a hundred and fifty.

367 Q. And this was very soon after you had had the transaction?

A. Yes, a year or so.

Q. And your recollection of that would have been better at that time than now, wouldn't it?

A. Yes.

Q. Do you remember having stated at that time that there were other lands for sale in the vicinity of Negaunee?

A. Yes.

Q. Whose were those?

A. George Maas and Mitchell.

Q. Where were those lands?

A. They were north of the Maas mine.

Q. And how far this way from the center of town?

Mr. Eldredge: This way?

Q. Wouldn't it be this way?

A. Yes, it would be northeast.

Q. Northeast from the center of Negaunee?

A. Yes, a mile and a half.

Q. Those lands were divided into lots, were they?

A. No, it is acreage property.

Q. You had that for sale, did you?

A. No, had an option on it.

Q. You had an option at the time?

A. Yes.

Q. Were they sold?

A. No, we didn't exercise our option.

[Folio 368 missing.—Printer.]

369 Ishpeming is the surface. The minerals are always reserved.

TOWNSEND.

Cross-examination.

By Mr. Wykes:

In Negaunee, the business part of the town lies north of the right of way, which is the present south limit of the business part of town. The business buildings abut the track there. The sales in the business part on which I based my values are north of the railroad, some abutting the railroad. For four lots on Pioneer Ave., the west side abutting the South Shore track, there has been an offer of $2,500 a lot, 33 x 100 feet. That involved the right to put and maintain

permanent structures on the ground, with a removal clause in case of the finding and necessity of mining iron ore. I don't want to tell who offered that.

Four years ago, I had an option on a lot on the corner of Pioneer and Iron Sts., 50 x 100, for $4,500, for a Y. M. C. A. building. The owner said he was donating $500 to the Y. M. C. A. His estate sold the lot for $4,300 cash, with no structures. Iron is a main business street of the town, and Pioneer is a principal business street. At that time, this lot was four blocks from the postoffice; now it is within a block. We did not take up the option. The lot was sold about 3 years ago, and a concrete block put on it. Our lots are between that and the track, 400 feet. The entire property on those main streets is built up for a considerable distance; starting at the corner of Pioneer and Iron Sts., north, the business part runs about 3 blocks. It does not run farther east than Pioneer St., and runs west, about five blocks, to where the South Shore intersects Iron St.

The new building put on the lot, corner of Pioneer and Iron, cost, perhaps, $15,000. The bank block on Iron St., 1½ blocks
370 west, cost $40,000; the Perkins Block, in the second block from this, cost $30,000; the First National Bank Bldg., two blocks away, cost $40,000. The old bank building, burned, was on the south side of Iron St., next to C. & N. W. main line. After the building burned, the property, with a small lot adjacent, was sold for $13,000, to a new state bank, the land being the equivalent of two lots 50 x 150 feet. The bank did not stay there, because the other side of the street, away from the railroad, is the most desirable.

I also had in mind the sale of some unimproved lots opposite this old bank property, on the south side of Iron St., between Silver St. and the C. & N. W. main line. It was bought 2 years ago, by Winter & Suess, for $2,250. It is about 125 feet on Silver St., and triangular, running from 100 feet in depth to 25. Next to the South Shore track, it is 18 to 20 feet. At the furtherest extremity north, below the surface of Silver St., it is perhaps 8 feet.

I base this value on no other lots that are in that immediate vicinity; there is no property for sale. Those I mentioned constitute the sole basis of my value, as far as actual sales are concerned. With the unfortunate conditions surrounding property in Negaunee, with reference both to dwellings and business places, there is no property for sale. It is not a question of the actual merit as to the value of the property there. If there is property for sale, you can get most anything you want to ask. In the absence of a knowledge of sales, I can form a judgment as to the value of the property only so far as I am in constant touch with people desiring vacant places for residences, stores and offices. My judgment is based on what the property can be sold for.

I based my $18,000 to $22,000 valuation on my general knowledge of the conditions in Negaunee. I took into consideration specific bids and offers, beside the one I mentioned. I considered the
371 offers for these lots between the Mitchell lot and the right of way as bona fide.

On July 21, 1914.

TOWNSEND, Recalled by Plaintiff.

Direct examination.

By Mr. Eldredge:

(Certain testimony of Ralph J. MacKenzie, to the effect that Mr. Townsend had offered to sell certain lands in Negaunee Township to him at $3.25 to $6.00 an acre, read to witness.) Mr. MacKenzie never made an application personally or by letter, to my knowledge, for the purchase or rental of any land. We never made any offer to MacKenzie or anyone else for sale of any land in the Eagle Mills flat or its vicinity. The Cleveland Cliffs Iron Co. owns 400 acres on the Eagle Mills flat, near Eagle Mills, being right around the Eagle Mills connection of L. S. & I. and D. S. S. & A. These lands are located in section 34, 48-26; for several descriptions, we paid $30 an acre, and for the balance $50; they are not for sale.

I never told MacKenzie, in any form, that I would sell any land of Cleveland Cliffs Co. at Eagle Mills, or between there and Goose Lake, or anywhere on Eagle Mills flat, at from $6.50 to $3.50 an acre and be glad to sell them. I had never had conversation with him on the subject of sale or rent. MacKenzie came to my office about a year ago, April 1913, said he was supervisor of Negaunee Township, and asked if we were satisfied with the previous year's assessment; I told him "yes." That conversation did not exceed three minutes, and that was all, relative to lands, that took place, to my recollection.

TOWNSEND.

Cross-examination.

By Mr. Wykes:

MacKenzie never came to see me about any Cleveland Cliffs lands, except this one instance, and nothing was said at that time
372 about the purchase of lands or as to what lands were worth; the lands appear on the assessment roll at from $3.00 to $25.00 per acre.

The 400 acres in section 34 is in part cut by the South Shore, which runs through three forties; and the others lie directly north. It is practically all cleared land, with no timber of value; the company purchased it about five years ago, in two parcels, one at $30, and the other at $50, per acre. One parcel included lands remote from Eagle Mills. The minerals were reserved. A half mile west of Eagle Mills, the Cleveland Cliffs owns a forty, having paid a thousand dollars for it and buying a lawsuit; I previously testified relative to this. It was the Maloney forty. We wanted the Eagle Mills lands for possibly a townsite purpose. The 400 acres run right up to the point

where the lines intersect at Eagle Mills. In the first two miles east from Eagle Mills, the Cleveland Cliffs owns nothing. East of there, along the north track, it owns approximately 200 acres. From two miles east of Eagle Mills, towards Marquette, the Cleveland Cliffs has large holdings; except for flowage rights of a small part, in connection with the Carp River Water Power, they are put to no use at present. The 400 acres at Eagle Mills was assessed for 1913 at $6.25 to $11.25 per acre.

373 On September 30, 1912.

WILLIAM E. MASON, a Witness called by Plaintiff.

Cross-examination.

By Mr. Wykes:

I have been local attorney for South Shore at L'Anse for a considerable time. Values along the road are increasing, and are considerably higher than 5 or 10 years ago.

There is land between red lines on Complt.'s Ex. 10, Riggs, not covered by tracks. The greatest distance between the red lines is about 1,200 feet; at that place, there are three tracks, a roundhouse, old depot grounds and a pole yard. At the lower part, toward the west, it is 1,000 feet between the red lines, and there are two tracks. The railroad uses the land for storage ground for forest products towed in along the old ore dock. The National Pole Co., the Nester Lumber Co. and others use that ground to store lumber, poles and bark, for shipment. I don't know whether they pay rent or not.

The old dock was rebuilt by village, under lease from South Shore. There are no tracks on the new docks, but are on old. To the south of the railroad grounds, on Complt.'s Ex. 10, there is no settlement; it is a forest plateau. I have owned it for a year; I paid $60,000 for entire tract, which consists of 160 acres immediately south of track, 400 or 500 acres of wild land a couple of miles back, from which the timber has been removed, and about 42 vacant village lots. That farther back is fair farming land, worth $15 to $20 an acre. The lots are 50 x 125 feet, and all in settled part of L'Anse; two are down in the flat and the balance on hills where residences are.

The lots are farther away from the settled part than the irregular tract devoted to railroad use. The two lots in the plat are in the business part, a store on one side and county buildings on the
374 other, and are among the best in the city.

There has been a gradual increase in values in Baraga. There has been a rapid increase in farming settlements along this part of the railroad in the last 3 or 4 years.

375 On September 30, 1912.

JOSEPH J. O'CONNOR, a Witness called by Plaintiff.

Direct examination.

By Mr. Eldredge:

The Blankenhorn farm, 60 acres of cleared land, is about 1 mile from the center of town; it sold several years ago for $8,000. Values have increased, and in my judgment it is now worth $10,000.

O'CONNOR.

Cross-examination.

By Mr. Wykes:

All L'Anse property has increased rapidly in value in the last six months. The lot that I spoke of in L'Anse sold for $300, in 1906; its ratio of increase has been 300 to 1,000. In the last year, the increase in general values has been 100% there, and there was a general increase along this strip.

O'CONNOR.

Recross-examination.

By Mr. Wykes:

Land values are increasing rapidly around L'Anse and in Baraga County, and have been for about 5 years. There is a greater demand for lands all through the county. There is more or less settlement and clearing going on all the time.

376 On October 1, 1912.

ARVO J. VITALI, a Witness called by Plaintiff.

Direct examination.

By Mr. Eldredge:

I have lived in Paynesville, Ontonagon County, for 4½ years. I sold out my mercantile business last spring, and am in farming and real estate now; have dealt in real estate for 5 years, both for myself and others. I am familiar with land values along South Shore, Sidnaw to Lake Gogebic, but no farther. I have brought over a hundred families of settlers to Trout Creek, Paynesville and Bruce's Crossing in the last 4 years, handling 4,000 or 5,000 acres.

On January 2, 1914.

VITALI, Recalled by Plaintiff.

Direct examination.

By Mr. Eldredge:

All the land in that territory around Kenton has increased in value in the last year.

Since I testified previously there has been more clearings and settlers. I am putting values as they apply at the present time. All the land along this territory has increased during last summer. It has been put in better shape—better improvements and better cultivated. Values have increased, since I testified before, on account of nearness to Paynesville and increase in the general value of lands, and condition of this particular land. Several houses are being built north and south of this land during the last year, and town has grown to about twice former size.

377 On October 1, 1912.

AUGUST HUTULA, a Witness called by Plaintiff.

Cross-examination.

By Mr. Wykes:

Land prices have been coming up fast.

378 On October 1, 1912.

AUGUST WALLEN, a Witness called by Plaintiff.

Direct examination.

By Mr. Eldredge:

I have lived at Ewen since 1891. In last 12 years, I have handled land and farmed. I have bought and sold 35,000 to 50,000 acres, and own 11,000 in the Upper Peninsula now, mostly in Ontonagon Co.

WALLEN.

Cross-examination.

By Mr. Wykes:

In 1891, they thought 50¢ an acre for cut-over land too high. Since then, there has been a steady increase. From Bruce's Crossing to Bergland, it hasn't gone up in the last 2 years, but east of there it has.

The cost of clearing cut over land is $15 to $60 an acre; $60 is heavy pines stump land or hardwood; that is exceptional, and you can't afford to add the full price to land value. The $15 kind is what has been burnt over, leaving hardwood and pine stumps. Now, there is brush and trees on it. Some of the big fires burned up the surface soil.

On January 3, 1914.

WALLACE, recalled.

Further cross-examination.

By Mr. Wykes:

I am quite familiar with values all through the 37 miles west of Trout Creek and the lands adjacent. Prices in that locality are going up; not so much for some years before as now. I have made more sales to actual settlers this summer than ever before. The prices are double those of 5 years ago, and a year ago they were higher than 4 years before that. There is a gradual rise. That is true all the way — Kenton to Topaz; west of there it is not so. The tim-
379 ber lands 5 years ago were about at the same price as at present. Through this 37 miles, there is more or less clearing and settling; people are moving in, new houses are going up, and the country is improving, in general.

The two miles out of Lake Gogebic, which I now value at $5 an acre, has increased in value since I testified before. It would be earier to sell that land at $5 now than at $4 when I was here before; $1 an acre is increase. Because the settlement is coming from Wakefield, they are building a county road, Tula to Lake Gogebic, opening up that country, the good lands along that line will be all right. I figure no increase in the $8 land I spoke of; there has been some increase in value in everything else—a gradual increase.

380 On October 2, 1912.

JOHN CAMPBELL, a Witness called by Plaintiff.

Direct examination.

By Mr. Eldredge:

I have lived at L'Anse 40 years. I have been in merchandising business all my life; have dealt some in real estate. I know the value of property in L'Anse and Baraga county.

CAMPBELL.

Cross-examination.

By Mr. Wykes:

Everything is on the raise in L'Anse and toward Keweenaw Bay.

381 On October 2, 1912.

ADOLPH W. PETERSON, a Witness called by Plaintiff.

Direct examination.

By Mr. Eldredge:

I have been in real estate and insurance business at Ironwood, Gogebic county, 17 years. I am familiar with lands along South Shore in that county.

PETERSON.

Cross-examination.

By Mr. Wykes:

In last 10 years, land values have gone up greatly, and timber values some. The farming industry is just developing, and proximity to Ironwood helped raise values. The increase in price of land along railroad has been general and gradual throughout this country.

382 On October 2, 1912.

JEROME BROWN, a Witness called by Plaintiff.

Direct examination.

By Mr. Eldredge:

I have lived at Matchwood 25 years—since 1887. They were then cutting the timber from the right of way and building South Shore. I first homesteaded some land, then logged 10 years, and since have farmed. Have owned 1,000 to 2,000 acres in Upper Peninsula. I was familiar with original character of land where railroad is; it was all mixed timber land. That was true from state line to Nestoria, except a small portion near Vermilac.

383 On October 3, 1912.

H. S. THOMPSON, a witness called by plaintiff.

Direct examination.

By Mr. Eldredge:

I live at Beacon, in the same locality as Champion. The former is the mine postoffice and the latter the station postoffice. I am assistant superintendent of the Oliver Iron Mining Co., in charge of Champion mine; have lived there 6 years, and am familiar with the property of South Shore.

For ½ mile each side of the station at Champion, the average value of right of way, simply as land, is $300 an acre, provided village remains as it is. The right of way (¾ mile) of the mine track into Bacon, serving Champion mine, is worth $60 an acre, simply as land, provided the village stays there.

From ½ mile east of Champion to Humboldt, land along right of way is worth from nothing to $15 an acre, simply for surface rights. Considering mineral rights, it is worth $100 an acre, though it has not been explored successfully. An absolute right of way in fee greatly impairs mineral value. In a hard ore formation, it would be necessary to leave a strip 1,100 feet wide to support a 100 foot right of way. A soft ore formation would not require so wide a strip.

From Champion to Michigamme, the right of way is worth $100 an acre, speculative value, straight through, as the first 3 miles west of Champion is in Michigamme slate formation and balance is in Ishpeming and Negaunee formation.

384 THOMPSON.

Cross-examination.

By Mr. Wykes:

Caving distance given simply referred to our mine, but I don't think it is general. Around Ishpeming, they are mining under railroad tracks in a small way. They are driving drifts and tunnels under, but not mining out a big room. The character of mining possible, and the distance from the track, depends on nature of the ore. There is no absolute rule. It depends on the depth of mining, whether the formation is vertical or perpendicular, and the strata of earth over the ore.

The ½ mile each side of Champion would not be worth $300, if not located in a village of 700. There is no plat; it is just an unrecorded map made by the mining company. The ½ mile each way would go beyond the edges of the settlement, as houses do not cover over ¾ of a mile.

Champion to Humboldt, ¾ of the land contiguous to South Shore is available for farming, and the other ¼ is swamp. It is worth from nothing to $15 an acre average; close to $15. There are no improvements of settlers there, close to the tracks. The soil is light and sandy, generally, though there is some good loam on the north side. You could clear that land for $40, and that would make it cost $55, which would be a good price for it. The iron formation in that section is in a basin of varying widths, and the space between the two formations at Champion carries possibilities. I fix the $100 valuation on the chance of discovery of ore. In my 6 years at Champion, I haven't known of any prospecting along South Shore, Champion to Humboldt, except within ½ mile of Humboldt, where the Breitungs have been drilling. I don't know of any sales along South Shore. Those lands are largely owned by corporations.

385 In 1905, land in sections 28 and 29, 48-29, sold for about

$100 an acre. I am not sure whether that was the same land that sold for $60 in section 29 or not, but it probably was not.

Right of way, Champion to Humboldt, is in the mineral formation. Only part of N. ½ of section 9-47-29 is in the formation. Neither the N. E. of S. E. nor N. W. of S. E. of 9 is in formation. The N. ½ of section 10-47-29 is in the formation, but the W. ½ of the S. E. ¼ of 10 is not, nor is section 28-47-29. Sections 28 and 29 of 48-29 are affected.

Champion to Michigamme is 8 miles. The first 3 miles is flat pine plains; after that it is rocky. That 8 miles is worth $8 an acre, average, for land, without reference to mineral value. Considering mineral possibility, it is worth $100 an acre. The Oliver Iron Mining Co. drilled on the odd sections through there, last March, but I don't know the results. Mineral possibilities would be on sections 30 and 31, 48-20. The last drilling was on section 21.

The purchase I spoke of, averaging $100 an acre, was the mineral rights on 4 forties, and the fee to 90 acres. Consideration was $15,500.

The Oliver Iron Mining Co. has large holdings through here, and Champion Iron Co. owns all of section 31-48-29, except the right of way of railroads; also most of sections 32 and 33. The Oliver Co. is the operating company; the Champion Co. is in the steel trust. I think these lands have a speculative value of $100 an acre, but do not think they should be taxed at that, as assessor cannot see that value.

386 I would sell the mineral and fee for $110, if I owned them, but it is a broad question when you ask whether I would pay that much. The value is sufficiently tangible so that I would ask that much for them, but not to be put on the assessment roll at that.

UNITED STATES OF AMERICA,
Eastern District of Michigan, ss:

I, Elmer W. Voorheis, Clerk of the District Court of the United States for the Eastern District of Michigan, do hereby certify that the above and foregoing is a true copy of Volume 1 of Narrative Statement of Testimony on Appeal, comprising typewritten pages numbered one to three hundred and eighty-six inclusive with a preface of nineteen typewritten pages embodying written notices, affidavits of service, designation of contents of appeal record, original exhibits to be returned and court's order in the therein entitled cause as the same appears on file and of record in my office; that I have compared the same with the original, and it is a true and correct transcript therefrom and of the whole thereof.

In testimony whereof, I have hereunto set my hand and affixed the seal of said Court, at Detroit, in said district, this twenty-first day of November, in the year of our Lord one thousand nine hundred and eighteen, and of the Independence of the United States of America the one hundred and forty-third.

[Seal of the U. S. District Court, Eastern District of Mich.]

ELMER W. VOORHEIS, *Clerk.*

387

Vol. 2.

On October 4, 1912.

A. E. DELF, a witness for the Plaintiff.

Direct examination.

By Mr. Butler:

I am Auditor of complainant. I have been employed by it since its organization in 1887, at the time of its organization as Chief Clerk in the Auditor's office; since 1894, as Auditor in chief charge of the accounts. I am and have been familiar with its accounts. They are kept in accordance with the rules and regulations of the Interstate Commerce Commission.

(Exhibits 25 to 30 inclusive, are various I. C. C. classifications, which are produced and introduced.)

(Complt.'s Ex. 31, Delf, showing road owned and operated by complainant, by years 1910-1912, produced and offered in evidence.)

(Complt.'s Ex. 32, Delf, showing revenue locomotive mileage by years 1910-1912, produced and introduced.) This is correct and the records, from which it is made, were kept in the regular course of business as prescribed by the I. C. C.)

(Complt.'s Ex. 33, Delf, being its revenue train mileage, 1910-1912, produced and introduced in evidence.) This exhibit is made from books, records, and papers kept in accordance with I. C. C. classification. The mileage of mixed trains is apportioned, 75% to freight and 25% to passenger regardless of number of cars or quantity of business in each class.

So far as my communications with other railroads have gone it is the general custom to divide, 25% to passenger and 75% to freight. I have made no special inquiry, but in my railroad experience these things have come up. The I. C. C. makes rulings upon its classifications; they are bound and published.

(Complt.'s Ex. 34, Delf, showing revenue and non-revenue passenger and freight car mileage, sub-divided, 1910-1912, produced and introduced in evidence.)

388 (Complt.'s Ex. 35, Delf, showing operating revenues 1910, 1911 and 1912, produced and introduced in evidence.)

(Complt.'s Ex. 36, Delf, divisions of operating revenues in Michigan as assigned by Complt.'s Ex. 35, between freight and passenger departments in Michigan for 1910, 1911 and 1912, produced and introduced in evidence.)

(Complt.'s Ex. 37, Delf, giving routes and compensation for hauling mail, July 1, 1907, to July 1, 1911, and from July 1, 1911, produced and introduced in evidence, later amended.)

Mixed train mileage: The division was 75% freight, 25% passenger. From 1894 to 1899 the I. C. C. on their blanks for report directed us to divide in that way. The commission has given no

instructions on the subject since 1899 that I know of. Accounting bulletin No. 8, of I. C. C. effective July 1, 1912, Case 102, Query:

"The classification of locomotive miles, car miles and train miles, makes no provision for the division of mixed train miles, between passenger and freight. Upon what basis should this division be made?

A. No. division between passenger and freight has been prescribed for mixed train miles."

(Complt.'s Ex. 38, Delf. Operating expenses of complainant for fiscal years ending June 30, 1910, 1911 and 1912, produced and offered in evidence.)

(Complt.'s Exs. 39 and 40, Delf, its reports to stock-holders for years June 30, 1911 and 1912, produced and introduced in evidence.)

There is no division between states in Complt.'s Exs. 39 and 40, Delf.

(Complt.'s Ex. 41, Delf, a statement of the method used in
389 dividing operating expenses between states and method of apportionment of Michigan proportion of expenses to passenger and freight business.) This is a statement of method and not of detailed figures, and the purpose is to determine the portion of operating expenses to be assigned to Michigan and to divide the Michigan proportion between the passenger and feight departments. (The Exhibits introduced in evidence.)

Lower half of Complt.'s Ex. 38, Delf, indicates the result of the application of the division of operating expenses between Michigan and the rest of the line as indicated on Complt.'s Ex. 41, under "method of division between states."

The percentages on Complt.'s Ex. 41, Delf, were applicable to the year ending June 30, 1910; the same method was used for all three years, the percentages, however, might vary somewhat depending upon the business of the various years.

Neither the I. C. C. or Michigan, requires a separation of expenses between states and neither prescribes a method for doing so. Minnesota, the only public authority requiring such division, instructed us to divide all operating expenses between states on a train mileage basis. They commenced a short time ago; I am not sure that they still adhere to it. I do not know to what use they put this assignment.

In 1910, 84.32% of the expense assigned to Michigan was allocated.

		Mich.	Wis.	Minn.
1910	Allocated	$1,612,717	$278,000	$20,554
1910	Assigned	299,847	57,495	594
1910	Assigned and allocated	1,912,564	335,525	21,148
1911	Allocated	1,591,937	288,679	10,919
1911	Assigned	312,301	64,866	636
1911	Assigned and allocated	1,904,238	353,545	11,555
1912	Allocated	1,671,596	320,367	7,699
1912	Assigned	326,317	68,539	640
1912	Assigned and allocated	1,997,913	388,906	8,339

390 The percentages allocated to Michigan were: 1910, 84.32%, 1911, 83.60%, 1912, 83.67%.

Complt.'s Ex. 41, Delf, also indicates the method by which the operating expenses apportioned to Michigan, are divided between freight and passenger business.

For the items divided on the basis of Michigan revenue train miles, I believe that is a fair and just method of making the division.

Since 1893 or 1894, the complainant has made a division of operating expenses between passenger and freight.

The purpose was to ascertain what we were doing in our freight and passenger business, as near as we could—the profit or loss. We only applied it to the traffic items at that time, we did not bring into it taxes, rentals and things of that kind.

The operating expenses were kept in accordance with the I. C. C. classification. I believe some classification of operating expenses by I. C. C. has been in effect since July 1, 1894.

The Interstate Commerce Commission required us to divide operating expenses between passenger and freight until in 1894, but since that time they have not required the division. During the time they required the division between freight and passenger they, by general instructions, prescribed a method for the division.

The method, generally speaking, was the revenue train mile basis used for the division of common expenses, and was the only one ever prescribed by any public authority so far as I know; the I. C. C. ceased to require it in 1894. I believe, however, the railroads have since, for their own purposes and information, continued to make such division. Our company has so continued.

In the operation of our railroad, passenger trains have precedence
on the right of way over freight trains. Freight trains are
391 required to side track and wait until the passenger trains
go by. The freight train is heavier and has more cars on the average, while the passenger train is faster. The outer rail is raised on the curves to accommodate the faster speed of the passenger trains, which adds to the safety of the track and is not necessary to the same extent for the slower trains.

Considerable company freight called "non-revenue freight" is transported over the road for the maintenance and operation of the property. No account is kept of the cost of hauling that business which is for the common benefit of both departments, but hauled by freight trains. No part of it is included in items allocated to the passenger department. It is hauled on regular freight trains more or less at all times through the year. Whatever the cost is, it is allocated to the freight business. No record has been kept and I cannot give any opinion as to the tonnage or amount. We could approximate the car loads—that would be all.

The greater part of the expenditure for operating expenses in the maintenance of way and structures account, is made necessary by causes other than wear — by weather.

For rails, the larger amount is due to wear and the less is due to weather; on such items as buildings, fixtures, water tanks, stations, platforms, wooden buildings, and structures along and in the track a considerable portion of the expenditure is due to weather and a por-

tion to wear. On items, such as fences, roofs of buildings, water tanks, etc., there is none due to wear.

I know of no way to determine the proportion of common expenses included in the general account "maintenance of way and structures," which is due to wear and which is due to other causes. Engi-
392 neers have attempted a method for making the division between wear and weather. I do not know whether they have discovered a method or not. A division has been made or assumed; I don't know how they got at the percentage assigned to weather.

Under the transportation expense account, the primary accounts, yardmasters and their clerks, yard conductors and brakemen, yard switch and signal tenders, yard supplies, expenses, yard enginemen, engine house expenses, yard, fuel for yards locomotives, water for yard locomotives, are all divided on the basis of ten per cent to freight.

That factor of division has been used by our company since 1893 or 1894, and I think fairly represents the proportion chargeable to each class of service. It is an estimate arrived at by consultation with operating officials, based upon their judgment. It would be difficult to arrive at division that is demonstratably correct—I think it would be quite impossible. The same crews, equipment and facilities do both classes of switching.

The following percentages of total Michigan operating expenses were allocated between freight and passenger: 1910, 68.76%; 1911, 69.74%; 1912, 68.65%. The amounts not allocated were assigned.

	Passenger.	Freight.
1910	47.74%	52.53%
1911	.....	.....
1912	.....	.....

(Complt.'s Ex. 42, Delf, showing tonnage statistics, produced and offered in evidence.)

Complt.'s Ex. 42, Delf, includes only freight hauled under tariffs for pay. During the last fiscal year (ending June 30, 1912), we kept separately the interstate and intrastate freight business statistics in Michigan; previously we did not separate them. The facts
393 are clearly stated on Complt.'s Ex. 42, Delf. In keeping separate the intrastate freight statistics, it is necessary to consider each way bill, and at times the items on each way bill separately.

Both classes may be on the same way bill and both classes—inter and intra state freight—are in the same train and in the same car.

I believe from the general character of the business that the relation between the intrastate and interstate freight business in Michigan is fairly constant from year to year, and that the relation of each to the total would be substantially the same in Michigan.

(Complt.'s Ex. 43, Delf, showing passenger statistics in Michigan, produced, and offered in evidence.) This exhibit was made up by me and under my instruction, and is true and correct.

In the case of interstate passengers moving partly within and partly without Michigan, the mileage assigned to Michigan is the

actual travel of each passenger in the state. For fiscal year 1912, we have kept the division of Michigan business between intrastate and interstate passenger business separately. The figures for 1910, 1911 and 1912, shown on Complt.'s Ex. 43, Delf, we worked up separately. The figures shown are the actual figures as to the things purported to be shown.

(Complt.'s Ex. 44, Delf, showing freight statistics of complainant, produced, and offered in evidence.)

Ore hauled to complainant's docks is all destined and billed to points outside Michigan by water; our haul is entirely within the state. Our charge is only made to our docks wherever it goes. This business though handled on a local rate is in fact interstate business.

394 Complainant hauls iron ore from the Ishpeming and Negaunee district to points other than the docks at Marquette (E. G. Newberry, Mancelona, Cadillac, and Elk Rapids, Michigan), that I have classified as intrastate freight. We also haul some iron ore by rail to points in other states; that is classified as interstate freight. The only iron ore classified as such on Complt.'s Ex. 44, Delf, is that hauled from the Ishpeming and Negaunee district to the ore docks at Marquette, classified by me as interstate commerce. Other interstate iron ore is included in other interstate statistics of Complt.'s Ex. 44, Delf, but not separated as between commodities. Nothing is done with the ore at Marquette except to transfer it from the cars to boats by means of the dock.

(Complt.'s Exs. 45, 47 and 48, Delf, showing gross and net operating revenues, operating expenses, etc., in 1910, 1911 and 1912 respectively, produced and offered in evidence.)

The statements (Complt.'s Exs. 45, 47 and 48, Delf) are made in accordance with the I. C. C. classification as to definition of items, from data regularly kept and they are true and correct. Revenue and expenses are divided between freight and passenger, according to exhibits heretofore introduced in evidence in connection with my testimony. Hire of equipment, interest, joint facilities, taxes, rents paid (joint facilities), rents paid (miscellaneous) and separately operated properties (Mackinaw Trans. Co.), are divided between freight and passenger on the basis of income, which is for 1910, 66.90% freight, and 33.01% passenger.

In arriving at the estimated loss by the application of Act 276, of $178,234.21, I estimated that the loss on that class of business in 1910, would be the difference between the rate of 2.563¢ and 2¢ or 5.63 mills per passenger mile. I estimated there would be no greater amount of traffic under the two than under the three cent

395 rate.

For the exception of travel of distances of 5 miles or less where three cents may be charged, I made figures for 1912; the number of passengers 5 miles or less for year ending June 30, 1912, was 56,541, the revenue was $5,477.35, and the one-third excess over two cents a mile was $1,825.78.

To offset this amount I have made figures for children traveling at half fare based on two months' business, Dec. 1911 and June 1912. This applied to the year 1912 indicates an aggregate reduction below two cents per mile amounting to $1,821.33 on entire business, $1,-324.31 on intrastate and $498.22 on interstate business.

Referring to Complt.'s Ex. 43, Delf, showing the average haul on intrastate passengers for 1910 to be 31.18 miles, and average revenue per passenger per mile to be 25.63 miles; the saving to the passenger by the two cent rate would have been 5.63 mills on each mile travelled or 17.5 cents per passenger in 1910 and about the same in 1911 and 1912.

In the passenger mile statistics I have given, children's half fare travel is treated as full passenger miles without distinction between full and half fares. Persons travelling on passes are not included. In arriving at the average amount per passenger I divided the total revenue received for transportation of persons by the total passenger miles arrived at as described.

Leaving out the trips of five miles or less it would be impossible to get an average of two cents per mile if any children travelled at half fare. In arriving at the average haul, interstate passengers for 1910, 143.46 miles, average revenue per passenger mile 25.18 mills, for 1912, 128.79 miles, revenue per passenger mile 24.58 mills, 396 the passenger miles include only miles actually travelled in Michigan. If the entire interstate haul had been taken, the average haul of interstate passengers would be higher than stated on Complt.'s Ex. 43, Delf.

Revenue from passengers (page 3, Complt.'s Ex. 45, Delf) includes intrastate and interstate, actually arrived at.

Excess baggage, mail, express and other passenger train revenue, special train revenue, station and train privileges, telegraph service, rent of buildings and other property, miscellaneous, joint facilities (Bal. cr.) outside operations (sleeping and dining cars), hire of equipment, interest, rents received, joint facilities and miscellaneous income, were all treated as common and separated to inter and intrastate passenger on a percentage relation of revenue from passengers for 1910, of 56.39% to intrastate and 43.61% to interstate.

The passenger operating expenses were equated at 115%. That means it is assumed that it costs 15% more to do the intrastate passenger business than to do the interstate passenger business.

Complt.'s Ex. 46, Delf, shows the method of dividing on the equated passenger mile basis. This method is as follows:

"You take the intrastate passenger miles and increase it by 15%, and take the interstate passenger miles as they are, without increase; you add the interstate passenger miles so increased to the interstate passenger mile and take a total and then ascertain the percentage of intrastate passenger miles so equated to the total, and of the interstate passenger miles to the total, to such total, equated total, and then apply those percentages to the total passenger operating expenses in the State, for the figures which are shown on the third sheet of Complt.'s Ex. 45, Delf."

397 The taxes, rents paid (joint facilities, miscellaneous and separately operated properties) were divided on the revenue basis of 56.39% intrastate and 43.61% interstate.

They are then added to the operating expenses and the total deducted from the gross passenger income showing total net income for 1910 of $270,097.49; intrastate net income $134,118.35; and interstate net income $135,979.14. Deducting the estimated loss of $178,234.14, leaves for the whole passenger business in Michigan $91,663.28, and deducting the estimated loss on intrastate and interstate business from intrastate and interstate net income, leaves $30,757.42, as net income of intrastate business, and $61,105.86, as net income from interstate business, after allowing for the estimated loss. (Objection to testimony as to loss, on the ground that it is purely speculative, and assumes that the traffic would remain the same under the reduced rates, which is assuming a condition without precedent and which cannot exist.)

On Jan. 8, 1913.

DELF, recalled.

Direct examination resumed.

By Mr. Butler:

(Complt.'s Ex. 52, Delf, showing estimated loss due to the two cent passenger fare, produced and offered in evidence.)
Complt.'s Exs. 45, 47 and 48, Delf and re-dividing certain items Complt.'s Exss. 45, 47 and 48, Delf, and re-dividing certain items listed therein, between freight and passenger business on different bases than in original exhibits, produced and offered in evidence.)

Item: Outside Operations (sleeping and dining cars $5,606.54) Complt.'s Ex. 45, Delf, is a net item. The details are:

398

1910.	Revenue.	Expense.	Net.
Sleeping Car	$25,803.21	$14,060.06	$11,743.15
Dining Car	26,365.35	32,501.96	-6,136.61
Total	$52,168.56	$46,562.02	$5,606.54
1911.			
Sleeping Car	26,262.23	14,548.14	11,714.09
Dining Car	28,095.75	33,473.62	-5,377.87
Total	54,357.98	48,021.76	6,336.22
1912.			
Sleeping Car	26,685.83	17,506.87	9,178.96
Dining Car	29,908.08	37,673.56	-7,765.48
Total	56,593.91	55,180.43	1,413.48

There was a great deal more expense in repair of sleeping cars in 1912, and sleeping and dining car expenses increased.

(The Complt.'s Ex. 53, Delf, being Railroad and Census Statistics for the Upper Peninsula for 1910, produced and introduced. Complt.'s Ex. 54, Delf, being a statement of operations and of resources and disposition, 1887 to 1912, produced and offered in evidence.)

The D. S. S. & A. commenced operating a railroad Jan. 1, 1887. I have been in the accounting department since its organization, in charge since 1894.

Column, "gross earnings" includes only operating earnings according to I. C. C. reports prior to 1908 and to classification 1908 to 1912, except that revenue from sleeping and dining cars is included. The column does not represent exactly the same thing all the way through, but very closely the same. It corresponds with the requirements of I. C. C. in force at different times.

Column "operating expenses," prior to 1908, included rentals of equipment, which are since included in "other deductions from income." That column is set up in accordance with the
399 I. C. C. classification at the time, except the inclusion of expenses of sleeping and dining cars as noted.

Column "other income" is made up of rentals received, dividends and miscellaneous items, being all receipts from sources other than income.

Column "total income" is sum of "net earnings" and "other income" and is total from all sources, less operating expenses.

Column "taxes accrued" is taxes actually paid, except for fiscal year 1912, where amount is estimated from previous years' taxes.

Column "interest on bonds" is interest accrued.

Column "other deductions from income," 1887 to 1880 all payments were dividends of M. H. & O. stock guaranteed by complainant. These dividends ceased in 1890 when complainant purchased the M. H. & O. 1891 to 1907 the payments were largely interest on unfunded debt, on car trusts and miscellaneous; 1908 to 1912 the amount was in accordance with I. C. C. classification, consisting of interest on unfunded debt, car trust, miscellaneous interest, rentals, separately operated properties, expenses of Mackinaw Trans. Co., company's bad accounts written off, loss on track and buildings abandoned and depreciation that accrued prior to July 1, 1908, on equipment destroyed in current period.

In each instance the depreciation was that which accrued prior to July 1, 1908, but was not charged off until the equipment on which it had accrued was put out of service.

Prior to Jan. 1, 1887, the existing lines of railroad now owned by South Shore were Mackinac and Marquette, successor to Detroit, Mackinac and Marquette, for the line St. Ignace to Marquette, and constructing or about to construct Soo Junction to Soo, the Sault Ste. Marie and Marquette, the Wisconsin, Sault Ste. Marie and
400 Mackinac and the Duluth, Superior and Michigan Railways. I do not believe the latter three had any line. Our records

give no information with regard to them. Our company did not become possessed of the records of the companies to which it succeeded; we haven't the construction records, accounts showing cost of road, or anything of that sort. In 1887 upon organization the D. S. S. & A. leased the M. H. & O. whose line extended Marquette to Houghton. The roads thus consolidated and leased formed a line from Sault Ste. Marie and St. Ignace to West Superior, Wisconsin, and from Nestoria to Houghton, as finally completed.

In 1890, the lease from the M. H. & O. to D. S. S. & A. terminated when the D. S. S. & A. purchased all the property of the M. H. & O. including the stock of the Marquette and Western road, Marquette to Ishpeming. This was done through purchase of M. H. & O. stock; that corporation still exists.

There was an intermediate organization—the D. S. S. & A. syndicate—which collected the property together and transferred it by articles of consolidation to the D. S. S. & A.

These other companies, though they didn't build any road, had some land grants on conditions or something of that sort. The D. S. S. & A. became possessed of certain granted lands other than those used for operation, in substantial quantity, through purchase of the M. H. & O. It has disposed of some lands and still has some. The proceeds of land disposed of appear on sheet 1, Complt.'s Ex. 54, Delf, in column "other income." There are some substantial amounts in 1909, $146,000; 1911, $249,000. Of the latter amount $193,507.82 is proceeds of the sale of those lands.

The larger part of the 1909 amount was dividends from Western Express Co. stock formerly owned by complainant, but now sold.

I have not the details of the items 1909 to 1912 "other in-
401 come"; they don't show in our books, they are made up of numerous items.

Capital stock of $22,000,000 was issued about the time of complainant's organization. $22,000,000 of stock and $4,000,000 of 5% first mortgage bonds were given for the road as it stood in 1887—the consolidated property, that east of Marquette and some west of Nestoria, which was under construction. It was being built by the D. S. S. & A. Syndicate—Calvin Bryce, Hugh McMillan and I think James McMillan and others were interested.

The consolidated mortgage 4% bonds $15,107,000, were authorized at one time and issued at various times.

The times of sale and prices were as follows:

Date.	Amount sold.	Price.
Dec., 1892	$11,000,000	82½
May, 1893	1,067,000	82½
June, 1893	533,000	82½
	12,600,000	10,395,000

Dec. 1892, $2,000,000 delivered to C. P. R. in consideration of its guaranteeing interest on entire issue. January, 1895, $323,000 issued to retire M. H. & O. 6% bonds for same amount. December, 1896, $53,000 issued to retire D. S. S. & A. 5% bonds for same

amount. September, 1897, $78,000, issued to retire D. S. S. & A. bonds, same amount. November, 1897, $53,000, issued to retire D. S. S. & A. 5% bonds same amount. Total $15,107,000. Total $15,107,000 now outstanding.

The D. S. S. & A. 5's retired ($184,000) are a deduction from the total amount of the issue $4,000,000.

M. H. & O. bonds $4,856,700, were first mortgage bonds outstanding when complainant purchased the road. Some of them ($1,077,000) are still outstanding. Income certificates $3,-
402 000,000 4's, issued Dec. 31, 1892, to retire other obligations. No interest has ever been paid on these—they are obligations outstanding. There is no interest to be paid on them unless it was earned over and above other interest. Car trust obligations represent equipment notes. Total income: the caption "Disposition" shows what was done with the resources.

Item, road and equipment, $47,182,526, is the total amount in securities of the company paid for the road and includes additions, betterments and extensions.

The reserve for accrued depreciation in amounts charges to operating expenses to cover depreciation on equipment and ore docks.

The South Shore Land Co. stock is $3,000 all owned by complainant; it owns the lands on hand of the old land grant, and being sold from time to time; that company is managed by officers of complainant.

For six years prior to 1910 the D. S. S. & A. ran its through trains from Houghton to Calumet—through passenger trains, and also some through freight trains from Houghton to Calumet, over the Mineral Range Railroad, and charged the Mineral Range railroad a rental for the equipment, locomotives and cars which constituted the trains, and the latter part of 1909 and the early part of 1910, the Mineral Range Railroad Company protested against that, claimed that it was an injustice to them to charge them that rental, that they didn't get a dollar back for what they were required to pay, and the D. S. S. & A. railroad company agreed with them—agreed to refund the six years rental that had been charged them on that equipment.

403 "The Master: Was that a gratuity; were they under any obligation to refund it?

A. No, except that it was an injustice to charge it in the first place, it was so considered by the officials of both companies."

In addition to that rental the Mineral Range paid part of the operating expenses of the trains. The South Shore owns 53% of the Mineral Range stock. The officers of both companies are practically the same. The minority stockholders raised the question as to whether these payments of rental of equipment were right, and the refund for those 6 years, aggregated $48,399.44. The amount of refund appears in column 8, "other deductions from income, 1910," no part of it was included in operating expenses.

Loss on tracks and buildings abandoned. This appears in "other deductions from income," 1910, 1911 and 1912.

Depreciation prior to June 1, 1907, appears in "other deductions from income."

First mortgage 5% bonds retired, appears in item $15,107,000 M. H. & O. bonds retired. Appears in same item under "resources."

Car trust obligations retired, appears in same item under "resources."

I have not seen complainant's bonds listed in Market reports for a long time. The interest has been regularly paid on M. H. & O. bonds and first mortgage 5% bonds. Interest on consolidated mortgage 4 per cent bonds is in default. I think there was a small payment in 1912. The record shows. Paid interest 1887 to 1912 by years, a total of $12,631,201.90. The interest was paid in full 1887 to 1891. Since that time there has been default of interest each year.

404 I believe the M. H. & O. bonds, first mortgage 5's outstanding are held generally by the public. The consolidated mortgage 4's are all held by C. P. R.

In 1892, $2,000,000 of this issue was given C. P. R. in consideration of its guaranteeing the interest on the entire issue. In 1912 we paid $100,000, and in 1911, $150,000, and in 1910 nothing as interest on consolidated mortgage 4's. I have not the records back of that.

The majority—about 51%—of complainant's stock is held by C. P. R. I don't know where the rest is held.

(Complt.'s Exs. 35*a*, and 36*a*, Delf, being joint facility items, 1910-1912, produced and offered in evidence.)

(Complt.'s Ex. 55, Delf, being operating income and maintenance, and tabulation of operating expenses and taxes of various railroads for various years, produced and offered in evidence.)

I am familiar with the trackage of complainant in Michigan allocated by Riggs as freight tracks on which freight trains alone move, and the yard tracks in Michigan on which both freight and passenger switching is done. I have given attention to the relative cost of maintenance, of such freight and yard tracks and the cost of maintenance of other tracks, principally main line.

From inquiries of the general superintendent and road masters, it does not cost over one-third as much per mile to maintain those tracks as it does to maintain main line tracks. (Objection to the testimony as hearsay.) Independent of inquiry, I know it does not cost as much to maintain those tracks—there is very little maintenance put on them.

In my opinion, independent of inquiry, it does not cost over one-third as much per mile. The accounts do not show the
405 difference in cost. The freight branches and side tracks are not maintained to the same standard that main line tracks are; the use, especially of exclusive freight tracks, is not nearly so great. It would be difficult to state the proportion of use. Different tracks have different degrees of use. This is true also of main line. The traffic is more dense on parts of the main line than on others. Freight tracks to serve mines while used occasionally during the

season of closed navigation, are subject to relatively small use during four or five months, which makes a great deal of difference in maintenance.

DELF.

Cross-examination.

By Mr. Wykes:

In my opinion, Mr. Riggs was wrong when he stated that the degree of maintenance on some mine tracks, spurs and branches, to mines, was as good as on main line. I have been over the tracks more or less, but not for the purpose of inspecting them; I have lived among them all my life and from general observation, know their condition and how they compare with main line.

I have had no experience in maintenance department; I was in the station service for some years; my business has been confined to accounting for 25 or 30 years. I cannot separate the accounts so as to say what money is spent on a particular spur; we do not do it. The passing track is not maintained in as high a state of efficiency as the main line which is used by both services—passenger and freight. Sidings in common use—freight and passenger—would be maintained in the same state of efficiency as those exclusively freight.

There is no way to give separately the income from property used exclusively for freight, and I have no judgment as to the proportion that the income would bear to that of the system as a
406 whole. The freight charge covers the entire service. The mines are classified in to two districts, all in a single district having the same rate.

The mines in a particular district are of varying distances from the main line. The furtherest mine in the Ishpeming and Negaunee district is at least one and a half mile- from the main line and gets the same rate as mines located close to the track.

In selecting the roads for Complt.'s Ex. 55, Delf, I considered that they were roads to a great extent in about the same territory and operating under similar conditions, as complainant. There are other roads other than complainant's in the Upper Peninsula, but I could not get complete reports of all of them; I included no road in Michigan other than complainant and the Wabash.

I do not know even in a general way, what other roads show.

Annual reports are not all compiled in the same way, and the figures in the report, of one road, would mean one thing and in the report of another road another, and to put them together in comparison wouldn't be a proper comparison so I took the reports that were made up in about the same form to make this report from. I tried to get some other roads into this but I was obliged to drop them.

Complainant's capital stock $22,000,000, and bonds $4,000,000, were the consideration for purchase of the railroads at the time of D. S. S. & A. consolidation in 1887. I don't know the value of these. The item "road and equipment $47,000,000 is a price for

the road fixed by the amount of capital stock and bonds then issued, rather than the value. I do not know that C. P. R. paid for this stock. (Complt.'s articles of consolidation produced and marked Defts.' Ex. 12.)

407 The D. M. & M. was a land grant road. My understanding is none of its lands went to consolidated company; I think separate land company was organized and the lands retained by it. Complainant acquired M. H. & O. in 1890, by acquiring almost the entire capital stock; I understand the M. H. & O. still holds regular annual meetings.

In July, 1890, lease from the M. H. & O. to the D. S. S. & A. was abrogated, and at the same time the D. S. S. & A. purchased all the property of the M. H. & O. including all the stock of a road called the Marquette & Western railroad running from Marquette to Ishpeming. When the South Shore acquired the M. H. & O. the stockholders of the M. H. & O. authorized its officers to transfer the road to the South Shore on certain terms, which included the assumption by the South Shore of all the debts of the M. H. & O. Company and an agreement by which for each share of preferred and common stock, the holders thereof were to receive, if applied for within a certain time, a certain sum in cash.

In 1890 at the time it was acquired by the South Shore the M. H. & O. still owned its land grant lands and they came to South Shore. Later the South Shore Land Co., with $3,000 capital stock, was organized in 1898, and the lands deeded to it. The officers of that company are practically the same as the officers of South Shore and the proceeds of land sales from time to time are carried into South Shore accounts. Complainant owns all the South Shore Land Co.'s stock. At the time the M. H. & O. was taken over by complainant, the land grant lands left were about 87,000 acres. The net income, from that time to the present, has been about $193,000. The complainant held the lands 8 years at least, I think it has sold some directly, at least it has sold some timber. The amounts re-

408 ceived for that would be in addition to the sum already stated. The figure $193,000 referred to the South Shore Land Co. operations. In the neighborhood of 70,000 acres of land might still be remaining.

Complt.'s Ex. 53, is taken from population of the entire Upper Peninsula, much territory in the Upper Peninsula is not tributary to the South Shore. The principal cities of the Upper Peninsula are Sault Ste. Marie, Marquette, Negaunee, Ishpeming and Houghton on South Shore line and Calument, Escanaba, Gladstone, Manistique and Iron River, not on South Shore line. It is not possible to say just what territory is tributary to South Shore and what is not. If I had taken the counties through which the South Shore runs, it would have produced different figures from those on Complt.'s Ex. 53. The towns named are reached by different railroads.

In Complt.'s Ex. 52, Delf, in figuring the loss due to two cent rates, I have assumed each year the same business as was actually done, and that the rates would go to a flat two cents.

The dining car service shows a loss for 1910, 1911 and 1912. The dining cars are owned by the South Shore, being (1910) two diners and two or three combination cars. The combination cars have chairs with an extra charge for seats.

In 1912 there were four diners and two combinations. The loss in that business is the difference between cost of the service and the revenue from it. The cost of service includes repairs and depreciation of dining cars, supplies and services of employees. In case of combination cars it is all charged up as dining car.

All parlor car fares go into the dining car revenue; the loss is in part for chair car service to which passenger on ordinary ticket, at 2¢ or 3¢ is not entitled, without extra payment. All passengers are entitled to dining car service upon paying for the meal.

409 Our revenue train mileage is stated in our exhibits, includes mileage made by our trains and C. N. & W. trains hauled by us, Houghton to Calumet. We ceased to carry mileage made on the Mineral Range in our revenue train mileage, Oct. 1911.

Neither our revenue train mileage or revenue locomotive mileage, includes any switching mileage. In term switching mileage, we follow I. C. C. classification; the uniform method of counting miles of switch engines is to calculate six miles to the hour regardless of how many the engine runs. The train and car mileage are actual.

We try to be quite critical to see that the entire cost of new construction is charged to the account of a particular station. This does not include transportation, of men and materials, or engineering, superintendence or supervision. If an engineer was put on a piece of work for a considerable time, that cost would be charged to it.

This is the practice, though it is an entirely new structure. We endeavor to get all the cost of material or workmen on a building charged to *to* it, but are so particular as to superintendence and things of that kind. So far as the cost involves additional expense over the general current expense, we seek to get it into the particular item of property.

We cannot divide the train mileage up into the different portions of the road so that I can give a statement of the train mileage on tracks not used in the passenger business. On track mileage that Mr. Riggs located to freight, practically none of our train mileage is computed; switching mileage is made on that. The train mileage is made almost exclusively on the trackage operated jointly by the freight and passenger service. Not one per cent of the train mileage is made on tracks used exclusively in freight business.

410 On exclusive freight track mileage, the expense of Maintenance is less than on the main line mileage.

On Complt.'s Ex. 41, Delf, under maintenance of buildings fixtures and grounds, 96% was actually allocated to Michigan; this includes all the expense of the Marquette shops. Those shops are used to keep in repair and rebuild equipment used on the entire line. I don't make any separation to the repairs that Wisconsin got from those shops. The locomotives are overhauled, repaired and rebuilt in the machine shops at Marquette, and those expenses are allocated to

Michigan in the same way. We have no extensive shops anywhere on the line other than in Michigan. A small amount of repairs might be done at Thomaston, a very little at Superior, Wis. We have no shops there; some car repairs are made at Superior by car repair crews. We have car repair crews along the line in Michigan; at the terminals St. Ignace, Soo, Houghton, and at various points where cars might require repairs. The only repairing done outside Michigan is at Superior. In 1910 the expense was maintenance alone; in 1911 maintenance and replacement of the shop that burned, which was charged to operating expenses.

The expenses of Mackinaw Trans. Co. are divided on the basis of the revenue which the owning companies have earned on their rails on freight business. This is because the revenue from passengers is first deducted before dividing the expenses. There is a charge of 50¢ per passenger for coming over the Straits which goes to the Mackinaw Trans. Co.

That *it* subtracted from the total operating expenses and the balance is divided between the companies on the relation of the freight earnings. The revenues used in dividing the Mackinaw Trans. Co.,
expense are the entire freight revenues of the participating
411 companies from the business crossing the Straits.

Outside agencies consists of agencies in connections with the traffic department and located off our line, e. g. at Pittsburgh, New York, Boston and Ashland—agencies that are working to secure traffic on our line. In various eastern cities where the C. P. R. has agencies they represent us and we pay a portion of the cost. It is a joint agency for the purpose of directing and securing business to pass over our line. In 1910 the outside agency expense was $55,977.24, which included commissions paid to agents in various territory adjacent to our line, for selling tickets.

In Calumet, Marquette, Houghton, Negaunee, Hurley and Ironwood, saloon keepers and men in stores are in touch with the foreign population and sell tickets for which we pay them a commission; that is charged to outside agencies. There is also some payment to agents of the G. R. & I. and P. M. Charges for outside agencies were assigned to Michigan, apportioned to passenger, and divided to intrastate and interstate on equated passenger mile basis. The divisions being as follows:

	Total.	Michigan.	Passenger.	Interstate passenger.	Intrastate passenger.
1910	$55,977	$46,686	$33,966	40.64%	59.36%
1911	59,242	49,113	37,170	36.58%	63.42%
1912	61,959	50,929	37,811	33.20%	66.8 %

We used the proportion of business done in each department of interstate and intrastate, equated by the addition of 15% to the intrastate passenger business, in making the division of outside agencies between inter and intra state passenger business, but did it by an arbitrary basis applying the 15% extra cost to the intrastate business. I don't think that by examining the vouchers it would have been

412 possible to locate parts of the expenses as between inter and intra state passenger. In a few instances it might have been possible. So far as commissions are concerned our accounts show the ticket and the routing on which the items of commissions are paid. So far as a particular outside agency is concerned our records do not show the business that came to our line from that office.

The expense is composed in part of rent of offices in Pittsburgh, New York, etc., and salaries to agents, etc., including advertising, if any.

As to the plan or formula of Complt.'s Ex. 41, Delf, we have been making divisions on that basis 18 or 20 years in our office, except that we did not divide between states until we came into this case.

We have not divided on our books between passenger and freight; we have made up statements separating between them for 18 years. They are not submitted to any one, we just keep them as a matter of record and information ourselves.

We did not use those statements in making Complt.'s Ex. 41, Delf; the results of previous divisions would vary some from the results in Complt.'s Ex. 41, Delf. I never investigated to see how much. We endeavored to make entirely new allocations and to be more particular in compiling Complt.'s Ex. 41, Delf, than in making those other statements. There was change of method in some instances.

The report of the apportionment of our expenses in our 1910 report to the Michigan Commission, was on a still different basis. There was a difference of some $17,000 in the Michigan expenses between that and the present assignment in the division between states.

Complt.'s Ex. 41, Delf, to a considerable extent was the method of apportionment of expenses used in the Minnesota Rate
413 Cases, though the formula used is not the same. I could not point out the differences. Complt.'s Ex. 41, Delf, is a combination of the information from the Minnesota Rate case, and our previous practices; it is my judgment of a method of division of operating expenses based on our practices and conditions and the Minnesota Rate Case. I have not the Minnesota Rate Case in mind, so I cannot make or name any definite item of difference or similarity. I do not recall how, but our method seemed more accurate and to make a better division.

The Master: You spoke of some different conditions obtaining on your road, can you specify any of those conditions?

A. Our road runs practically into only two States. The roads in Minnesota run into a number of States and are much more complex as to States than ours. We run directly from one State across the line into another. They have branch lines running into several states. It is much more difficult for them to make the division between states than it was for us having a single line running directly from one State into another.

Certain switching expenses, including yard expenses were assigned 10% passenger and 90% freight. The ratio is arbitrary representing about the proportion of service assignable to each class of business. We have used that basis for 18 years, it being fixed by my

predecessor. I do not know what he based it on, but our general superintendent says it is fair, so I have continued it. It is difficult to get at the switching movement of freight and passenger trains. I do not know whether if gotten at, it would produce the same percentages. A passenger train does not require as much switching as a freight train; the cars are assigned to particular trains and run in those altogether in passenger service. In freight service
414 trains are made up of cars that come in, or are loaded, from different points and the entire number of cars necessary to make up a train are put together by switching service each time a train is made up.

I presume the reason for decreases in freight train miles 1912 under 1910, is decrease in traffic, though I find the average number of freight cars per train has increased; it was: Passenger, including all passenger train cars, and freight train cars per train mile:

Year.	Freight.	Passenger.
1910	16.94	4.39
1911	18.18	4.43
1912	18.68	4.52

It would be possible by increasing the number of cars in a freight train to do the same amount of business with a less number of train miles. Increasing the number of train miles in the freight department, the passenger train miles remaining the same, would draw a greater amount of expense to the freight department (or vice versa) if you used the revenue train mileage basis to apportion expenses. The integrity of this basis varies with the make up of the trains.

The Mackinaw Trans. Co.'s loss was: 1910, $27,213.61; 1911, $19,832.17; 1912, $30,020.28. Those are deducted in reaching final net income results; a part of the loss is assigned to intrastate passenger business. The loss stated is the final proportion of the D. S. S. & A., which pays 40% to 50% of the total, being based upon earnings from our freight business passing over the ferry. We divide our loss with the Soo Line. Their earnings and ours go in in arriving at the earnings west of the Straits and expenses are then subdivided between us and the Soo Line on the basis of our earnings and theirs.

415 The loss is the expenses of the ferry with no compensating revenue to offset it. The freight income from the ferry is so small as to be negative; there is a little local business Mackinac to St. Ignace; it would not amount to .1% of the total.

The only income of the Mackinaw Trans. Co., outside of the little from local business is for carriage of passengers at 50¢ each, and mail and express.

I cannot give the income from freight of Mackinaw Trans. Co. as there is none, except as it enters into the through rate. There are no statements by tonnage or by cars.

The three companies participating in the M. T. Co. could not exchange business between each other if they did not have that facility; they could not get along without it.

We receive and receipt for the business over the ferry at St. Ignace. The other companies receipt for the business from the South Shore at Mackinaw City.

St. Ignace is really the initial terminal on our line. It has to be re-distributed at St. Ignace if there isn't enough freight in the car to go along, and that re-distribution is made by our company.

Western Express Co: Previous to 1909 complainant and the Soo Line each owned one-half of its stock. In 1909 complainant sold to the Soo Line; the C. P. R. owns the controlling interest in both Soo Line and complainant.

The capital stock was $50,000. The South Shore had always received 45% of the earnings of the express company over its line. On 13 express companies reporting to the I. C. C. for year 1910, the average paid the railway companies was 49% plus.

When the South Shore owned the stock of the express company there was a minimum guaranty of $3500 per month which
416 does not now exist. The proceeds of the business fall below that guaranty.

Legal expenses as shown in the operating accounts were:

Year.	Entire line.	Michigan.
1908	$5,641	$5,186
1909	5,647	.....
1910	6,210	5,186
1911	6,049	4,988
1912	27,846	26,266

The expenses of this case, not including the time of Mr. Eldredge, Mr. Walker, or other men who assisted in the litigation, other than experts and attorneys, was for 1912 $19,083, all of which was charged to passenger department, and 66.8% to the intrastate business on the equated expense basis.

The Mackinac Trans. Co. expense is all allocated to Michigan.

The 15% with which the intrastate business was equated, has been applied in the division of baggage, express and mail expenses, being spread over all the intrastate business.

The intrastate passenger business is becoming more dense every year; a steady increase from 1910 to 1912. The interstate has decreased. The ratio of operating expenses to income on the intrastate business as shown by my assignments, has increased.

	1910.	1911.	1912.
Operating ratios on intrastate passenger business as arrived at by Delf.....	67%	72%	78%
On interstate passenger business as arrived at by Delf..	59%	65%	72%
On total business in Michigan	....	....	....
Rates per passenger mile....	2.563¢	2.558¢	2.604¢
Interstate passenger miles...	14,454,301	13,031,225	11,484,564
Intrastate passenger miles...	18,358,957	19,645,802	20,090,114

417 The usual rule is that, other things being equal, the more dense the traffic, the less the operating ratio. I do not know why that rule is not borne out in this instance.

Operations of Mackinaw Trans. Co. have always shown a loss.

	Dining cars, No. of meals.	Passengers carried entire line.	Seat fares, Michigan.	Average haul.
1910	37,550	719,169	7,792	55.80 miles
1911	37,289	785,622	8,498	50.26 "
1912	38,179	790,239	7,973	47.65 "

Total cost of Soo Union Depot property including all buildings and grounds to June 30, 1911, was $117,812.11; the passenger station cost $29,845.52; water supply $2,060.44; heating plant $7,762.62; the emigration building $2,622.95; the sewer $3,668.79; miscellaneous $1,365.38. These are costs to Union Depot Co.

The northbound less than car load freight coming across the straits, is loaded as far as possible by the Michigan Central railroad at Detroit and Junction yards, with reference to the D. S. S. & A. freight, all in one car, and it — sealed and comes through across the straits to St. Ignace under seal. The same is true of the freight loaded by the Grand Rapids & Indiana Railroad destined to points on or via the D. S. S. & A. and loaded at Grand Rapids and Ft. Wayne. They load less than car load freight and the cars to and through St. Ignace under seals, it is there checked by our force, rearranged and re-loaded if necessary into west-bound cars on the D. S. S. & A. or cars going via the D. S. S. & A. and the Soo Line. North bound less than car load freight, is all checked and some of it reloaded, rehandled and readjusted at St. Ignace. On south bound business arrangements into car load lots for points in and beyond Detroit are arranged, etc., at St. Ignace. This involves re-
418 handling of most small freight at St. Ignace. The freight coming onto our line across the ferry involves re-handling or the same thing. If there were enough freight in the car it might go through to Detroit without change at St. Ignace.

Freight handled through the Soo over C. P. R. is handled at St. Mary's Transfer station at Soo in charge of the complainant and Soo Line, who bear the expense equally. Business coming on the Soo Line and D. S. S. & A. if going east, is transferred to C. P. R. cars; going west it is transferred to D. S. S. & A. or Soo Line cars, as the case may be, at the expense of those companies without the C. P. R. participating.

The Western Express Co. was organized 1895; to August 28, 1906, D. S. S. & A. received the total net earnings on its line. The August 28, 1906, contract fixed 45% of gross earnings of express company on D. S. S. & A. with minimum of $3500 per month as D. S. S. & A. proportion. June 1909, D. S. S. & A. sold its stock in express company to Soo Line at par, when a new contract was entered into giving D. S. S. & A. 45% of gross earnings on its line with no monthly minimum. To the time of sale the express company had

accumulated a surplus of $192,300 of which D. S. S. & A. received 50% or $96,150. There were no dividends paid previously.

During the time when railroad company received the entire earnings on its line, the D. S. S. & A. had withheld from its payments certain amounts as working fund, and this was distributed to South Shore in 1902, $9,640, and 1905, $5,000.

Up to 1906 the contract of the Western Express Co. with the railroad companies (Soo Line & D. S. S. & A.) was that each should receive the net earnings made by the Express Company on its line. Up to June 30, 1908, D. S. S. & A. had received in earnings from the Western Express Co. $562,986.39. We have no expenses in
419 connection with that. The D. S. S. & A. upon the $25,000 stock received about $41,700 a year. It sold this stock for $25,000.

The express revenue for subsequent years was: 1909, $41,793.38; 1910, $39,531.51; 1911, $38,827.28; 1912, $31,374.04. A part of 1909 was under the old contract.

I don't think that accounts for making it so much higher. I think the rates and the earnings of the express company were higher at that time. The only difference was one contract provided for a minimum and the other did not. I don't think the Western Express Co. operates on any other road than these two, except a small portion of the C. P. R. in Maine.

In apportionment of the advertising expense as between passenger and freight 99¼% was allocated and 1% divided on Michigan train miles; total to Michigan was $3,624.56, with $3,586.94 to passenger. This was divided between inter and intrastate passenger on equated basis of 100 to 115; 59.39% to intrastate and 40.64% to interstate. A considerable proportion could have been assigned to inter or intrastate directly on inspection of the vouchers. We did not do that as where were so little of the expenses where that could be done, and there are other items, other accounts, where assignments could have been made less satisfactory, but which would have assigned a good deal more to intrastate than we have done. It is impossible to do much in the assignment of the expenses between intra and interstate except in one or two accounts. But upon a number of accounts it would have been possible to have quite readily assigned between inter and intrastate a part of the items at least. So far as my accounting has made any separation between interstate and intrastate expenses, it has not ben based upon any requirement of the Interstate Commerce Commission.

420 The income and expenses of the Mackinac Trans. Co. are as follows:

	Total.	Mail.	Express.	Freight, misc.	Pass.	Expenses, including taxes.
June 1909 to April 1910, 10 months	$43,697	$1,324	$2,053	$2,039	$38,278	$102,443
May 1910 to April 1911, 12 months	49,664	1,443	1,861	2,852	43,506	96,323
May 1911 to May 1912, 13 months	54,126	1,723	1,746	4,942	45,711	102,175

We have no figures indicating the amount or tonnage of freight passing over the ferry. There is a record of the number of cars. I could not approximate without it. In apportionment for 1910 under docks and wharves, the following number of cars transferred, appears:

	Freight cars.	Passenger cars.
1910	50,055	5,347
1911	49,578	5,304
1912	44,894	5,972

The term passenger cars, includes baggage, mail and observation cars.In apportionment of expenses I treated one passenger car as equal to two freight cars.

Maintenance expenses on the trackage used exclusively in freight business is scattered through the accounts, and it would be impossible to pick it out.

It was impossible to ascertain the expenses on those tracks therefore we could not allocate them to freight. We could not do otherwise than to take the arbitrary basis of train miles for that.

I do not know any other basis that would divide the expense as well as the revenue train mileage. There is no way to pick out the maintenance of way and structures expenditures, incurred on account of the freight business. It cannot be done. In my opinion the cost of maintenance of such tracks is not over one-third of the cost
421 per mile of the cost of maintenance of main line tracks. There is about 62 miles of it.

If I were making an estimate I would say one-third is a fair figure. That is my idea of the average; some are maintained better than others. On some the maintenance is very slight, and on others it is considerably higher. The Fiborn branch would be higher. It would be impossible to do much more than estimate; I tried to do that.

On Complainant's line, both freight and passenger traffic are more dense Marquette to Houghton than on other parts of the line.

I should say traffic was heavier from Marquette to Soo than from Nestoria west to State line. On both those divisions the traffic is considerably lighter than from Marquette to Ishpeming and there to Houghton, both in the freight and passenger departments. My judgment is it would be slightly heavier Soo Junction to St. Ignace than Marquette to Soo Junction.

I cannot tell you on what part of the line the operating expenses are heaviest; we do not endeavor to separate them by divisions. I think we might give you some maintenance costs as to divisions, but we don't separate operating expenses. We make figures on separate sheets as monthly exhibits for our officials for their information, so they can compare what is being done in certain items on one division with another division.

On the South Shore there are four trains that run in two states—two each way a day on main line. There may be other trains that come up over the state line from the south, considered as interstate,

where we attach a locomotive to the interstate train and take it on.

422 No records of the train or car movements or switching operations in the yards is kept.

The apportionment of 90% and 10% as between passengers and freight as percentages of expense of switching and kindred items is purely arbitrary and not based on any record of train or car movement, or any statistics. It was a matter of judgment and estimate as to the relative proportions of the switching in the two classes of service.

Considering switching expenses, arbitrarily assigned on the basis of 10% and 90% as allocated, in our computation, 66.94% of the total operation expenses were allocated in 1910.

There were a number of other items where an arbitrary basis of assignment was used to reach what we call direct allocations, e. g.: steam locomotive repairs, yard expenses, supplies for locomotives, including lubricants and fuel; fuel for road locomotives, so far as the locomotives were used in both passenger and freight service, fuel was apportioned to each service on miles run in each; we estimate same cost per mile for fuel for freight locomotives as for passenger locomotives, where locomotives are of the same size and type. The figures heretofore produced indicate the cost of fuel per freight locomotive mile (19¢) to be considerably higher than per passenger locomotive mile (11¢). That is acounted for by the fact that heavier locomotives were used in freight service, where they are used almost exclusively or entirely in that service. We were working on the totals and not on individual locomotives when we got the figures of 10¢ and 11¢ for passenger mile for coal, and 19¢ for freight.

I think on the average, larger locomotives are used in freight than in passenger, service.

I am not prepared to say that the cost per mile for coal is the same in passenger and freight service. The passenger train loco-

423 motives are lighter and the mileage in the freight is made more slowly than in passenger service.

Other items given as being directly allocated which were allocated on arbitrary bases, are the following: part of train supplies and expenses (under transportation); Industrial and *E*mmigration Bureau; station employees; station*a*ry and printing, traffic;

The C. M. & St. P., C. & N.W. and Soo Line are operating for 2¢ passenger fares in Michigan, as are also some of the roads in Wisconsin including complainant, since 1907; most of the roads in lower Michigan operate under 2¢ fares, there may be some small roads that don't.

The items included by me as being directly allocated in the use of Complt.'s Ex. 41, Delf, on which some arbitrary basis was used, are same for years 1910, 1911 and 1912, except the Industrial and *E*mmigration Bureau. The percentages which I treated as allocated directly, which include those heretofore described as being allocated on arbitrary bases, are: 1910, 66.94%; 1911, 68.1%; 1912, 67.4%.

On Feb. 24, 1913.

DELF, recalled.

Further cross-examination.

By Mr. Wykes:

There is a separate dock charge, becoming effective Feb. 24, 1913, of 5¢ per ton, on ore, shipped within 10 days after arrival, and ¼¢ per day additional for storage, if it is not shipped within 10 days. That has been added to the previous rates of 25¢ or 30¢.

More than 90% of our ore shipments pass over the Marquette docks and is given separately as interstate iron ore. Not more than 10 or 15% of the rail shipments are interstate.

The greater part of ore passing over the Marquette docks bears 25¢ rate, say 75% or 80%, the remainder bears a higher rate.

421 The rates including dockage, have now gone to 30¢ and 35¢.

The rates at 25¢ and 30¢ have been in effect 7 or 8 years. Previous to 1895 or 1896, they were 30¢ and 32¢ or 35¢. There was material reduction when the L. S. & I. commenced operation about 1896.

(Agreement that all tariffs produced may be used without being introduced in evidence.)

Sheets showing maintenance expenses by divisions for 1912, for April 1911 and May 1911, produced, marked Defts.' Ex. 10, Delf. These apportionments were from reports rendered by road-masters on the various divisions and the expenses are all in the general block "maintenance of way and structures."

I made a tabulation showing the average running time for passenger trains on Dec. 15, 1910 and June 30, 1911. On Dec. 15, 1910, the average running time for passenger trains between terminals was 22.4 miles per hour, which includes time occupied in making stops. On June 30, 1911, the average speed was 24.2 miles. The table showing speeds of various trains was marked Defts.' Ex. 11, Delf, and introduced in evidence.

This exhibit comprehends the movement between selected stations to show the higher speeds. The average speed of freight trains between terminals including stops was: Dec. 15, 1910, 10 miles per hour; June 30, 1911, 10.7 miles per hour.

There is passenger service on the south line between Eagle Mills and Negaunee, but none Negaunee to Winthrop Junction. On the south track, Eagle Mills to Negaunee, there is a break or cave-in at Queen Mine—there is no passenger service on that track. This is the old Marquette and Western line running through Queen Mine property to Negaunee. The trains which take the south line out of Marquette run over that track to Eagle Mills. They then take one of the new tracks of the north line into Negaunee.

425 (Witness states branches used exclusively in ore business, as follows:)

"The Negaunee mine branch, .21 of a mile; Negaunee and Palmer branch, 4.19 miles; Milwaukee branch, 1.74; Mary Charlotte branch, 1.39; Teal Lake branch, 1.39; Lake Superior mine pit .34; Lake shaft, .32; Winthrop mine branch, 1.94; American mine branch two miles; Champion mine branch, .98; Imperial mine branch, 1.03; Webster mine branch, .89; Beaufort mine branch, .72."

Side tracks of these branches would come under the same use as the branch. Wherever the word "mine" is used in connection with the siding, on Complt.'s Ex. 1, Riggs, they are mine sidings. There are quite a number of tracks at Marquette that mostly ore business is done on.

The figures in our income due to mileage books are for the mileage as used. On June 30, 1912, we had out $19,365.66 of mileage not used; I think the amount outstanding is increasing;

Operating ratios of the company from the reports to the State Railroad Commission, follow:

	Michigan.	Entire line.
1910	64.88%	68.72%
1911	69.59%	72.07%
1912	72.00%	75.98%
1913	75.55%	79.83%

Our passenger train mileage includes mileage made on the Mineral Range by South Shore trains as follows:

1910	19,544 miles
1911	39,424 miles
1912	9,912 miles

In each of the three years there was about 30,000 miles of passenger train mileage made on South Shore in Michigan, not included in our mileage figures, this being made by C. & N. W. and C. M. & St. P. trains. Those trains were drawn by locomotives of, and had train crews paid by, those companies and the equipment belonged to them. The revenue came to South Shore. There were other trains on the C. & N. W. and C. M. & St. P. which were operated by D. S. S. & A. locomotives, and train mileage of those trains is included in our mileage.

426

DELF.

Redirect examination:

The property of M. H. & O. except 80,000 odd acres of land was deeded to D. S. S. & A. in 1900; the land grant lands owned by the D. S. S. & A. Ry. were deeded to trustees who, in turn, deeded them to South Shore Land Co., by whom they are now held. The stock of South Shore Land Co. is entirely owned by D. S. S. & A. In 1887 these lands were conveyed to D. S. S. & A. but in 1900 were deeded back to M. H. & O. and then deeded to trustees and by them to South Shore Land Co.

The time cards, chart, and train sheet referred to in McPherson's

testimony (Complt.'s Exhibits 61, 62 and 63) are the originals of what they purport to be. I assisted in making the chart.

I prepared statements showing for 1911 and 1912 the percentages of card and coupon tickets which were interstate and intrastate. The percentages of all tickets sold which were intrastate were: 1911 and 1912, card or local tickets 98%, coupon tickets, 75%; and of the total of all tickets intrastate tickets was 94%.

In operating expenses are considerable sums which would be allocatable or approximately to intrastate, or which plainly appear chargeable to intrastate in greater proportion than the percentages suggested in the testimony for the division of Michigan passenger
expenses between the intra and interstate passenger busi-
427 ness. Wages of station employees, passenger trainmen, conductors, baggage-men and station employees in Michigan; passenger proportion 1910, $37,119.96; 1911, $41,033.33; 1912, $40,840.53. As 94% of the ticket sales by the employees were intrastate tickets it seems proper if we are endeavoring to allocate between inter and intrastate, to apportion 94% of their expenses to intrastate. It was divided on the revenue basis equated, 1910, 56% intrastate. As 85% to 88% of the total ticket or passenger fare collections made by conductors, were intrastate, and 84% to 88% of the passengers traveling on trains are intrastate passengers 84% or 88% of the wages of those trainmen should be assigned to the intrastate business. These items were: 1910, $45,189.58; 1911, $49,969.53; 1912, $52,275.23.

The fare reduction in Michigan of passenger fares from 4¢ to 3¢ was in Sept. 1907; since that time we have never made as many passenger miles as in 1907. That appears on Complt.'s Ex. 43, Delf, the passenger miles were: 1907, 33; 1908, 32; 1909, 32; 1910, 32; 1911, 32; 1912, 31; millions in each case. 1907 was the biggest year in the history of the company. Three months of the year ending 1908, were on the basis of 4¢ fare.

DELF.

Recross:

In 1907, the number of passengers traveling one mile was much more than in previous years. No subsequent year fell as low in passenger miles as any of the years previouss to 1907. In 1907 the freight tone one mile increased 7 million tons over 1906, and the next two years, 1908 and 1909, the freight earnings fell off considerably and recovered again in 1910. In 1907 the passenger miles increased approximately 4½ million miles over 1906. In 1910 the
passenger train miles almost recovered to the point of 1907.
428 The average received per mile per passenger has been the following: 1906, 2.825¢; 1907, 2.785¢; 1908, 2.59¢; 1909, 2.541¢ 1910, 2.543¢; 1911, 1.519¢; 1912, 2.551¢.

It is the general impression that 1907 was a good railroad year all over the country, and better than the next two years.

Ticket agents do other things besides sell tickets; some are telegraph operators, they carry mail to post offices, bill freight, make all

necessary repairs, sell accident insurance; sell pullman tickets, act as agents for telegraph and the express companies, build fires, check, load and unload baggage.

I applied the percentages derived from the sale of tickets only to passenger proportion of compensation. In the sale of tickets for our line we have card and book tickets; the running and terminal times of the trains and prices for the tickets, are all known to the ticket seller and it is simply a matter of reaching around and getting the ticket and passing it out, and the inquiry with regard to the time of the trains is very briefly answered. Where the agents sell tickets off the line to foreign lines, it in instances consumes a good deal of time to look up the time and the connections and incident things.

I treated the salaries of station employees as common and divided between inter and intrastate on equated basis, that was on the theory that there was such a small part of the operating expenses that can be separated between inter and intra business that it was a fair proposition to divide the total passenger expenses between the inter and intrastate as we have done it, without trying to allocate any; where error occurred in one instance it was offset on the other side. It is not possible to reach a mathematical or a close determination of the amount of time of the ticket agent used in the interstate or in intrastate service.

429 The average number of cars per train mile on the South Shore were as follows:

	Passenger train cars.	Freight train cars.
1908	3.98	17.19
1909	4.27	16.55
1910	4.33	17.36
1911	4.42	18.41
1912	4.52	18.69

On April 22, 1913.

DELF, recalled.

Further direct examination.

By Mr. Butler:

(The witness produced a statement containing separation of certain operating expenses by divisions, for the years 1910 and 1911.) The Western Division as shown on these sheets, comprices the division Nestoria to Superior. The statements are as follows:

Division of Certain Roadway and Track Expenses, Year Ending June 30th, 1910.

	Mackinaw Division.	Houghton Division.	Western Division.	Total.
Superintendence	$5,857.22	$5,320.17	$6,151.95	$17,329.34
Ballast	1,134.12	513.50	857.17	2,504.79
Other Track Material	8,316.69	13,922.59	7,165.08	29,404.36
Roadway and track:				
Applying Ballast	2,711.63	207.30	1,821.25	4,740.18
" Ties	18,127.16	12,446.39	21,288.79	51,862.34
" Rails	3,538.00	3,595.06	1,251.21	8,384.27
" Other Track Material	1,318.16	1,374.00	268.50	2,960.66
Track Maintenance	50,069.63	36,979.11	53,222.04	104,270.78
Care of Roadbed	723.30	1,169.60	6,949.90	8,842.80
General Cleaning	5,121.33	3,640.40	7,806.55	16,568.28
Partolling & Watching	7,594.66	6,251.47	5,122.78	18,968.89
Changing Alignment and Grades	55.65	13.50	1.50	70.65
Bank Protection	22.74	241.60	137.70	420.04
Filling	7.30	3.81	72.50	83.61
Other expenses	.....	60.00	.....	60.00
Train Service	2,318.39	1,846.88	5,590.92	9,756.19

THIS PAGE BOUND

Duluth, South Shore & Atlantic Railway.—*Continued.*

	Mackinaw Division.	Houghton Division.	Western Division.	Total.
Removal of snow, Sand and Ice	13,346.72	10,589.43	4,286.74	28,222.89
Snow and Sand Fences and Snowsheds	114.03	157.45	176.92	448.50
Roadway, Tools & Supplies	1,745.44	1,915.59	1,981.36	5,642.39
Maint. Jt. Trks. Yds. & Fac.—Dr.	3,222.46	7,131.22	6,948.87	17,302.55
Ditto—Cr.	4,177.48	4,926.54	35.80	9,139.82
	$121,167.15	$102,452.63	$131,065.91	$354,685.69
Mileage of main line and branches maintained on June 30th, 1910	212.27	145.31	216.96	574.54
Per mile	$571.00	$704.00	$604.00	$618.00

Duluth, South Shore & Atlantic Railway Company.

Division of Certain Roadway and Track Expenses, Year Ending June 30th, 1911.

	Mackinaw Division.	Houghton Division.	Western Division.	Total.
Superintendence	$5,557.69	$5,024.83	$6,579.25	$17,161.77
Ballast	1,104.32	694.02	2,725.80	2,725.80
Other Track Material	8,777.52	10,215.27	12,913.04	31,905.83
Roadway & Track:				
Applying Ballast	996.65	738.85	566.15	2,301.65
" Ties	11,671.89	8,877.56	13,999.20	34,548.64
" Rails	975.99	2,903.21	989.87	4,869.07
" Other Track Material	1,403.06	1,376.53	597.17	3,376.76
Track Maintenance	42,911.22	37,494.20	52,597.36	133,002.78
Care of Roadbed	396.73	630.22	2,107.41	3,134.36
General Cleaning	12,719.52	5,094.25	13,422.50	31,236.27
Partolling & Watching	8,166.51	7,399.82	7,732.24	23,298.58
Bank Protection	15.50	163.60	7.50	186.50
Filling	4.00	59.50	65.70	129.60
Other expenses	.....	55.00	.....	55.00
Grain Service	2,146.62	1,327.74	3,523.09	6,997.45
Removal of Snow, Sand and Ice	17,992.70	15,297.21	6,479.21	39,769.52

Duluth, South Shore & Atlantic Railway.—*Continued.*

	Mackinaw Division.	Houghton Division.	Western Division.	Total.
Snow & Sand Fences & Snowsheds.....	202.00	41.29	41.10	284.39
Roadway Tools & Supplies.....	1,735.54	1,703.37	2,023.97	5,480.88
Maint. Jt. Trks. Yds. Fac.—Dr.....	3,438.01	9,280.07	3,478.95	16,195.03
Maint. Jt. Trks. Yds. Fac.—Cr.....	3,534.91	7,158.88	512.80	.....
	$116,698.57	$101,217.95	$127,536.77	$345,453.29
Mileage of Main Line and Branches Maintained on June 30th, 1911.	211.86	145.31	217.88	575.05
	$551.00	$697.00	$585.00	.....

432 These were prepared for the same purpose and in the same manner as the previous statements for 1912 (Defts.' Ex. 10, Delf).

(Witness produced, and there was introduced, a compilation (Defts.' Ex. 13, Delf) showing the speed of freight trains for June 30, 1911, and Dec. 15, 1910. These are the same days covered by the statements previously given for passenger trains. This covers freight movement between the same points as listed for the passenger trains, as far as I could make it up. I don't know that it covers all the freight train movements. I found none showing train movements faster than these. I gave instruction to put in the highest movements.

Defts.' Ex. 6, Maney, prepared by me, is a statement of earnings per train. The method of arrival at the mail and express earnings shown on the exhibit was by arbitrary apportionment.

The 90% and 10% for the division of the costs of yard locomotive employees and enginemen was on the basis that we had always used since we have endeavored to make a division of operating expenses between passenger and freight business, back in 1894, and prior to that time, when I. C. C. required us to divide those expenses in our reports. The assumption was that that represented the time of men employed in the two different services.

Q. The expense of the maintenance of the property that is used by the locomotive that is divided on the basis of 10% and 90% should also be divided on the basis of 10% and 90%, should it not, if you could separate that expense from the expense of maintenance of main line, assuming that the 10% and 90% is proper?

A. I don't think so.

Q. Your idea was that the switching movement was 10% for the passenger service and 90% for the freight service, and that switching movement uses the sidetracks; if your percentages are

432a right in the proportion of 10 and 90, that is true, isn't it?

A. Yes.

Q. Why, in addition to dividing the expense of the men who operate these locomotives on the ratio of 10% and 90%, do you not also divide the expense of maintenance of the tracks over which the operation is carried on?

A. Because that maintenance comes under the general maintenance item of accounts, it is not kept separate, and the general maintenance accounts are divided on the revenue train mileage basis.

Q. The revenue train mileage basis for certain years throws 48% of the cost of maintenance into passenger departments?

A. Yes.

Q. When, as a matter of fact, your observation leads you to the conclusion that the switching operations over those sidings is on the basis of 10% and 90%?

A. I don't see that that is a question at all. That last part, there, is a statement.

Q. The purpose of your division, Mr. Delf, in your assignment of expenses, was to get a fair assignment as between passenger and freight?

A. All expenses, yes, and I have endeavored to be both fair to the passenger and freight departments.

Q. If the operation over the tracks over which switching is carried on is on the ratio of 10% to passenger and 90% to freight, why would it not be fair, and why is it not proper, to divide the expense of maintenance of those tracks upon that ratio, rather than upon the ratio of 48% and 52%?

432b A. Rather than upon the revenue train mile basis? In dividing the total expenses, including the maintenance of these yard tracks, on revenue train miles, there are certain portions of these yard expenses that is apportioned to the freight business that should be properly apportioned to passenger business; that is the time occupied by freight trains on sidings waiting for passenger trains to pass by, and it seems to me that, taking the whole question and all other things into consideration, you get a fair and equitable result, rather than trying to divide the maintenance expense of which we have no record on this 10% and 90% basis.

Q. Then it gets back to this, although you are satisfied in your own mind that those sidings are used by the freight and passenger trains on the basis of 10% and 90%, and there you have somewhat of a close method of apportioning that expense of maintenance between the two different departments, you take, rather, the general division on the basis of revenue train; that is true, is it not?

Mr. Butler: The maintenance is not kept separate, and has never been, and cannot be.

The Master: Well, should it be; that is the point?

Mr. Butler: I don't think it can be; I don't see how it can.

The Master: The reason it is on a different basis is because it is impossible to tell what it is or because that is the proper basis?

A. That is what we have done.

Q. And in your mind you justify that with the general claim that the freight train has to wait on the siding for the passenger train?

A. No, not on that alone. For all the reasons brought out in this case as to the items of expense now charged to freight trains, properly chargeable, if we could arrive at them, to passenger trains.

432c Q. All those reasons were referred to for the purpose of justifying the use of the revenue train mile basis for division of common expenses, where the revenue train mile was made by two different kinds of trains, and the reference to those different items, such as waiting for passenger trains, was to offset the greater weight and the greater number of car wheels and the greater length of train and the greater tractive power required in the freight service; that is true, is it not?

A. I don't know that it is in regard to all of those items.

Q. What I want to know is what justification there is for applying that general and somewhat indefinite method of division on the revenue train mile basis, which throws 48% into the passenger service and 52% into the freight service, when you are satisfied that a large part of the expense is incurred on switching tracks, where the operation is on the basis of 10% and 90%?

A. I think I can only repeat my former answer, that the revenue train mile basis seems to be the only basis that can be fairly used in dividing the common expenses.

Q. You wouldn't say that it was proper to use the revenue train mileage for a part of it, where observation and experience of a good many years and the practice of the company has indicated a different ratio of expense in the different services, would you?

A. I think you have to view that situation as a whole, not by piecemeal, and that it does, then, give a fair division, the revenue train mile basis.

Q. In addition, on South Shore, you have a good deal of mileage not used at all in passenger business?

A. Yes. I think it is 62 miles.

432*d* Mr. Butler: Of spurs and sidings.

A. Yes, those industrial branches. The Bessemer Jct. mileage is included in these branches—in that 62 miles.

Q. There is the Humboldt to Republic branch?

A. There is passenger operation on that.

Q. There is one car one way once a day?

A. There is a daily train. The mileage from Eagle Mills to Winthrop Jct. is included in the 62 miles.

Q. Wouldn't it have been fair, Mr. Delf, to have laid aside the expense on that 62 miles for maintenance before you attempted to apply to all of the expenses the revenue train mile basis?

A. It couldn't be done. You don't know what the expenses are, and couldn't have added them.

Q. It couldn't have been done to a penny, but it could be arrived at by the use of some more or less arbitrary method, could it not?

A. You could use an arbitrary method and lay it aside, yes.

The Master: Could you have estimated it substantially?

A. I have testified that the maintenance of those tracks is not over a third of what it is on the main line per mile.

Q. If you could have arrived at the expense of maintenance of that part of the track not used in the passenger business, you would have located it directly to freight, would you not, before applying your revenue train mile basis?

A. No, I don't think I could.

Q. Why not?

A. Because it would bring in so many other items that you might endeavor to allocate in that same way that you would get so many estimates in that your results would be practically of no value.

432*e* Q. Why would they be of no value? Isn't the thing we are after an allocation of expense between passenger and freight? And tell me why, the closer you locate, we are not getting the most accurate results—why, if we get closer to the point in view than you have gotten, your results would be of no value?

A. When you eliminate these items that you would apply an arbitrary or estimated basis to, and then apply another basis, which the revenue train mile would balance, you haven't a proper factor for dividing the balance. I have testified that there is no revenue train

mileage of the road made on this 62 miles; if there is any, it is a very small fraction of one per cent.

Q. Now, then, why is any equation disturbed by first eliminating the expense of maintenance of this property used exclusively in freight business?

A. You would have to then add something to your passenger percentage to take care of those other factors that you have brought in; where the freight expense is charged to a portion of the passenger expense, you would have to bring another arbitrary in there to offset that.

Q. You mean to tell me that this track and the expense on this track not used in the passenger business has been mentioned in this case as one of the elements justifying the use of the revenue train mile basis?

A. No.

Q. Suppose, instead of its being 62 miles used in the freight business exclusively, it had been one-half the road,—one-half the mileage,—would you still say that the revenue train mileage basis should be used?

A. Well, that would change the entire situation.

Q. Then, to what point would you go before you said that the revenue train mileage basis should be abandoned?

A. I am not prepared to say.

432*f* Q. Now, you have examined certain other cases, Mr. Delf, where the revenue train mile basis for the division of common expenses has been used, have you not?

A. Yes.

Q. Do you know whether it appears in the record, or does it, to your knowledge, appear in the record, of any of those cases that there was a mileage used exclusively in one department of the service?

A. I don't recall any of them, whether that was gone into or not.

Q. Will you give us the various reasons upon which you justify the use of the revenue train mile basis for the division of common expenses?

A. Because I believe it most fairly represents the use of property in the two classes of operation, in every way that it is used.

Q. Does it represent the use in point of time.

A. Time is an element that enters into it.

Q. Then you wouldn't care to say that it represented the use in point of time alone?

A. No.

Q. Because, due to the fact illustrated by the tables this morning, and a similar table the other day, the slower moving train does use the track for a greater length of time and requires exclusive use for a greater length of time than the passenger train; that is true, is it not?

A. I think the passenger trains are on the track just as long as the freight trains; not on any individual piece of track, perhaps; a freight train takes longer time going over the track. Taking the railroad as a whole, the passenger trains are on just as long as the freight; they are on the track all the time, and so are the freight trains.

432*g* Q. Standing in the yards part of the time; that is the reason for the answer that they are on the track all of the time, is it not?

The Master: You mean they are in motion all of the time?

A. No.

Mr. Wykes: I believe I stated that the freight trains occupied the tracks longer than the passenger.

The Master: Do you mean while they are in motion?

Mr. Wykes: If your honor please, this is exactly what I mean: When a freight train is on the track, on the main line, it uses a certain part of the line for a certain length of time in exclusion of all other service. It has the exclusive use of the track during the time that it is on it; that is true, is it not?

A. That is true as to each class of trains.

Q. And the slower moving train, of course, consumes a greater time in getting over the track between terminals; that is true, is it not?

A. Between the same terminals, it would be, yes.

Q. And between the extreme terminals of the road, also; that would be true, would it not?

A. Yes.

Q. And, for that reason, uses the track for a longer period than faster moving passenger trains?

A. It is on the track between terminals—between the points it is running—a longer time than a passenger train would be between the same points.

Q. And that comprehends an exclusive use of the track for a longer time than the passenger train would use it?

A. I don't think it has the exclusive use of all of that track between those terminals.

432*h* Q. I am not talking about all the track between the extreme terminals. Take, for example, Mr. Delf, a freight train leaving Soo Jct., going towards Newberry, would have the exclusive use of the track between those points, would it not?

A. Not necessarily.

Q. It would of the track in front of it?

Mr. Butler: For how long?

Mr. Wykes: Until it reached the other terminal—until it reached Newberry.

A. There might be a passenger train right in front of it, going the same direction; there is no station between Newberry and Soo Jet. about seven or eight miles.

Q. There might be two freight trains in that seven or eight miles?

A. Yes, or one passenger train, and one freight train leave immediately after it.

Q. But the passenger train made that mileage at the rate of something like 35 or 40 miles, according to your tabulation; is that correct? You have it before you, I think.

A. The freight train ran 20 miles an hour in there.

The Master: Supposing a freight train mile consumes twice as

much time as a passenger train mile, what effect would you give that in apportioning operating expenses, if any?

A. I wouldn't give it any.

Q. What other element besides the element of time did you consider in determining the revenue train mile basis to be proper?

A. I think I can only state that generally as the use of the property by the trains.

432 Q. The use of the property?

A. Yes, the general use of the property by the trains.

Q. Isn't it a fact that the freight train is much heavier than the passenger train?

A. As a whole, sometimes it is.

Q. Well, as a rule?

A. I think so.

Q. Isn't it a fact that the number of cars in a freight train is much greater than in a passenger train?

A. Yes.

Q. Three to five times, on the South Shore?

433 A. Somewhere there, from two to four times.

Q. And isn't it in addition a fact that there are many more wheels and wheel impacts in the movement of a freight train than in the movement of a passenger train?

A. Yes.

Q. And isn't it also a fact that greater tractive force is required to move the greater weight?

A. Greater tractive force is required to move the greater weight.

Q. Now as against that, all of which would create a higher expense per train mile in the freight department than in the passenger department, two items have been mentioned in this case, one is the greater speed of the passenger train and the other is the fact that the freight train waits *from* the passenger train,

Q. Now, per train mile, what are the things that make for the higher cost in the passenger service, in your judgment?

A. One is the item of freight trains waiting on sidings for passenger trains, the high speed of the passenger train, the elevation at curves to take care of that, the removal of snow and ice, a great deal of it is done to clear the track for passenger trains, that wouldn't be done if freight trains only were moved.

Q. Is that all?

A. Those are the principal ones that occur to me now.

Q. Now, the element of removal of snow and ice is a small item isn't it?

A. From 28 to 38 thousand dollars a year.

Q. You don't mean to say that none of that would be done if it were not for the passenger service?

434 A. No.

Q. You mean you get to it a little quicker because of the passenger service, you would have to remove it anyhow but wouldn't remove it quite as quickly and wouldn't be attended with quite as much expense?

A. There is a lot of extra expense put into that item to clear the

track for passenger trains, that wouldn't be done if we could let traffic lay until the storm was over, clear the track when that occurred.

Q. Have you ever made any computation to find out how much that was?

A. No, I cannot estimate it.

Q. And when you speak of the elevation of curves do you mean the cost of elevating?

A. No, the wear and tear occasioned by the elevation and the moving of freight trains over them.

Q. Have you ever made any computation to find the cost of that?

A. I have not.

Q. You are not an engineer?

A. No.

Q. And you don't give an opinion on this from an engineering standpoint?

A. No.

Q. Simply from the standpoint of what you have noticed by going over the roads since you have been Auditor there?

A. Simply from general observation in my connection with the railroad work.

Q. But the accounts themselves do not furnish anything to indicate to you that there is a greater expense due to the passen-
435 ger service?

A. No, the accounts don't indicate any of these things.

Q. Nor the extent of it?

A. No.

Q. How do you know, Mr. Delf, that these four items that you have mentioned, the speed of the passenger train, the waiting of freight trains for passenger trains, the removal of snow and ice and the elevation of curves, how do you know that those items of extra expense due to the passenger service balance the extra items due to the freight service that we have enumerated here this morning?

A. I don't know that they balance.

Q. And yet they must approximately balance before you can correctly use the revenue train mile basis, must they not?

A. They should.

Q. Do you know how close they come to balancing?

A. No, I do not."

On Jan. 29, 1914.

DELF recalled.

Further direct examination.

By Mr. Butler:

I have prepared statements showing results of operation of complainant for fiscal year ending June 30, 1913. This statement containing 24 pages, marked Complt.'s Ex. 67, Delf, Jan. 29, 1914. Page 1, Complt.'s Ex. 67, Delf, mileage owned June 30, 1913 (similar to Complt.'s Ex. 31, Delf).

Pages 2-4, Complt.'s Ex. 67, Delf, shows revenue locomotive mileage, divided between states and between passenger and freight. (Similar to Complt.'s Ex. 32, Delf.)

Pages 5-7, Complt.'s Ex. 67, Delf, revenue train mileage divided between states and between freight, passenger, mixed and special service. (Similar to Complt.'s Ex. 33, Delf.)

No mileage made off the South Shore line is included in this statement of train mileage. The mileage of C. & N. W. passenger
436 trains running west of Negaunee to Houghton over D. S. S. & A. and of C. M. & St. P. running west of Champion over D. S. S. & A. are included. The mileage of C. & N. W. trains between Negaunee and Marquette and C. M. & St. P. trains between Republic and Marquette, and Champion and Marquette, is not included.

On C. & N. W. trains running west and east of Negaunee the D. S. S. & A. receives all of the revenue.

On C. & N. W. trains Negaunee to Houghton the train and locomotive crews are employees of, and the locomotive belongs to, the D. S. S. & A.

When the C. & N. W. train comes to our line at Negaunee, its employees and engine leave the train and our employes and engine take it to Houghton. The equipment, except engine, belongs to C. & N. W. or Pullman Co., and I believe consists of mail, baggage, and express car, a second class coach, first class coach, sleeper and diner.

The return of the same train, Houghton to Ishpeming, where it is passed over to C. & N. W. is in the same manner, it being handled both ways by South Shore crew and power. The C. & N. W. pays us 12.5¢ per train mile between Negaunee and Calumet to let that train go over our tracks. The South Shore receives all revenue earned, Negaunee to Houghton, and return, both through and local revenue between those points, getting the local rate on through business either way.

This train does local business between Negaunee and Houghton and South Shore gets and keeps all the revenue; this arrangement permits passengers to go through without change of cars at Negaunee; our company keeps the 12.5¢ per train mile for mileage of this train made on the Mineral Range, Houghton to Calumet.

437 The C. & N. W. also runs a daily train, Negaunee to Marquette and return; the entire equipment including engine belongs to C. & N. W. except Pullman sleeping car, and the crew is C. & N. W. The C. & N. W. pays us 10¢ per train mile for the running of the train, and the entire revenue earned, through or local, goes to the D. S. S. & A. In case of passengers from Chicago on that train, the C. & N. W. allows us revenue from Champion to Marquette, 31 miles, or 19 miles more than from Negaunee to Marquette. We get the local rate, Champion to Marquette, for business carried, Negaunee to Marquette; that rate is about 90¢ or about 3¢ a mile.

That train does a great deal of local business. The through fare is not charged, that is based on Negaunee, plus the local, Negaunee to Marquette, but owing to the chance that the C. M. & St. P. might have carried that passenger through Champion, the C. & N. W. allow us the Champion proportion, giving us the same amount we would

get from the C. M. & St. P., if it had carried it. The same rule would apply to a passenger going from Marquette by the same route to Chicago.

The mileage of the C. & N. W. train Negaunee to Copper Country, and return to Ishpeming, is included in train mileage shown on p. 7, of Complt.'s Ex. 67, Delf, as far as Houghton.

The mileage of C. & N. W. train, Negaunee to Marquette and return, is not included in the passenger train mileage on p. 7, of Complt.'s Ex. 7, nor in any of our statistical figures.

"Mr. Eldredge: The reasons for the payments by the Northwestern, and they are the same for the payments by the St. Paul in a general way, are that the Northwestern desires to compete with the Chicago, Milwaukee & St. Paul railroad for business from Marquette and for business from the Copper country. It can only reach the
438 copper country or Marquette over the line of the Duluth, South Shore & Atlantic Railway Company, but it can reach the copper country and does reach the copper country not only over the South Shore but over the Copper Range.

Mr. Wykes: And the South Shore is in a position to dictate the terms of entrance of the Northwestern to Marquette and to Houghton also?

Mr. Eldredge: Yes."

For C. M. & St. P. passenger trains running over our lines, Champion to Houghton, and Calumet, we receive $15 per day; that train consists of a mail, combined baggage and express cars, second and first class coach, sleeper and diners the distance traveled by this train Champion to Houghton is 63 miles, or 77 miles to Calumet the $15 per day is for the round trip and our company keeps it all.

The D. S. S. & A. power and crew handle the train, Champion to Houghton, the train does local business, the D. S. S. & A. receives the revenue accruing between Champion and Houghton and its employees collect the local fare; on through tickets the C. M. & St. P. pays us the full local out of the through rate. This train mileage is included in the passenger train mileage on page 7 of Complt.'s Ex. 67, Delf.

The St. Paul trains run from Republic (Milwaukee Junction) to Marquette and on return trip Marquette to Champion.

This train is daily, except Sunday, and comes from Milwaukee. The distance, Champion to Marquette, is 31 miles, and Marquette to Republic, 34 miles. The St. Paul power and crew handle the train. We receive all of the fares, both local and the proportion of the through fare accruing between the Junction with the St. Paul and the destination of the ticket; the train does local business between these points.

439 Of the through fares we receive the full local for the distance traveled on our line. The St. Paul pays us nothing additional. The St. Paul, Champion-Copper Country train carries a St. Paul company sleeper, on which our company pays no mileage. The C. & N. W. trains Negaunee to Copper Country and return to

Ishpeming, handles a Pullman car both ways daily, but our company pays nothing for the use of it.

The mileage of the St. Paul train into and out of Marquette is not included in the mileage on p. 7, Complt.'s Ex. 67, Delf.

On the return trip of C. M. & St. P. copper country train we retain the revenue from the origin of the ticket, on through tickets, to Negaunee. That distance is 19 miles more than the local fare to Champion; on a ticket of that kind, Houghton to Chicago, we receive $2.48. The same rule would apply from points between Champion and Houghton. The through rate to the passenger is not increased; it is a mere question of division between carriers.

Pages 8-9, Complt.'s Ex. 67, Delf, car mileage, for year ending June 30, 1913, showing division between states, and between passenger and freight, and other classes. (Similar to Complt.'s Ex. 34, Delf.)

The second item on p. 8, sleeping, parlor and observation car mileage, is the mileage of that class of cars, not owned by D. S. S. & A. The mileage shown at the bottom as sleeping and dining cars, is the mileage of those cars owned by D. S. S. & A.

Page 10, Complt.'s Ex. 67, Delf, operating revenue for entire line and for Michigan. (Same as Complt.'s Ex. 35, Delf.) It is made on same basis as Complt.'s Ex. 35.

Page 11, Complt.'s Ex. 67, Delf, operating revenues in
440 Michigan, divided between passenger and freight. (Similar to Complt.'s Ex. 36, Delf.)

Page 12, Complt.'s Ex. 67, Delf, operating expenses for fiscal year 1913, by general accounts; (similar to Complt.'s Ex. 38, Delf.) This conforms to and is based on I. C. C. classification.

Page 13, Complt.'s Ex. 67, Delf, tonnage statistics for fiscal year 1913. (Similar to Complt.'s Ex. 42, Delf.) The average interstate haul, 66.34 miles, is the average haul in Michigan on D. S. S. & A. of interstate freight; that is also true of the corresponding figure for prior years. I have not in any instance arrived at the average length of haul on our line on the interstate business touching Michigan, including the haul on our line outside Michigan.

Page 14, Complt.'s Ex. 67, Delf; passenger statistics for fiscal year 1913. (Similar to Complt.'s Ex. 43, Delf.) The average haul of interstate passengers in Michigan in this and similar exhibits for 1910, 1911 and 1912, includes no part of the journey of any such interstate passengers, made outside of Michigan.

Page 15, Complt.'s Ex. 67, Delf, freight statistics in Michigan for fiscal year 1913. (Similar to Complt.'s Ex. 44, Delf, and made on same basis.)

Wherever iron ore is referred to on p. 15, Complt.'s Ex. 44, Delf, it refers to iron ore to Marquette dock, and includes none handled otherwise.

The iron ore not going over the Marquette docks appears in freight, other than interstate iron ore. Other ore business is done in Michigan by the South Shore. In fiscal year 1913, 1,031,902 tons of ore was shipped over the docks, and over 100,000 was shipped that did not go over the docks.

441 Neither the tons or ton miles stated against ore on p. 15, Complt.'s Ex. 67, Delf, includes any ore not passing over the docks; that is included in freight other than iron ore.

Page 16, Complt.'s Ex. 67, Delf, showing results of operation. (Similar to Complt.'s Exs. 45, 47 and 48, Delf.)

This statement corresponds with requirements of I. C. C. classification, but does not deduct interest on funded debt; it does allow estimated loss.

Item "separately operated properties" (loss) $69,222.29. This is due to operation of Mackinaw Trans. Co.

Page 17, Complt.'s Ex. 67, Delf, statement of operating results in Michigan. (Similar to Sheet 2, Complt.'s Ex. 45, 47 and 48, Delf.) It is made on the same basis as the previous exhibits.

Page 18, Complt.'s Ex. 67, Delf, statement showing results of passenger business in Michigan, applying estimated loss and divided between intrastate and interstate. (Similar to Complt.'s Exs. 45, 47 and 48, Delf, sheet 3.) It is made on the same plan and basis as previous exhibits; there are slight differences as compared with 1910 and 1911; in those years we were unable to divide excess baggage between intra and interstate business actually; in 1912 and 1913 we divided actually.

Page 19, Complt.'s Ex. 67, Delf, equation for division of passenger operating expenses between intra and interstate business for 1913. (Similar to Complt.'s Ex. 46, Delf.) My testimony regarding Complt.'s Ex. 46, would apply in principle here.

Page 20, Complt.'s Ex. 67, Delf, division of joint facilities revenue, between freight and passenger; it corresponds to Sheets 1, 2 and 3, of Complt.'s Ex. 35*a* and 36*a*, Delf; my testimony in connection with those exhibits, as to method, would apply here.

442 Page 21, Complt.'s Ex. 67, Delf, rents paid joint facilities divided between passenger and freight for 1913; corresponds to form of Sheet 2, Complt.'s Exs. 45*a*, 47*a*, and 48*a*, Delf, and the methods with regard to those exhibits would apply here.

Page 22, Complt.'s Ex. 67, Delf, hire of equipment, division between freight and passenger; this corresponds to sheet 2, Complt.'s Exs. 45*a*, 47*a* and 48*a*, Delf.

Page 23, Complt.'s Ex. 67, Delf, rents received (joint facilities) 1913; corresponds to same Exhibits as page 22.

Page 24, Complt.'s Ex. 67, Delf, miscellaneous rents apportioned. This page also contains statement of outside operations, sleeping and dining cars, for 1913. (This sheet similar to sheet 2, Complt.'s Exs. 45, 47 and 48*a*, Delf.)

Generally speaking Complt.'s Ex. 67, Delf, is made on the same basis as the showing for the years 1912, 1911 and 1910, introduced in various exhibits, and furnishes a good basis for comparisons of results. (The exhibit is offered in evidence.)

Complt.'s Ex. 68, Delf, is an estimate of the effect claimed to be produced by the act complained of in this suit for year ending June 30, 1913.

The net loss shown is: intrastate $127,790.65; interstate $50,745.43, total loss in Michigan $178,556.08; the corresponding ex-

hibit for previous years is Complt.'s Ex. 52; I believe they furnish a good method of comparison of the effect of the act for one year against the others.

"Mr. Butler: Exhibit 68 is offered in evidence.

Mr. Wykes: It is objected to as entirely speculative as not a subject for computation but as a matter which can only be determined by actual practice and actual experience and actually putting the
443 rates into test."

Since being on the stand before I have prepared an exhibit showing the division of operating expenses, between states and between freight and passenger for 1910 by primary accounts, Complt.'s Ex. 45, Delf, simply gave the division by totals. This exhibit, marked Complt.'s Ex. 69, Delf, shows the same results as Complt.'s Ex. 45, Delf, sheets 2 and 3, but shows the details by primary accounts. This was prepared according to the rule indicated by Complt.'s Ex. 41, Delf, heretofore in evidence.

"Mr. Butler: Complt.'s Ex. 69, Delf, is offered in evidence.

Mr. Wykes: It is objected to as being based upon arbitrary assumptions which are not the fact, and on the ground that it does not make actual divisions where possible and that it does not make divisions in accordance with the facts."

Complt.'s Ex. 70, Delf, is similar to Complt.'s Ex. 69, Delf, except that it relates to fiscal year 1911; this divides operating expenses between states and classes of service by primary accounts. It is made on the same basis as Complt.'s Ex. 69, Delf, is the details of the totals shown on sheets 2 and 3, of Complts. Ex. 47, Delf, and is made according to the rule indicated by Complt.'s Ex. 41, Delf, (offered in evidence subject to objections stated for Complt.'s Ex. 69, Delf.)

Complt.'s Ex. 71, Delf, the same as Complt.'s Exs. 69 and 70, Delf, except that it divides the operating expenses by primary accounts for the year 1912. (Offered in evidence subject to same objections as to Complt.'s Exs. 69 and 70, Delf.)

Complt.'s Ex. 72, Delf, similar to Complt.'s Exs. 69, 70 and 71, Delf, except applying to fiscal year 1913.

443*a* Complt.'s Ex. 73 is a statement of the freight traffic movement in Michigan for the fiscal years 1910 to 1913 by commodities, showing the freight which originated on this road, freight received from connecting roads and other carriers, and the total tonnage, and the percentage of each to the total. This classification of commodities is that prescribed by the Railroad Commission of Michigan, except that I have made a further subdivision by dividing the item "ore" so as to show the ore to Marquette docks as a separate item, that being an entirely interstate movement.

There are four different points of origin for freight. Part of it originates on the D. S. S. & A. Railway in Michigan, part on the D. S. S. & A. Railway in Wisconsin, and part is received from other carriers at Michigan junctions, and part is received from other carriers at Wisconsin junctions. Freight originating on our line in

Michigan is either delivered to consignees in Michigan on the D. S. S. & A. Ry. or delivered to other carriers at Michigan junctions, or carried into Wisconsin by the D. S. S. & A. Ry. Freight originating on our line in Wisconsin is either delivered to consignees in Michigan on our line or delivered to other carriers at Michigan junctions.

Freight received from other carriers at Michigan junctions was either delivered to Michigan stations on our line or delivered to other carriers at Michigan junctions, or carried into Wisconsin by our line.

Freight received from other carriers at Wisconsin junctions was either delivered to Michigan stations on our line or delivered to other carriers at Michigan junctions.

I have ascertained from the records of my office the Michigan intrastate tons received from each of the four classes of sources, and also the disposition of the same. I have ascertained like information concerning Michigan interstate tons.

443*b* Complt.'s Ex. 74 is a statement prepared to show the stational service given to freight other than ore to the Marquette docks for the fiscal year 1913 in Michigan.

The freight which originated on our line in Michigan and was delivered to consignees on our line in Michigan is all intrastate and received two stational services, one at the point of origin and one at the point of delivery. The stational service given to the intrastate tons of this class would be represented by the number of such tons multiplied by two.

The unit of service being the local service given in originating or delivering a car load shipment, which we will call a full terminal service, it was calculated that the service given at a junction point, of receiving from or delivering to another carrier a like amount of business, was one-fourth of the service given to the local business. Using that as a factor, shipments which originated on our line in Michigan got one full terminal service at the point of origin and 25% of one full terminal service at the point of delivery to the other carrier. Multiplying the total number of tons so originated and so delivered at a local junction point by 1.25 gives the volume of service given to the business. This does not relate to, and is to be distinguished from, the service of movement along the line, and is not affected in any manner by the distance the shipment moves along the line.

Freight originating on our line in Michigan and carried by us into Wisconsin is all interstate and gets one full stational service at the point of origin.

Freight originated on our line in Wisconsin and delivered to consignees in Michigan on our line is all interstate business and received one full terminal service in Michigan at the point of delivery.

Freight originating on our line in Wisconsin and delivered to other carriers at Michigan junction is all interstate business
443*c* and received 25% terminal service at the junction point in Michigan.

Freight received from other carriers at Wisconsin junctions and delivered to Michigan stations on our line may be either intrastate or interstate, depending upon its place of origin. Such freight re-

ceived a 25% stational service at the junction point where it was received from the other carrier and one full stational service at the point of delivery in Michigan.

Freight received from other carriers at Michigan junctions and delivered to other carriers at Michigan junctions includes both intrastate and interstate freight and received a 25% terminal service at the junction where it came on to our line and the like service at the junction where it left our line, making a total terminal service of 50%.

Freight received from other carriers at Michigan junctions and carried into Wisconsin by our line is all interstate business, and received a terminal service at the junction where it was received only—a 25% service.

Freight received from other carriers at Wisconsin junctions and delivered to Michigan stations on our line received one stational service in Michigan at the point of delivery to the consignee.

Freight received from other carriers at Wisconsin junctions and delivered to other carriers at Michigan junctions is all interstate business and received a 25% stational service at the point of delivery at the Michigan junction.

Exhibit 74 shows that the proportion of the terminal service given to the intrastate freight to the total is 55.3%, and to the interstate 44.7%.

Complt.'s Ex. 75 is a statement of the freight train mileage in Michigan for the fiscal year 1912, mileage of ore trains between Marquette and the mines not included. That mileage is shown by three classes of trains, local freights, time freights, and extras,
443*d* and is divided into two classes of service, called stational service and road service. 50% of the local freight mileage or time of service has been assigned to the stational service, 20% of the time freights, and 25% of the extra freights. Of the total service so divided, the result shows that 32.2% is stational service and 67.8% is road service.

These percentages which I have used as to the proportion of stational work done by the different trains is obtained from the testimony of Mr. Lytle and the conductors and confirmed by my own opinion. I am familiar with the operation of the trains, and it is my opinion that the percentages are conservative and low as to the proportion assigned to stational work. I am sufficiently familiar with the amount of traffic and the work at interchange to compare the amount of service required and the average interchange at junction points with the amount of service required on the average to receive or deliver freight from consignors or to consignees on our line.

Before I became auditor of the road, I was agent at a junction point, and handled the interchange work there, and also the local work, and I am familiar with the physical condition at the various interchange points in Michigan. In my opinion, the average volume of work or service required in receiving or delivering at interchange as compared with receiving or delivering at a station of origin

or destination on our line is less than 25% at the point of interchange compared with that at the point of origin or delivery.

Complt.'s Ex. 76 is a statement of the operating expenses in Michigan by primary accounts for the fiscal year 1912, showing, among other things, the operating expenses on freight other than ore to Marquette docks subdivided into three parts, the first being that part not separated as to road and stational expenses, the next into road expeness, the third part into stational expenses, and a final division on the exhibit of the expenses between the intrastate and interstate freight business.

443*e* We are not required to keep separate account of the expense of movement of ore to the Marquette docks, but we have kept that expense separately for the calendar years 1911, 1912 and 1913. We did that for the purpose of justifying an increase in our ore tariff in a matter before the Interstate Commerce Commission.

In preparing Ex. 76, it is found that certain freight expenses assign themselves between road and stational. For instance, the items in the maintenance of way and structures account are not divided between road and stational, whereas such an account as Station Employees, and the account of Yardmasters and their Clerks, are all stational. Out of the road accounts, including the wages of the freight train employees, fuel, etc., I assigned 32.2% to stational on the percentages arrived at in Ex. 75, which, in my opinion, is a fair and just way to make such division. A similar division was made of certain of the expenses under the head of Maintenance of Equipment.

In dividing the freight expenses between intrastate and interstate, we assigned all expenses under the head of "Not Separated as to Road and Stational" between intrastate and interstate on the relation of the intrastate and interstate ton miles to the total. We assigned the items under the column headed "Road Expenses" on a similar basis, this being the percentage most favorable to the defendants. The remaining column, "Stational Expenses," we divided between intrastate and interstate on the percentages arrived at in Ex. 74, assigning 55.3% to intrastate business and 44.7% to interstate business.

The general expenses were then divided between intrastate and interstate freight on an overhead basis.

I had these figures carefully made up, and gave it a lot of study, and I believe that it arrives at a fair result in the division between intrastate and interstate business.

443*f* Complt.'s Ex. 77 shows the Michigan freight revenue for the fiscal year 1912 divided between intrastate and interstate, the freight operating expenses divided between intrastate and interstate, and the net freight revenue from the intrastate and the interstate business.

Complt.'s Ex. 78 is similar to Ex. 76, except that it is for the fiscal year 1913.

Complt.'s Ex. 79 is similar to Ex. 77, except that it is for the fiscal year 1913.

Complt.'s Ex. 80 is similar to Ex. 75, except that it is for the fiscal year 1913.

(Complt.'s Exhibits 73, 74, 76, 77, 78, 79 and 80 introduced in evidence subject to the objections that they are based on arbitrary assumptions and opinions, which do not represent and which are not the facts.)

The $[illegible]5,000 plus of balance for rental of equipment would be entirely on account of interchange equipment. With a foreign freight car interchanged to and coming on to our road loaded with freight, I would first get a junction report rendered me, which would come each day, showing all of the cars, way bill numbers, and where billed from and to. If the car was going to a destination on our line, some days later I would get the original way bill, which accompanied the car, sent in by the agent at destination point. After the close of the month, I would get an abstract from the agent at destination, showing an abstract of that and all other way bills he had received. It would probably be an interline bill. We would check that rect would apportion the revenue between the lines to whom it belonged. It might be several lines. We would make a report covering all the business received from any one road for the month; they would make a similar report of all freight business received from us during the same month; the difference or balance would be
443*g* paid to the road to whom due. We would have to have an accounting with as many companies as the way bill read over.

In getting the empty cars back, we endeavor to get the cars back as soon as we can with a load; if we have not the business for it, we would have to send it back empty; the rule is to get it back to the same point from which we received it. I don't know the relation of empties to loads at interchange points. The empty movements at the junction point may be on local business. We endeavor to use our own cars and dispense with the use of foreign cars as far as we can. We sometimes have differences with other companies in regard to balances for freight business, which results in correspondence. It is work done and has been got down to a pretty good system, eliminating a great deal of correspondence.

The division sheets, for dividing freight revenue between participating companies, are prepared by the general freight agent, and if a new division goes into effect he sends me a notice, just the same as he would of a new rate. The division sheet is usually made by the line originating the traffic. The arrangement for division is made between the traffic officers of the two roads, which may be the result of a number of conferences and correspondence, and, after it is determined what the division is to be, one road or the other issues the division sheet. Those divisions are not changed much after once established, and our divisions with certain roads have been in effect, with very little change, for 15 years or more.

The proportioning of tariffs covering business on to and off our lines is, I should judge, a somewhat intricate matter. Those are filed with the I. C. C., which sometimes does not agree with the rates and now and then they suspend them. In fixing the local tariff, the complication of taking into consideration the rates of other
443*h* roads is avoided. Sometimes a local tariff is affected by the tariffs of other roads, where there is competition. I think,

though not based on experience, that it is perhaps as difficult to make a local tariff as one in connection with other roads.

I understand they ascertain from the other roads what their rates are, or what they are willing to participate in, and issue a tariff; this is probably done by letter. In making the local tariff, they must ascertain the rates of the other competing carriers, to know how to make a rate to secure the business.

The operation on an interchange shipment delivered to the Canadian Pacific at the Soo would be that we would deliver the car, accompanied by the way bill, on the interchange track, and the switching crew would take it across the bridge and deliver it to the C. P. R. That being treated as our business, we would pay cost of transfer. Business coming from C. P. R. to us is treated as their business. When we get cars from the C. P. R. into the Soo yard, destined to points on South Shore, the switching crew makes them up into trains, ready for the road engine.

The stational expenses, separated before division of freight into interstate and intrastate, comprise all of the expenses incurred at terminal points of the freight, where freight originates or is delivered, such as switching by train crews, dropping and picking up cars, unloading less than car load freight, the expenses of the station force in loading, unloading and checking freight, and in billing, expensing, collection of the charges, receiving orders for empty cars, procuring those cars, and notifying transportation officials when they are ready to be taken out from the point where loaded; and all work by station employees and train crews at stations in connection with the freight traffic.

I got this idea of setting aside the stational cost by a study of the situation. I know of no other case where it has been done.

443*i* The delivery point for our road on cars delivered to C. P. R. is on the Canadian side at the Soo. The distance across the river to be made by the switching locomotive to get the cars to the point of transfer would be a little over a mile. Our trains would stop at St. Mary's transfer, and the switching account locomotives would break up the train. In getting those cars across to the C. P. R., one of the most expensive bridges we have is used.

The cost of transfer would be about $1 a car. Only 29½% of that bridge is in Michigan, and only that part of the expense is charged into the Michigan expenses. It is paid by the company, but it doesn't enter into these exhibits showing the Michigan operating expenses. It is a cost of making the transfer which we have to pay to get the business to the C. P. R. at Soo, Ont.

At St. Ignace, the greater part of our interchange freight goes over the Mackinaw Transp. Co. ferry. We consolidate a good deal of freight into car load lots at St. Ignace. As far as practicable, north-bound freight destined to points on Soo Line would be consolidated by South Shore at St. Ignace and delivered to the Soo Line in the cars without transfer at Trout Lake. It might come to our line over the ferry in different cars, and those cars are unloaded and the freight that is to go to the Soo Line combined in a single

car, or cars, so as to make car load shipments to deliver to Soo Line, to prevent transfer of package freight at Trout Lake.

On Complt.'s Ex. 74, Delf, that business was treated as coming in class 3*b*. The consolidation into car loads would take place at the freight station on the dock at St. Ignace. To make it, the cars must be taken off the boats by a switch engine and taken to the station; another car must be placed beside the freight station, into which that freight is put after it is unloaded; after it is loaded into the other car, that car must be taken and put into the train; the empty car might be taken away empty or might be loaded with other freight depending on circumstances.

443*j* On freight on our line moving through St. Ignace, there is, if necessary, some consolidation of freight before it is delivered to the Mackinaw Transp. Co. to be taken to the Michigan Central or the G. R. & I. If there isn't sufficient in the car that arrives at St. Ignace to make a transfer, and there is freight waiting there to go across, it would be consolidated with that freight; if there is enough in a car to go across, it would not be consolidated.

Freight originating on our line for delivering to G. R. & I. or Michigan Central, including that for which consolidation has taken place, would be included in class 1*b* on Complt.'s Ex. 74.

The operation on a train through St. Ignace containing cars to be interchanged would be: Assuming 25 cars of freight, perhaps five or six of those would be for local delivery at St. Ignace and 15 for transfer across the Straits; the 20 cars would be set into the upper yard at St. Ignace by the train, which would end the connection of the freight train with the cars; the five cars for local delivery would be distributed to the various points; of the 15 cars per transfer, one or more might be less than car load, and, if not full enough to transfer across, would be switched to the freight house for consolidation; the balance of the car load freight, or bulk freight, would be switched directly to the boat. The freight we deliver to Michigan Central or G. R. & I. all uses that ferry, as does that received. I have never made a computation to ascertain whether the cost of transfer runs approximately $1.50 per car. If the less than car load freight was in a Michigan Central car, for delivery to Michigan Central, we would turn it over, regardless of the amount in the car. If part was going to G. R. & I. and part to Michigan Central, we would separate it.

I have no statistics showing the number of empty and loaded cars using the ferry in 1913. As far as the ferry is concerned, a loaded car is treated the same as an empty.

443*k* On a car coming to South Shore over the ferry at St. Ignace, if it were car load or bulk freight, it would be switched to the upper yard and put in a train. if less than car load freight, and to be concentrated, it would be taken from the boat and the movement would be as I have testified.

At Houghton, in delivery of a car to Mineral Range, it is the practice to take that car with a South Shore locomotive across the arm of Portage Lake and deliver it in the Mineral Range yard at Hancock. That is a mile, or a little more. That service is paid for by Mineral Range. It is a cost of the Mineral Range incident to delivery. The

South Shore engine and crew runs through to Hancock, and the South Shore bills on the Mineral Range for the service, and the expenses of the train from Houghton to Hancock.

On a car load shipment, business delivered to us at Sidnaw or Keweenaw Bay by a connecting company for delivery to a connecting carrier at Munising Jct., Sidnaw or Trout Lake would be under class 3*b* on Complt.'s Ex. 74.

Q. Under Mr. Lytle's testimony, a car of freight originating at Sidnaw or Keweenaw Bay would be picked up by a local and taken to Nestoria, and at Nestoria dropped by the local and picked up by the time freight. Assuming that I have stated correctly the operation at Nestoria, what train movement would there be for dropping it and for picking it up?

A. For dropping and picking it up where, at Sidnaw?

Q. At Nestoria. that is, the local would have to switch it out, break the train in two and switch it out into the sidetrack, would it not?

A. If your statement is correct as to that being the train, that would be the movement.

Q. And then when the time freight came along, the time freight would have to stop and break up this train and pick it up, would it not?

443*l* A. Under the same conditions, yes.

Q. Now, the time freight would bring it through to Marquette, and, assuming it to be destined for one of these places that we have previously mentioned, these points of interchange in Marquette, it would be again dropped by the time freight, which would involve the same operation in taking it out of the train, the same operation in putting it into the local, from which it proceeds from Marquette to Munising Jct., Trout Creek (Lake), or any of those places?

A. Regardless of what train brought it into Marquette, they would have to drop it at Marquette, as none of the freights run through Marquette, whether it is local, time or extra, and a new train would be made up at Marquette to take it through.

Q. What would be the stational operation in Marquette on that car of freight, then?

A. The yard engine would have to switch it, put it into a train, provided the train that it came in didn't have all through cars; if it had all through cars, the train wouldn't have to be broken up.

Q. Assume that the freight was a time freight, coming into Marquette, and that this shipment was to be dropped at Shingleton. That would be taken by the local from Marquette, would it not?

A. I couldn't say what train it necessarily would be taken by.

Q. If it were taken by the local, and the train that brought it into Marquette were a time freight, it would have to be broken up, even if it were a full train?

A. No, I don't think it would. If it were a full through train, it would be only a matter of putting another engine on to it and continuing the journey east, instead of letting the one that brought it into Marquette go along with it.

443*m* Q. But that assumes there would be no stop of that train at Shingleton, which was not in the question.

For illustration, the movement involved in our taking a car of freight from the C. M. & St. P. at Sidnaw: Our train would have to take it off the transfer track, where it had been left by the St. Paul, and put it into. If there was no other reason to stop at Sidnaw, but for this car, it would involve stopping the train; it would involve taking the locomotive, or the locomotive and some cars, from the train, backing into the siding or transfer track, hooking on to the car, and taking it out on to the track and uniting it with the train.

At Bergland, a car load of freight would stand on some siding or mill track; to pick it up, they would have to detach the locomotive, or the locomotive and some cars, from the train, back up to that car, connect with it, come out on to the main line and connect with the train. That is typical of all picking up of car load freight at stations where it is not interchange freight. The operation described for Sidnaw is typical of taking it from a connecting line, except at St. Ignace and the Soo.

On shipments of telegraph or telephone poles to Oconto, Wis., over the St. Paul, through Sidnaw, if we haven't the empties, where there is a considerable volume of freight moving between certain points, it is often the practice to request the other company to furnish the empties. Those cars would come to us empty at Sidnaw. From Sidnaw, we would take them to the point where the freight originated; they would then be switched to the originating tracks. The shipper who wanted them would have to give us notice that he wanted a certain number of cars.

The operation with regard to ordering the empty cars would be the same as that where a shipper required an empty car for a single shipment which was not to be delivered to a connecting

443*n* carrier.

In Complt.'s Ex. 76, Delf, we have used 32.2% as representing the time of certain freight trains used in stational service. In applying that percentage to the item, Fuel for Road Locomotives, no distinction is made between the amount of fuel burned by a locomotive in stational service and in road service, making train miles. A part of the time spent by a train in stational service, the locomotive may be standing still. If they are switching cars, they have to keep their steam up to full efficiency, ready to hitch on to the train and start it, which takes more steam and energy, at that point, to start the train, than when running on the road. When a car is switching, it is not under the same load as when in motion on the track, but the locomotive is stopping and starting more frequently in making switching movements.

In getting stational part of repairs to equipment, we have assumed no difference in the movement of the cars in the train, and the movement in stational operation. It assumes an equality there, though, I think the greater repairs are necessitated by the switching and knocking around of the cars than the equipment gets on the road. However, in switching, they handle a single car or set of cars, and the rest stands on the track. It is the practice to make the train

up in station order, so that it is not necessary to handle the whole train when they are making switching movements. The cars being switched receive considerable wear and tear, while those waiting on the track receive no wear at all. The locomotive doing switching would undergo more strain than the normal road movement. You must start and stop it, and the change from inertia to motion creates the damage. I think there is no doubt that the switching movement would be a considerable item of expense in the wear and tear of cars, locomotive and track. I don't know whether it would approximate the road use. I do not believe any of the road locomotive switching was assigned to passenger service.

444 Complt.'s Ex. 81, Delf, statement of locomotive mileage in the several services for year ended June 30, 1913, and apportionment of value of locomotives. This separates Mr. Riggs' value for each locomotive in Michigan into each class of service on the mileage pro rata, in each service.

Locomotives 552, 553, 554 and 700 to 711 inclusive have been put into use since June 30, 1913. I do not know whether 43 was in use before that. Locomotives 552 to 711 have been put into use since June 30, 1913.

Locomotives 37, 38, 39 and 13 recently sold for, respectively, $1,700, $1,650, $1,700 and $1,200; 45 sold recently for $2 000. We credited additions and betterments with the total cost, of $13,-000, for 37 and 39. For 37, 38 and 39, Riggs shows a present value of $3,366 each. Locomotive 51 was put out of service and scrapped July 1, 1913.

The non-revenue mileage would include work trains, but no switching. In designation of classes, I. C. C. classification was followed. (Complt.'s Ex. 81, Delf, offered in evidence.)

Complt.'s Ex. 82, Delf, statement of treasurer's monthly cash and bank balances, July 31, 1901, to June 30, 1913. The average yearly balance for 12 years was $188,088.11; the average of the monthly balances by years was:

1902.....	$52,990.72	1908.....	$134,911.05
1903.....	77,812.41	1909.....	144,516.33
1904.....	147,868.05	1910.....	251,747.50
1905.....	302,580.37	1911.....	245,744.87
1906.....	249,286.11	1912.....	267,162.72
1907.....	176,900.95	1913.....	205,536.21

Those figures were kept in the regular course of business. We pay our regular pay roll men twice a month, since Sept., 1913; formerly, they were paid once a month, about the 24th, for the preceding month. I believe these balances were fairly typical of the average balances during the month. There is no record of time in a given month for the payment for supplies and material; it has always been difficult to meet the payments as they become due. We are hard up for money; some payments are deferred after vouchers are passed and in treasurer's hands, as he hasn't the money. All company receipts are put into the bank as they come in, and

445 out of that bank account is paid interest on funded and unfunded debts, advances to other companies, and investments. The monthly pay roll is from $120,000 to $150,000, varying with the season.

DELF.

Cross-examination:

Our trackage changes more or less from year to year, tracks going in and being taken out and moved from one place to another; that is so of the spurs for traffic purposes; they were in miles: 1910, 49.48; 1911, 50.68; 1912, 62.14; 1913, 66.37; increasing a little all the time. Those are net and do not indicate the tracks moved in the period. The cost of moving such track, and the loss due to moving them, is charged to operating expenses under roadway and tracks.

A local freight, Marquette to Soo Junction, would produce in statistics 108 miles of locomotive mileage. This is the actual mileage between terminals.

A time or through freight or passenger train between the same point would show the same locomotive mileage, 108 miles. The train mileage would be the same as the locomotive mileage, assuming no double headers or pushers. Both the train mileage figures and locomotive mileage figures, are the actual miles run by the trains between terminals, except a small amount of mileage allowed the locomotives at the terminal in going to and from the roundhouse.

The revenue locomotive miles include nothing for road-switching; the time spent switching at a single point over one hour, would appear in switch locomotive miles.

The road or revenue locomotive miles between terminals would cover the switching done at the stations during one hour, e. g.,
446 Marquette to Soo Jct. the 108 miles, actual mileage would cover the switching, no additional mileage put in for the switching.

"Q. Then in the application of your percentage of freight and passenger locomotive miles to steam locomotives repairs and steam locomotives, depreciation to divide between passenger and freight, you have taken no account of that greater use of the freight locomotive in stational work, which is greater than exists in the passenger service?

A. In making that division there has been no distinction between the passenger locomotive mile and the freight locomotive mile. They have been treated on an equality. That is in all instances true of places where I divided expenses between passenger and freight on the basis of locomotive miles."

Fuel for road locomotives under transportation expenses; we term that allocated; the total fuel furnished each locomotive is ascertained and divided according to the service in which the locomotives were engaged during the month, on the basis of locomotive miles. Where the locomotives ran in two services during the month that assumed the same amount and cost of fuel for making a locomotive mile in the freight service, as in the passenger service.

The amount of coal consumed per mile was:

	Cost, tons.	Freight, lbs.	Passenger, lbs.
1913	$2.96	141.30	82.28
1912	3.12	126.46	76.86

Water, lubricants and other supplies for locomotives were divided between passenger and freight on the percentages found for the fuel, on the theory that those things would naturally follow the use of fuel and the amount of heat and power.

In division between passenger and freight, of expenses which I have divided on the basis of revenue train miles, I have taken the actual revenue train miles, and have not loaded the freight train miles in any way for stational cost.

447 The switching locomotive miles (p. 4, Complt.'s Ex. 67, Delf) 357,998 for Michigan 1913, comprises the switching in the yards, and the road switching, where the time spent in road switching exceeded one hour.

Of the mixed train miles, of which on p. 6, of Complt.'s Ex. 67, Delf, 75% have gone to freight; that train does the same work as local freight, 50% of the amount of its time assigned to freight would be engaged in stational work.

In assignments of expenses I have not, at any place, assigned any part of the expenses of the Marquette shops or incident to the maintenance of the tracks into, or grounds around, them to Wisconsin.

The maintenance of way, and structures items of expenses, Michigan proportion, have gone up materially in 1913 over 1912. The amount of M. of W. & S. expenditures in Michigan, were: 1913, $581,520.42; 1912, $454,032.33; 1911, $418,276.45; 1910, $423,-863.39. The increase of 1913 over 1912 was principally occasioned by ballasting and repairs of bridges, trestles and culverts, and roadway and track items. The new stringers put on bridges throughout system in Michigan were treated as repairs.

The ballasting in every year is charged to operating expenses, except where it is done on new construction. This is regardless of whether there is an improvement in grade of ballast or an increase of quantities; no portion of it is charged to additions and betterments, and none ever has been on this line.

The addition of the new stringers in bridges would not produce a charge to additions and betterments unless the result of the addition brought the value of the structure above the original value. The fact of the increase in timber, in amount, unless it increased the

448 value of the bridge, meaning over cost new, would not be charged to additions and betterments; if putting in the timber increased the value of the bridge above the cost new, then the excess would be charged to additions and betterments. The fact that there may have been an increase in the present condition of the bridge, would not necessitate a charge to additions and betterments, but if it were something that increased the cost of reproduction of that bridge, or its value new, then you would make a charge to additions. If you substituted an entire new bridge for an old one, so much of the cost of the new one as equaled the cost of the old one, would be charged to operating expenses, and the excess to additions and betterments.

If in 1913 a wooden bridge which would cost to replace in kind $10,000, were replaced with a plate girder on concrete abutments, at a cost of $9,000, there would be no charge to additions and betterments, but would be a charge to operating expenses of $9,000; there would be no deduction from additions and betterments by reason of the additional $1,000.

Witness gives a statement of amounts expended by the road as operating expenses for bridges, trestles and culverts:

	Michigan.	System.
1913	$61,875.25	$90,162.02
1912	11,380.65	14,815.90
1911	12,481.01	15,913.17
1910	12,869.71	21,153.59

The amount charged to additions and betterments on account of bridges during the same years, was

1913	$71,355.96	$79,571.99
1912	.....	None
1911	.....	"
1910	.....	1,374.85
July 1, 1907 to June 30, 1913	.....	$69,754.53

There may have been some credit which reduced the amount for the period 1907 to 1913, below that for 1913.

449 The rule stated would apply to the replacement of all structures, but not equipment.

The expense of maintaining sidetracks and all items therein that would be charged to operating expenses would appear under general accounts, M. of W. & S. under sub-heads: superintendence, rails, other track materials, roadway and track, removal of snow, sand and ice, and bridges, trestles and culverts, if any. I have not been able to separate the costs or expenditures chargeable to freight on account of switches or sidetracks for any year.

In division of expenses to passenger and freight on revenue train mile basis, each revenue train mile, whether in passenger or freight service, carries with it an equal amount of expenditure on account of sidetracks and switches, except where they have been located to ore. That would be true of such track as spurs given under "branches," e. g. Fiborn Quarry or Danaher spur; the maintenance of all those tracks is included in the general maintenance account, and I have not separated any of that before applying the revenue train mileage basis.

Stationery and printing. Includes stationary supplies, printed books, blank forms, rate sheets, tariff and division sheets and the cost of their printing.

The rate division sheets are used to arrive at the division of rates, passenger and freight, between carriers. There would not be a great deal of work in fixing the proportions and making adjustment between companies after the division was once fixed; in making the divisions on these sheets there is monthly work in the accounting depart-

ment; about 6 clerks, out of about 36 in the accounting department and a part of my time, is on that work. The amounts of the division between carriers go onto our books. This involves a mutual
450 rendering and settlement of accounts and payment of balances; the money we collect for other companies in both the passenger and freight service in connection with what is due us, we distribute, showing the amount due other companies and render them a statement of that amount; they do likewise with us. The division is made in bulk as much as possible. E. g. the business on coupon tickets, Marquette to Detroit, in a single month, would all be divided in one transaction. The tickets are grouped together by months between various points. This is also true of freight way bills. This involves an examination of each way bill and ticket for the purpose of grouping them; this is done by the station agents. They make monthly reports of the passenger business through their stations.

They make monthly freight reports. We get a tissue copy each day of the way bills, issued at our stations; we file them in a book by issuing stations, we revise the charges to see whether they are correct, make the necessary changes to make them conform with the tariff, notify the agents who issue them and the receiving agents of such changes, and file a bill to use at the end of the month in revising the abstract which would be sent at the end of the month.

On passenger business a few stations make daily reports. They make a daily report showing the daily ticket sales and also the total earnings of freight forwarded, for the purpose of enabling us to make an estimate daily of the passenger and freight earnings; that does not contain the details of the ticket sales.

Complt.'s Ex. 67, Delf, p. 12, general expenses; that includes for fiscal year 1913 $23,690, as expenses of this litigation. It does not include anything for my time, that of Mr. Eldredge, or witnesses who are also employees of the company.

That includes $12,000 paid Mr. Fitch, former president
451 of the company, who was not in the active service of the company in this year; he was president many years up to 1911; the amount paid him in 1913, was the same amount as he had previously drawn as salary for a similar perior.

(Witness corrects previous testimony in which he stated the cost of taking out spur tracks was charged to operating expenses; he now says it is charged directly to profit and loss, referring to I. C. C. rule on this subject.)

Complt.'s Ex. 67, Delf, p. 15; iron ore to docks; average distance hauled 17.15 miles. This mileage is from each mine, to the dock at Marquette. The average distances of haul on other classes of freight on sheet 15, Complt.'s Ex. 67, do not take into account the distances travelled on sidetracks or spurs.

Complt.'s Ex. 67, Delf, p. 16; outside operations; the losses on dining car service for 1913, were $11,606.49; the charges against that service are just those required by I. C. C. classification and include nothing for locomotive service or wear and tear of tracks or

M. of W. & S. or anything of that kind, just for the operation of the dining cars exclusively. The sleeper service showed a net revenue of $12,331.81, but includes no track or haulage expense or anything of that character.

Complt.'s Ex. 67, Delf, sheet 16; separately operated property loss, $69,222.29; this is the loss on account of the Mackinaw Trans. Co.

We keep a record treating one passenger car over Mackinaw Trans. Co. ferry as equal to two freight cars, to make a further distribution of expense between ourselves and the Soo Line.

The Mackinaw Trans. Co. gets the revenue from passengers; this was, June 1912 to April 1913, $44,060.50. The number of passengers could be approximated by multiplying this amount
452 by two, as 50¢ is the fare. For the 10 months, June 1912 to April 1913, the gross operating expenses were: $107,920.62. The other earnings of the Mackinaw Trans. Co. were: mail $1,478.55, express $2,231.63; baggage and miscellaneous $785.10; freight $2,386.79. The expenses given include taxes but not the cost of new boat or sinking fund. The income from freight is from freight moving locally between St. Ignace and Mackinaw City, and not passing over the railroads. Freight passing over the railroads bears no additional charge for the use of the ferry in transfer.

Complt.'s Ex. 69, Delf, item superintendence under M. of W. & S. the Michigan proportion divided between passenger and freight on revenue train mile basis. That was done because it was deemed to be fair and equitable method of dividing it—because it was considered that the revenue train miles fairly measured the service given to the passenger and freight departments. A part of that expense was rendered necessary by wear and a part by weather.

Q. Now, what has the revenue train mile to do with the portion of that expense that is caused by weather?

A. The revenue trains use the property that is deteriorated by weather.

Q. But the cars use them likewise?

A. They do.

Q. Why didn't you do it on the car mileage basis?

A. Because the trains are made up of the cars; the trains are a unit.

Q. Not of the same size?

A. No.

Q. Not of the same weight?

A. No.

Q. And not of the same speed?

A. No.

Q. And not of the same wearing effect as to weather conditions, in other words, the movement does not have anything to do with this weather expense?

453 A. The movement of the train does not control the weather.

Q. Nor does it control the expense that is rendered necessary by the weather effect on these tracks?

A. No, the movement of trains does not control that.

Q. A proportion of the cost of these items was due to wear. Why, with respect to the part due to wear, did you divide on the revenue train mileage basis?

A. Because we considered that the train mileage basis fairly measured the portion of the expense assignable to the two classes of business.

Q. But your units of use in the two different classes of service were not on the same number of wheels, were they?

A. No.

Q. Nor of the same weight?

A. No.

Q. Nor of the same speed?

A. No.

Q. What test have you made to determine whether those units, the freight train mile on the one hand and the passenger train end on the other hand, would produce the same wear on track or the same effect in requiring expenses for maintenance of way and structures?

A. It has been impossible to make any such tests.

Q. A part of this superintendence embraced in this item was superintendence of repairs on sidetracks was it not?

A. Yes.

Q. And on branches on which no revenue train mileage is made?

A. Yes.

Q. And on the eight miles main line on which no passenger mileage is made?

A. Yes, about that.

Q. Will you tell me what the revenue passenger train mileage, has to do with the wear or with weather deterioration and
454 the cost of repairs thereby, upon sidetracks, branches or main line not used in the passenger business?

A. It is impossible to ascertain the amount of superintendence applicable to those tracks and it is considered that the revenue train mile fairly measured the maintenance of all the tracks as there are off-setting features, off-setting items and costs to the amount of expense which might be brought into that account or, owing to the cost of superintendence of those non-passenger tracks, brought about by the use of train mile basis. The off-setting features some of them being the greater speed of the passenger train on the main line tracks, the elevation of the tracks at curves the widening of the gauge at curves for the accommodation of the speed of the passenger train, the greater speed, the removal of snow and ice, freight trains waiting for passenger trains, company's freight carried in freight trains part of which is used in the passenger service. It is impossible to ascertain what proportion of these expenses should be charged to the passenger business.

Q. Do you know what weight you would attribute to any one of those elements which you have spoken of, taken separately?

A. I could not express it in figures.

Q. You can only express it in an opinion?

A. In a general way.

Q. You cannot express it in a percentage?

A. No.

Q. Do you know what influence or weight any two of them would have?

A. No.

Q. Or any combination of them?

A. No.

Q. Without taking them all. Will you tell me how, if you cannot by any combination of them without all of them determine the weight or influence, you can tell what weight all of them
455 should have. As a matter of fact you cannot tell it as anything but an approximation can you?

A. No, I cannot.

Q. In the passenger service where do you find any item of any other expense which is comparable with the element of this item of expense in the freight side of your expenses due to maintenance of sidetracks, of branch line and of main line, not used in the passenger business?

A. Comparable in class of service or in amount of cost.

Q. Either; state it to suit yourself?

A. In the amount of cost I should say that the items I have enumerated would approximately compare or balance with the cost of maintenance.

Q. You must have in mind the items you have enumerated which make for greater cost on the freight side and there were other items which you enumerated which make for greater cost on the passenger side. Now, I am saying, take those you have put on the freight side, take from them the cost of maintaining exclusive freight track and you do not think what is left would balance. But you do think that it is necessary to put in the exclusive freight track and its cost of maintenance to make the balance, is that correct?

A. I think by putting them in and making a division on the revenue train mile of all of the maintenance of way and expense that you do get a fair balance between the passenger and freight, including and off-setting those items of freight expense that should be charged to passenger expense.

Q. Then you think it is necessary to put exclusively freight track and sidings in to weight the problems on the other side?

A. I think it does that.

456 Q. You think it is necessary?

A. If the cost of those items on both sides could be ascertained it would not be necessary.

Q. But they cannot be ascertained?

A. They cannot.

Q. But in applying your judgment you think the putting in of the exclusively freight property on the freight side must be put there in order to properly weight the problems to make them equal?

A. In the absence of any means of getting at it.

Q. Then the revenue train mileage basis in that interpretation would not be fair on a road which had no exclusive freight mileage would it?

A. In that case there should be some consideration given to those items of expense in the freight service that were properly chargeable to passenger?

Q. You know, do you not of this revenue train mileage basis being used on roads in keeping accounts where there was no exclusive freight mileage other than a few exclusive said tracks?

A. No, I do not.

Q. You don't know whether there was or not?

A. No.

Q. Do you know whether the situation of the South Shore in the amount and value of the exclusive freight property is exceptional or not?

A. No, I do not.

Q. You don't know anything about that?

A. No.

Q. You don't know and did not investigate that?

A. Why, I do know in a general way that other roads, a great many other roads, have a large amount of exclusive freight property.

Q. But you made no comparison to determine it?

A. No.

457 Q. And you made no comparison to determine if where the revenue train mileage had been used, conditions were comparable upon this particular item of expense?

A. No, I did not.

Q. Now, apply the revenue train mileage basis to practically every item under the maintenance of way and structures account, in your division between passenger and freight?

A. Yes, excepting docks and wharfs.

Q. Can you point out any items under that account which does not exist in side tracks or in the branches used exclusively in freight, on the South Shore?

A. Outside of the docks and wharfs I think they all relate more or less to such tracks.

Q. They would all include some part of the expenses?

A. Some portion of it, yes; a very little as to bridges, trestles and culverts, possibly none.

A. The cost of putting in switches and changing them comes under "Roadway and Track," and the material under "Other Track Material."

Q. In which of the items under the same general account would "Yard and station costs" come?

A. Maintenance of yard and stational costs? What do you refer to by stational costs?

Q. I assume there are some stations where you haven't any yard trackage there. I am not talking about stational costs incidental to the operation and nothing else except those, that would be under maintenance of way and structures.

A. The rails put in a yard track would come under "Rails" the cost of putting them in would come under "Roadway and Track" repairs of station buildings under "buildings, fixtures and grounds."

Q. There would be some of that nature of expense in practically every one of the accounts of this subdivision?

458 A. What nature of expense?

Q. The yard and stational expense?

A. Any of these primary account items, if the work which they describe is done in the yard then there would be some of that expense in the accounts.

Q. And it is customary to do work of the character that would follow under these items in yards is it not?

A. Whatever is necessary.

Q. With the exception of docks and wharfs, I assume?

A. Yes, I think that is probably all. It may be bridges, trestles and culverts; there may be a very little of that if any, there may be under "culverts" perhaps.

Complt.'s Ex. 72, Delf: General account transportation expenses, item station employees; of these we were able to locate to passenger for 1913 $10,746.06. That included compensation of employees selling tickets at stations and dealing with the passenger work at stations exclusively; the agent at Seney for example, would be allocated as common. We were able to allocate the station employees to passenger at St. Ignace, Marquette, Houghton, I believe at Ishpeming, and there might be others. I think we did not allocate to passenger any employees who did anything in the freight service; we endeavored to and I think did, confine it to the men doing exclusive passenger work.

The unallocated amount, under "station employees" was assigned between passenger and freight, on the revenue train mile basis. These men have a great many duties that are not connected with train movements e. g. making up various reports, reports of passenger and freight movements, monthly reports, taking in freight, and issuing way bills, and the general duties of the station. Whether

459 they do anything not connected with the movement of trains, depends upon whether the operation of the road, is considered to be directly in connection with the movement of trains, general operations. It all enters into, or in some measure grows out of train movement as a result of their labor.

Complt.'s Ex. 72, Delf; transportation expenses, items beginning "yardmasters and their clerks"; that and a number of following items are allocated on the basis of 10% passenger and 90% freight.

Q. Did you make any tests since you gave your previous testimony to verify that percentage?

A. I got some figures, but I have not summed them up.

Q. And you have not made any change in those on account of what investigation you have made — them?

A. No.

Q. When you get that summed up we will be pleased to receive it, if you wish to deliver it.

The car accountant keeps a record of cars and their movements. Correcting this morning's testimony, his expenses would be under "transportation expenses, clerks and attendance." This is a considerable item. He gets a report every day from each train conductor,

showing by number all the cars that train has handled, where taken on, and where dropped. He keeps a record of their movement and mileage.

For our cars on other lines he gets a report when a car goes off our line into another line, and a report from that other line if they deliver to still another, and so on, until the car gets home. For
460 foreign cars on our line we report by mail the disposition of their car when we d iver it to some other line. There is a considerable number of our cars that would be off the line and a great many cars of other lines on the South Shore.

This making and receiving of reports involves a considerable amount of work; there is a car accountant and several entry clerks. That expense has been assigned between passenger and freight on the revenue train mileage basis; for the year 1913 with 67 of the cars passenger and 3,303 freight, I would say that the ratio of his attention to these cars would not be 48% and 52% or any percentage near that, but the ratio of allocation would be to cars, and it would be very much greater for freight cars.

Complt.'s Ex. 72, Delf; Shop expenses are spread over the items of expense under maintenance of equipment; the superintendence has been assigned between passenger and freight on the Michigan revenue locomotive miles; the number of locomotives on June 30, 1913, was 97, distributed: to passenger 32, Freight 52, and switch 13. The rail use of locomotives would be shown by Complt.'s Ex. 81, Delf.

The freight cars are repaired in the use of this superintendence all over the line; probably over one-half of it is done in Marquette; correcting previous statement, the superintendence applies only in Marquette shop.

Q. With Marquette shop used in repair and renewal of about 87 passenger cars and one-half of upwards of 3,000 cars, do you think locomotive mile basis fair for that division of superintendence?

A. The principal cost of that superintendence is in connection with the locomotives; a large amount of the freight car repairs—one half—is done out of the shops, and a large amount of that done in the shops being rough work, requires no superintendence; the superintendence is concentrated on the repairs of the locomotives or the higher class passenger cars. I did not take into account the
461 fact that there were 30 times as many freight cars receiving repairs as passenger cars; they could repair 30 ore cars without a particle of superintendence, as against one locomotive, passenger car or sleeper, requiring close supervision, with a lot of superintendence.

(Stipulation: Objection to competency of Riggs to testify as to value of locomotives and rolling stock appraised in Complt.'s Ex. 1*a*, pp. 123 to 129, withdrawn. It is admitted that Mr. Anderson is qualified to and would, testify to the values there stated, and that said exhibit shall be treated in evidence with the same force and effect as though Anderson had appeared and testified to the correctness of the values for rolling stock and locomotives therein stated.)

We have no passenger trains running east of the Soo, Michigan;

all the passenger trains that terminate there are unloaded at the Soo; the joint Soo line and C. P. R. train, stands at our station and takes the passenger going further east. Our train arrives a little before the Soo line train, so the passengers use the station. I believe the C. P. R. has 4 trains per day into our station at Soo—2 each way. All of the passengers, except immigrants in through cars or colonists sleepers from the east over C. P. R., who go west on our line must unload and reload into our cars at Soo, and use our station for that purpose. We pay mileage on the colonists sleepers while they are on our line; we have an immigration station used by immigrants where they don't come in through cars, and have to make the transfer.

Complt.'s Ex. 81, Delf; does not show the switching of the road locomotives separate from the yard switching. It shows all switching mileage of each locomotive, regardless of the service it is
462 in, and includes the switching made by the road locomotives at stations in excess of 1 hour, but not as a separate item. I cannot tell what the road switching for road locomotives would be.

The increase in M. of W. & S. expenses in 1913 over 1912 was in considerable part in roadway and track and bridges and trestles. The increases in roadway and track expenses was: entire line $19,046.19; Michigan, $22,631.55. If a switch were taken out and a different type put in in 1913 the expense, to the extent that the new replaced the old, up to the original cost of the old, or cost of replacing in kind, would appear in item roadway and track, unless the cost was more than $200.

On additions and betterments unless the charge is $200 or more, you make no charge to additions or betterments, e. g., assume it would cost $300 to replace an old switch, and you put in a new one at a cost of $400, the entire charge would be to operating expenses as the excess cost was only $100; if the cost of the new switch was $500, then $200 would go to additions and betterments.

Assume a wooden pit cattle guard taken out and replaced by a new type and that the cost of the new type was $50, the charge would be to operating expenses.

A part of the ballasting expense, including cost of application, putting in new ties and such costs as are incident to getting the ballast under the ties would be charged to roadway and track. The item ballast, includes all expenses incident to the purchase and production of ballast and delivering it to the point of use, and the labor of putting it in is under roadway and track.

The expenditures for grade crossings, fences, cattle guards and signs, increased in 1913 over 1912 because there were more replaced; more maintenance in 1913 than 1912.

463 The item roadway, tools and supplies increased in 1913 over 1912 because more maintenance and more tools — used in performing the work. The item superintendence, increased materially in 1913 over 1912, due to the fact that more work was done in 1913 than 1912. The increases, under maintenance of equipment, steam locomotive repairs, passenger train car repairs and freight train car repairs, in 1913 over 1912, was due to the fact that there were more repairs.

No part of the cost of labor of putting in the increased weight of rail $18,601, in 1913, was charged to additions and betterments and no increased cost of handling and transportation on rail of this character over the lighter rail was included in additions and betterments.

The figures on page 14, of printed report for June 30, 1913, and similar figures in other reports, for additions and betterments are the actual costs of putting in the new structure; that does not mean the entire cost goes to additions and betterments; that it is the actual cost of the addition or betterment portion; it is not necessarily the actual cost of replacement.

"Q. In expense, Mr. Delf, what expenses occur directly in producing a train mile?

A. The wages of the train crew, fuel, water lubricants and other supplies for locomotives; the wear and tear of your track; all of the expenses under maintenance of way, equipment transportation, contribute to the cost of production of a train mile.

Q. The direct costs of producing the train movement and the train mile, leaving out the trackage cost, are those you first mentioned?

464 A. Well, the items under transportation expenses, dispatching trains, superintendence.

Q. And the fuel?

A. All the road expenses.

Q. Labor, water, lubricants and things of that character?

A. All the items to road enginemen, engine house expenses, road, fuel for road locomotives, water, lubricants, other supplies, road trainmen, train supplies and expenses.

Q. Those you have stated you have been able to directly allocate not the dispatching, but the fuel, the water and things of that character?

A. The road enginemen, fuel, the water and lubricants, being assigned on the fuel basis, on the basis of the fuel.

Q. The percentages that would be found by the amounts directly allocated to those particular expenses, should very closely approximate the percentage of the revenue train mile, should it not, if the revenue train mile is a proper basis for apportionment of other expenses?

A. No, I don't see that that follows. I don't see that they should.

Q. Those are the direct expenses, the most direct expenses of producing the train mile, are they not?

A. Yes.

Q. And if the most direct expenses of producing the revenue train mile, do not approximate the percentage reached on the revenue train mile, it rather indicates that the revenue train mile basis is not as good as some other, does it not?

A. No, I do not think it does. I would not agree to that.

Q. You think the revenue train mile perhaps gives more assurance of being correct than direct allocation?

A. I don't see what relation the expenses of fuel for road locomo-

tives, water for road locomotives, and those things, have to do with the repairing of fences or ditches or station buildings.

465 Q. I think you have stated that the revenue train mile does not produce the deterioration there, it is produced by weather and the basis of the revenue train mile is an arbitrary basis for division. I am trying to get to the question of whether that arbitrary basis is proper, by indicating to you that where you have been able to assign directly the costs most nearly related to the production of that revenue train mile, they do not approximate the revenue train mile basis?

A. On your suggestion if we allocate the road enginemen and the road trainmen and arrive at a proportion of 40 passenger to 60 freight, other expenses that come under there are the yard expenses, and taking it, would divide the same way 40 to passenger and 60 to freight; they come under the same head.

Q. The yard expenses you divide 10 to passenger and 90 to freight?

A. My statement would follow if your suggestion, method of dividing them, was followed, if we took the percentage arrived at from things that we could allocate and applied that percentage to other things.

Q. I am not suggesting that you follow that basis, but I am asking you if it is not a proper criticism of the arbitrary revenue train mileage basis, because those expenses which you can directly allocate and which directly produce the revenue train mileage basis, allocate themselves on a different basis and indicate a different percentage of cost in producing the revenue train mile of the different classes?

Mr. Eldredge: Do you say that, or ask the witness to agree to it?

Mr. Wykes: I am asking him if it was not a proper criti-

466 cism.

A. I don't think it would be proper to apply the ratio of fuel for locomotives, road enginemen, road trainmen to the interlockers, block and other signals, crossings, flagmen and gatemen, telegraph and telephone operations, stationery and printing of dispatching trains or superintendence, which are the only items under transportation expenses which are divided on Michigan revenue train miles.

Q. I haven't suggested that you divide on that basis?

A. You are asking me if it wouldn't be proper to divide these other items on that basis.

Mr. Eldredge: No, he is asking you whether the fact that a different ratio is arrived at by actual allocation, does not indicate that the road mileage basis is wrong for those items of expense which you have divided?

A. The Michigan train mileage basis?

Mr. Eldredge: That you have allocated on a train mileage basis?

A. No, I don't think it indicates that.

Q. Those you were not able to allocate directly?

A. The items I have——

Q. And you necessarily take an arbitrary basis?

A. Yes.

Q. You took an arbitrary basis which is composed of unequal elements which no one has been able to reconcile and which depends upon judgment, to say that they are equal. Now the point I put to you is that: considering the uncertainty of the correctness of that due to the fact that it cannot be determined, what weight should be given to the unequal elements on the one side and the unequal
467 elements on the other side; isn't it a criticism of that thing that rests solely in judgment, that the expense which directly produces the revenue train mile, allocates itself in a different way than that judgment that you have applied to this arbitrary thing, would indicate?

A. I don't think it is any proper criticism.

The Master: Will you explain your reason why you don't think so?

A. Because I do not see that there is any relation between the two.

Mr. Eldredge: Explain in detail what you mean; take up the items that you have divided that way and explain to Mr. Baker what you mean and the reason why you think the train mile does allocate properly?

A. Take the item superintendence.

Mr. Eldredge: Just take under maintenance of way and structures and name the items that are divided on the train mileage basis if you want to understand him, I think if you would follow that thing and see what he has allocated on that——

The Master: He could take a single item and illustrate by that.

A. Take the renewal of rails, renewal of ties, I cannot see that the wages of road enginemen in passenger service, road enginemen in the freight service, would bear any relation to the renewal of rails and ties.

The Master: Take another item?

A. The same of removal of snow, sand ice, that would be done by section men and by work train crews. I don't see that the relation between the passenger road enginemen wages and the freight road enginemen wages would be a proper basis to divide that between passenger and freight; the same way all through.

468 Q. Here you have got your tie in the track and part of this, the cause of its renewal and maintenance is weather, and part is wear, and you have to use some arbitrary basis to find out what goes to one service or to the other, and you say it is the revenue train mile because two different classes of trains pass over it, but those you admit are of unequal weight?

Mr. Eldredge: If you make it clear at all so that any one can follow you, confine it first to your weather.

Mr. Wykes: They both enter into it.

Mr. Eldredge: They both enter into it, but they enter into it in a different way; for instance, it would seem, to me that the revenue train mile basis absolutely allocated, so far as weather stress is concerned, whether the other did or not might depend upon a different state of facts.

Q. Read the question to there please. (Question read.) They are of unequal weight, they are of different number of wheels, they are of different amount of tractive force in the locomotive, they are of different speed, and you say that they are equal; now then, you take on the other hand, a force which produces the wear that is found in the consumption of coal, the force that draws the weight, the force that produces the wheel impacts, and we find that that force in the shape of coal allocates itself upon a different ratio; we find that repairs to the moving thing that produces the wear of track, allocate themselves on a different basis than the revenue train mile basis, isn't that a criticism in your judgment of the revenue train mile basis?

A. No, I don't think it is.

Q. Did you make any study of the number of curves on the South Shore, or the degree of elevation, or anything of that char-
469 acter, before you reached your judgment on this revenue train mileage?

A. No, I didn't go into the number of curves or the degree of elevation.

Q. Did you make any investigation of that in any way, that is to determine what degree of curve would be required by a passenger train moving at a certain speed or by a freight train moving at a certain speed?

A. No, I discussed those matters with our engineers though to ascertain that they were facts.

Q. What facts aside from conclusion of equal wear or of greater wear by one service than another did you find; what facts?

A. As to the facts of the elevation and the facts of the widening of the guage at the curve.

Q. But you did not find anything about the degrees of elevation?

A. No.

Q. Or things of that character?

A. Not the engineering technicalities.

Q. Did you make any study of train weights?

A. No.

Q. Did you make any study of train speeds before you prepared the tables with regard to freight and passenger train speeds that you produced heretofore?

A. Except in a general way, to see what the general relation was between the freight and passenger train, which traveled the faster on the average.

Q. Did you make any investigation of the different types of locomotives used in the different services?

A. Yes. I have tried to keep posted on that somewhat for a good many years.

Q. What are the types of locomotives used in the pas-
470 senger service?

A. You mean by types, any particular name, or do you wish the locomotives?

Q. Well, no, I mean the types of locomotives that prevail in the freight service and in the passenger service. Now, assume that your

passenger service is served by an American type locomotive, assume that is the prevailing type, just describe it?

A. Well, I cannot describe those locomotives by types.

Q. Do you know that the prevailing type of locomotives used in the South Shore passenger service is an eight wheel American type locomotive?

A. I don't know that I can state what it is by name of type.

The Master: Are there recognized types of locomotives?

Mr. Wykes: The different types I think have different number of wheels, different length of wheel base and things of that character.

The Master: Is there a classification according to type?

Mr. Wykes: As to the wheels.

The Master: Classification as to the wheels.

A. I cannot give you those classifications without referring to our records.

Q. What is the prevailing type used in the passenger service?

A. I don't know those locomotives by their types.

Q. What is the prevailing length of wheel base in the passenger service?

A. I cannot really testify in regard to those things, locomotives.

Q. Do you know that ordinarily the passenger locomotives have a rigid wheel base of about 8 feet and 6 inches, and the freight locomotives have a rigid wheel base of something like 15 feet and 6 inches?

471 A. The wheel base being from driver to driver?

Q. Yes. You don't know that?

A. I should judge that was about right from my knowledge of the engines.

Q. Did you make any study of the different degree of wear on track on curves, due to the difference in wheel base?

A. Now, what information I have got I obtained from consultation with our engineers and trackmen.

Q. You didn't go into the detail of that?

A. No.

Q. You don't know what wear one of those locomotives would produce as against another?

A. No.

Q. And you don't know what wear a passenger coach would produce on the track as against a freight car?

A. No."

Official cars are principally hauled in regular passenger trains; both classes of trains carry the employees of the company from one point to another; in the superintendence of maintenance of way they travel a good deal on both classes, though on passenger trains where convenient; in inspecting track if a freight train comes along and they want to go to another place they take it; their movements would often be short, from where one gang of men were working to another.

The auditors and company officers travel usually in passenger trains; the persons carried on exchange passes are carried in passenger trains.

Complt.'s Ex. 67, Delf, p. 14: the average haul of intrastate passengers in Michigan of 32.48 miles is arrived at by dividing the passenger miles by the number of passengers; that took into
472 account the passengers from Marquette to the ball grounds, going out by special train of six or eight cars a couple of miles. On a passenger from Soo Jct. to Marquette, paying his fare on the train, depending on the train he was on, he might pay to Soo Junction and Soo Junction to Marquette, and we would get him as two passengers on this computation. A passenger St. Ignace to Marquette, on certain trains would pay to Soo Jct. and then pay again from Soo Jct., and we would get him in as two passengers. There are other points through Marquette, e. g., where if a man traveled on a local on the line there would be a change, of conductors and two cash fares taken.

The man in each instance, including those Soo to Marquette and St. Ignace to Marquette, takes another train every time. Assuming he came through Marquette on No. 1 or 2, he would come through without changing trains or cars; if he paid a cash fare coming into Marquette that conductor would take him to that point, and you might get the man again for two fares on one trip. *As* Nestoria from the west coming east, the same thing would not occur.

"The Master: Then this haul on this would not be accurate would it?

A. It is in accordance with the way you have to make your statistics and reports.

The Master: Where you change trains you call that another haul, where you change trains?

A. If a man pays his fare you cannot keep track of that man.

The Master: If he did not change trains it would be one haul although you get two fares?

Mr. Eldredge: From our standpoint. How could we know that there was a distinction between them?

The Master: I was looking at it as a question of fact."

473 On an interline ticket, the accounting required would be: the ticket contains a printed form coupon, showing the roads over which issued, and upon which the agent writes the destination, unless it is printed, and the amount for which sold; this coupon he retains; at the end of the month he reports all such tickets, grouping all tickets from his station to the same destinations by the same routes, together, sends that report to my office and reports the total revenue collected on the various tickets, and we check it to see that it is correct, and apportion the revenue among the lines interested in the travel; in an extreme case there might be 8 or 10 coupons; reports are made by each company of the amount coming to it from the others and the balance paid by draft. Each company is settled with separately.

On a card ticket the process is: each night the agent goes through

his card case to see what card tickets are sold, makes a summary and records them in his books. At the end of the month he makes a report to my office of the card tickets to each destination, showing the commencing number to each station at the beginning of the month, and the closing number at the end of the month. The amounts are extended showing the numbers sold and amount collected on tickets sold to each station from his station; in my office, the report is checked with the individual tickets and recorded in the books.

His report of coupons or interline tickets are checked with the stubs, he makes a daily computation of amounts and makes a daily report from which we get our estimate of the daily earnings. On the interline tickets the general passenger agent of our road would attend to the printing, get up the proofs, and pay the cost. To sell one of those long form tickets takes longer than to sell a car ticket;
coupon tickets are often made so that he has to write
474 the name of each station to which sold on each coupon, and
stamp each coupon. He must detach the stub and enter the destination on it. We have a standard form for interline tickets in connection with each road and each company gets up its own form.

There probably would be more inquiry in connection with a long trip ticket than with a local ticket, and I presume more inquiry of the conductor about connections and things of that kind. He would not be informed of connections beyond our line, but if he is asked he can take his book and give them the information. I presume many people going on a journey of that kind ask for time tables.

The cost of printing the interline tickets is considerably greater per ticket than the cost of card ticket.

If you should go to any of our ticket agents and tell him you were going to use our line to New York, he would wire for Pullman reservations at the company expenses. It takes the time of the station man to send the message, and to get and communicate the answer. He would do the same thing on a ticket to Detroit or Bay City. We sell considerable mileage; the mileage pulled generally indicates the distance traveled on the trip.

A passenger to Chicago from Marquette, for example, on No. 11, unless in the sleeper would have to use the station and change cars at Negaunee. Passengers from the western division to Chicago on some trains would be required to use the station facilities at Ishpeming or Negaunee.

If in a certain year the intrastate passenger mileage increased 5%, and if our station forces, conductors and train service were there to force working up to their limit, we would have to increase them. If
they were not working up to the limit the additional cost
475 would be very small. The same would be true of a 10% increase, if the trains were not up to their limit. We could carry more passengers in each class, intra and inter state now, without perceptibly increasing our expenses. Take the line as a whole we could increase. If our passenger business should increase 20%, it would not increase the expenses very much, not nearly 20%. It would require the printing of extra tickets, would perhaps affect

the number of the train crew and we might have to run more trains, and increase station forces, and the auditing department somewhat.

DELF.

Redirect:

At the end of the day's work, the ticket agent must examine not only the compartments from which he has sold card tickets but for the preparation of his report also examine compartments from which he sold no tickets. He has to go through all of them to know whether the closing number is the same as the commencing number in the morning.

A passenger paying his fare to Marquette, and renewing his journey out with a different conductor and again paying his fare, could check no baggage.

All coupon tickets are not interstate; over 75% of them are intrastate. Intrastate coupon tickets result from the fact that we sell tickets on points on other lines in Michigan. The expense of handling those tickets is the same as that of handling an interstate ticket, except as the expense of handling the latter may be increased by the number of coupons. The selling and accounting expense of handling a coupon ticket is in excess of that of handling a card ticket. The difference is not great. The principal feature would be the time of the ticket agent in selling the ticket. And this would be greatly offset on the other hand by the difference of time in get-
476 ting his record on the local ticket as compared with the coupon ticket which is right before him. In places where all the tickets were sold by one agent, this would increase the work without increasing the expense. In the accounting department, in my judgment, the expense is about the same in each class of ticket.

In taking into consideration the volume of the passenger business, this account and stational expense of handling a ticket is not great, that is the expense of selling and accounting per ticket. The greater part of the passenger stational service is occasioned by selling and account- for tickets and checking baggage.

The Master: Can you form any idea of the percentage of additional cost or work that is involved in selling the coupon tickets as against the selling of the card tickets?

A. That is a pretty difficult thing to estimate. I do not know that I could venture a statement on that."

DELF.

Recross:

The ticket agent at a station of importance has the card tickets all in a case behind him where the face of each local ticket is exposed; I stated that this time in checking the sales out of that rack for the day was considerable.

"Q. He does it in ten or fifteen minutes doesn't he, or less?

A. I couldn't state the time."

If he has done a considerable amount of local ticket selling, he could not do it in 10 or 15 minutes, because if his sales had been varied, he must take down the closing numbers of his tickets, subtract them and extend the amounts and get at the total of
477 his sales on card tickets to each destination. With coupon tickets he would have his stubs before him, and would total them up for the day. On the card tickets he must find out what number of ticket he starts in with in the morning, and what number he left off with at night.

"Q. Where he has made no sales he knows from the pencil line previously drawn down across the ticket, does he not?

A. No, he pays no attention to that ticket. He has to look at them to see if the pencil mark is on there."

I have produced printed annual reports to stockholders for the system, without division to Michigan by fiscal years for 1905 to 1913 inclusive. (These marked defendants' Exs. 43*a* to 43*h*, 1911 and 1912 previously marked Complt.'s Ex. 39 and 40, offered in evidence and 1905 to 1909 inclusive objected to as irrelevant and immaterial.) Defts.' Ex. 43*h*, Delf, p. 6; printed annual report for 1913. The item "property investment," road $43,946,516, represents all charges into that account less credits, which have been made to the account since the beginning of the operation of the D. S. S. & A. I am not able to say how much of it represents invested money, as a large portion of it is stock and bonds that were issued in payment of completed road. I do not know on what basis the completed road was taken over for the bonds; I know the bonds and stock that were turned over, but do not know on what basis.

I do not know the relation which the amount allowed for the purchased property, bore to the actual cash cost of building the property that was sold; we have no knowledge of what the property actually cost, that is, that property that was acquired in exchange for the stocks and bonds. That was the consolidated roads in 1887;
$22,000,000 of stock and $4,000,000 of bonds were given
478 for a certain number of miles of completed road. I haven't the number of miles of road, something over 300, about 330 miles I think it was, of completed road. This, I think, include all the present main line, St. Ignace to Marquette; part Soo to Soo Jct.,—none to Marquette to Houghton; all Nestoria to Iron River, Wisconsin. It did not include Marquette and Western which was a part of the M. H. & O.; the total of $43,000,000 does include that; it also includes M. H. & O. lands now owned and those sold by South Shore Land Co.; there have been no credits to the account as lands have been sold. I have been South Shore Auditor since 1894. I do not believe there were credits to that account before 1894 for abandoned property, and things of that character. We make no credit for property, e. g., ore docks, cars or freight cars, worn out. The item, same page of printed report, equipment $4,-214,690, has been accruing since the beginning of the road; I do not know whether it represents actual cash investment, before I came in as Auditor; there were no credits made for equipment worn out or abandoned until 1907.

I do not know how fully the bonds of the previously existing com-

panies were recognized in the consolidation in 1887 and taken care of by the allowance of new stock or bonds; I do not know that for any of the companies entering into that consolidation. I have no knowledge so that I can explain the increase in reported cost of road between 1886 and 1888. The D. M. & M. report to the Railroad Commission for 1886, shows a cost of property of $3,011,205 for 150.8 miles, which would be $20,000 a mile in round numbers; the D. S. S. & A. report for that property for the next year and reported by the Railroad Commissioner in 1888 shows cost of road increased to $26,000,000, the mileage increasing to 197, thus increasing the cost per mile from $20,000 to $134,000.

479 I have no knowledge or information whether, in the consolidation of 1886 or 1887, after the foreclosure of the D. M. & M. mortgage, its common stockholders received 60% of their previous holdings in the stock of the consolidated company.

I do not know whether on this reorganization the land grant bonds retained their security and in addition received 35% of their holdings in stock; nor do I know whether the first mortgage bond holders of the D. M. & M. received new bonds of the consolidated company, and a considerable bonus in preferred stock. Our books give no information in regard to any such transaction.

Where we put in a new structure, the amount charged additions and betterments does not show the expenditure for time of general officers, the engineer, the accountant, the supervision, the cost of transporting material, or things of that character. In case an engineer went and laid out the ground his time actually put on there would be distributed to that cost but general supervision and general officers would not be.

The amount of replacements in 1913 was considerably in excess of other years including 1912; that is one of the reasons that contributes to making the operating expenditures for maintenance of way and structures items, larger in 1913 than in 1912. There were more replacements and more additions and betterments in 1913 than 1912; there is apparently a little increase in 1912 over 1911. The Negaunee depot was built in 1911 and the Marquette car shops in 1912. Both that station and the car shops were exceptional structures.

In compiling information for annual reports we endeavored to state the real facts; it is reasonably accurate, and the variation, if any is simply an error or oversight; there are also some clerical errors which correct themselves from an inspection of the *of the*

480 report. We use and rely upon those reports as accurate for the purpose of our business.

I believe the operating ratio in Wisconsin for 1913 was above 100%;

DELF.

Recross:

(Witness produced statement of expenditures for additions and betterments, 1900 to 1912 marked Defts.' Ex. 46, Delf, and introduced in evidence.)

The expenditures on account of road shown are the net expenditures charged to additions and betterments for road.

The totals in Defts.' Ex. 46, Delf, should check with the totals of the printed annual report to the stockholders.

Duluth, South Shore & Atlantic Railway Co.

Train Mileage on Republic Branch, Fiscal Years Ended June 30th, 1910, 1911, 1912 & 1913.

	1910.	1911.	1912.	1913.	Total.
D. S. S. & A. Pass. trains.....	51	34	68	85	238
C. M. & St. P. " "	2,199	2,191	2,191	2,191	8,772
D. S. S. & A. Freight "	1,220	1,866	1,608	1,916	6,610
" Ore "	7,963	6,047	2,926	4,862	21,798
" (Special, Circus)...	....	....	34	....	34
	11,432	10,138	6,827	9,054	37,452

The C. M. & St. P. mileage stated, is that of the passenger trains Milwaukee Jct. to Marquette. This mileage is not included in the revenue passenger train mileage, shown in my exhibits. The small amount of D. S. S. & A. passenger train mileage, is excursions or similar trains.

Between July 1, 1911 and June 30, 1912, fourteen 80 pound split switches replaced twelve 60 pound split switches, and one 70
481 pound split switch, replaced one 72 pound split switch. Between July 1, 1912, and June 30, 1913, one 80 pound switch replaced one 60 pound split switch.

Between July 1, 1911 and June 30, 1913, 74 old style cattle guards were replaced with new steel cattle guards and 18 new steel cattle guards were put in that were not replacements. The total 92 were all charged to operating expenses.

The entire cost of replacing switches was charged to operating expenses; the 80 pound switches, split, cost $40.80, the 60 pound $32.87; and the 70 pound $34.39. This did not include labor.

The entire cost of the new reenforcing stringers on bridges was charged to operating expenses; that is so in all cases where the stringers were put on the bridges to strengthen; I do not know as that is true where the bridges were rebuilt.

DELF.

Redirect:

(Complt.'s Ex. 84, Delf, shows the mileage of certain locomotives, which ran in both freight and passenger services, by months for the year ended June 30, 1913, together with the percent of each in each service for the year.)

Complt.'s Ex. 83, Delf, shows the mileage of each engine for each of the years 1910 to 1913 inclusive, and the percent it ran in each service.

The term "other" under "kind of service" on Complt.'s Ex. 84, Delf, is yard switching or work service, and does not include road switching.

DELF.

Recross:

The locomotives treated on Complt.'s Ex. 84, Delf, are only those which make less than 95% of their mileage in the service to which principally devoted. In making this table the road switching goes into the freight mileage. It is added as switching mileage.

482 In distributing our coal it is.

The switching mileage other than the yard switching, appears as freight mileage in making the distribution of fuel. (Note: Nothing appears in switching mileage for the first hour's work at any station, and nothing appears if the locomotive worked less than an hour at any station.) On Complt.'s Ex. 67, Delf, the freight locomotive mileage does not include road switching mileage; in distributing coal the road switching mileage on p. 4, Complt.'s Ex. 67, Delf, is used to distribute coal to the freight service in Complt.'s Ex. 83, Delf. In locomotive repairs the road switching mileage goes in, to make an assignment to freight.

DELF.

Direct:

The amount of stores and supplies as shown by the annual inventory was 1910 $264,256.74; 1911, $246,908.23; 1912, $340,057.74, 1913, $362,503.16. Those figures are corrected somewhat from figures I furnished Mr. Riggs. We have eliminated some rail loaned to other parties. These figures are as of June 30, each year.

(Witness produces statement showing statistics for Mackinaw Trans. Co. as follows:)

Statement of Earnings and Expenses of Mackinac Transportation Co. and Payments Made by D., S. S. & A. Ry. Account Boat Replacement.

Mack. Trans. Co. Accts. for	June 1, 1909, to Apr. 30, 1910.	May 1, 1910, to Apr. 30, 1911.	May 1, 1911, to May 31, 1912.	June 1, 1912, to Apr. 30, 1913.
In D., S. S. & A. Accts. for	1910.	1911.	1912.	1913.
Mack. Trans. Co. Gross Earnings:				
Passenger	$38,278.77	$43,506.69	$45,711.76	$44,060.50
Mail & Express	3,378.52	3,304.25	3,472.77	3,710.18
Freight & Miscl.	2,039.78	2,852.87	4,942.03	3,171.89
Total earnings	$43,697.07	$49,664.41	$54,126.58	$50,942.57
Operating Exps. & Taxes	$102,443.89	$96,323.17	$102,175.45	$107,920.62
Earnings in excess of *earnings*	$58,746.82	$46,658.76	$48,048.87	$56,987.05
D. S. S. & A. proportion of net expenses	$16,380.28	$9.332.17	$11,899.08	$18,210.80
Payments made by D. S. S. & A. Ry. Co. toward Boat replacement fund	$10,833.33	$10,000.00	$10,833.33	$10,833.33
Special payments made by D. S. S. & A. Ry. Co. on new boats	.....	.....	$7,297.87	$40,078.13
Total paid by D. S. S. & A. Ry. Co.	$27,213.61	$19,832.17	$30,020.28	$69,222.26

The special payments by South Shore on new boats in years ending May 31, 1912, and April 30, 1913, were in addition to the regular monthly contribution to the boat replacement funds, accumulated since June 1, 1906. The Mackinaw Trans. Co. in 1888 purchased the steamer St. Ignace which was retired from service March 1913. They purchased the steamer Ste. Marie in 1893, she was in service until June 1912. Since June 1906, the three owning companies had each contributed $10,000 a year to furnish a fund for the purchase
484 of new boats. The Wawatan, put in service Oct. 1911, cost $389,853; the boat replacement fund which had been accumulated, was applied in payment; it was necessary for the owning companies to make additional payments and in the fiscal year 1912 $7,297.87 was paid by the South Shore on the Wawatan. Previous to 1910 the South Shore had paid into the boat replacement fund $30,000. The balance of the cost of the Wawatan was provided for by bonds for $184,000.

The new steamer, Sainte Marie, was put in service March 1913, and cost $278,660. The South Shore, June 1, 1912 to April 30, 1913, contributed cash on account of that steamer $40,078.13, and an equal amount was contributed by the other companies; the balance of the South Shore and G. R. & I. proportions was obtained on notes.

The number of freight and passenger cars handled by Mackinaw Trans. Co. the passenger cars including baggage, express, diner, sleeper, etc., cars, was:

	Freight cars.	Passenger cars.
1910	46,299	4,919
1911	49,578	5,304
1912	48,456	6,398
1913	46,092	6,045

For number of passengers I have no figures except for year ended June 30, 1911; that would not take in local passengers, paying their way across and not traveling on through tickets. There was: total 67,254 passengers transferred in connection with business interchanged with D. S. S. & A. of which 53,017 or 78.8% were intrastate, and 14,237 or 21.2% were interstate.

DELF.

Recross:

The earnings shown are the totals received by the Mackinaw Trans. Co. for transportation of all passengers across the
485 straits, including local passengers not travelling on through tickets. The operating expenses and taxes shown are those for the entire ferry.

The amount stated as passenger, mail freight and miscellaneous earnings on the statement were used to reduce the operating expenses to get at the net; they were not used to arrive at the division. The net expenses of the Mackinaw Trans. Co. are borne by the three companies in proportion with the earnings of each of the companies on

freight business that is transported across the Straits for them bears to the total of such earnings.

The basis of the division takes into account the revenue for the entire haul on that business which is carried to the ferry by either one of the three railroads, and the South Shore proportion of the net expense is that which is again reduced by charging off some part of that to the Soo Line. The items which are stated opposite the D. S. S. & A. proportion of net expense, is that left after the Soo Line proportion has been taken out. The Soo Line proportion does not enter into the D. S. S. & A. expense at all.

DELF.

Redirect:

The business on Dead River Branch, July 1, 1909, to June 30, 1913, was:

	Loaded freight cars.			Passenger cars in and out (each).
	In.	Out.	Total.	
1910	322	206	528	133
1911	76	213	289	188
1912	31	25	56	105
1913	189	121	310	144
Total	618	565	1,183	570

The loaded freight car mileage would be 2,957; assuming an empty car mile for every loaded car mile; it would be 5,914; the passenger car haul from switch to fair grounds is 1.5 miles and
486 passenger car miles would be 1710.

DELF.

Recross:

The total distance from Marquette depot to fair grounds is 2.8 miles. There is no record kept of locomotive miles on this branch; the mileage made there is included in the switching miles.

If you were about to ballast the mine tracks, it is likely the ballast would come from the mines. The ties for use in the mine tracks would be bought out on the line, and from the point of purchase would move to the mine tracks over the common track; the same thing would be true of the rail; they would be moved from the place of storage or from the place of being taken out of other track to the point of use over the common track, and would involve the use of common cars and common locomotives.

The timber for repairing the ore dock might come from west of Duluth, and use the common track from the State Line to the ore dock, or that timber or some of the material might come in from the Soo, and use the common track Soo to Marquette; all structural material for the mine track that was shipped in would be moved over the common tracks; there has been no account kept of the number of tons

of material for use in repairing or constructing the mine tracks and moving over the common tracks. The material used in a freight spur from the point it came into the line or at which it was on the line, would use the common track in moving to the point of use.

The revenue accruing to Mackinaw Trans. Co. from passengers delivered to it, ticketed from points on South Shore and Mineral Range for fiscal years, being the amount collected for coupons of the Mackinaw Transportation Co., was 1910, $15,392.99; 1911, $15,565.06;
1912, $13,154.97; 1913, $18,658.45. This is 50¢ for each
487 coupon or 25¢ for each half fare. I should think the local passenger business on the ferry would be small in comparison.

(DELF.)

Redirect examination:

I have made statements, Deft.s' Exs. 47 and 48, Delf, for the years 1911 and 1913 of the outside agency expenditures; This shows division between freight and passenger, and inter and intrastate.

The common passenger proportion is divided intra and interstate on the equated passenger mile basis, being in 1911 intra 63.42%, and inter 36.58%; the percentages upon the flat mileage basis, without equation, would be for 1911, intra 60.12%, inter 39.88%. This increases the intra passenger miles 15%; in arriving at the percentage; I think the same reasons apply to an item of this kind as to those having to do with the actual carriage of passengers; these expenses are incurred in securing the passengers and in doing the passenger business. The only common item is the expenses of the Grand Rapids office; the specific reason for adding 15% is that the intrastate passengers produced through the outside agency expenditure get greater service per mile than the interstate passengers. The reason for weighing the intrastate passenger mile is the same in all instances, where it is used; that is that it would cost more.

The real reason why I divide outside agencies on an equated mileage basis was because I applied that basis to the other expenses; I did not give definite consideration to the weigh- of this particular item by itself.

For 1913 the common items of passenger are divided to intrastate, 68.66%, and to interstate, 31.34%, on the equated passenger
mileage; the straight mileage basis would have been intra-
488 state 65.58%, and interstate 34.42%.

DELF.

Direct:

Referring to Defts.' Ex. 47, Delf, the items, common passenger on account of Grand Rapids office, divided between inter and intra on equated passenger mile basis, I think a more equitable division is on the basis of the business from the territory covered by the passengers solicited. The total number of passengers received from G. R. & I., M. C., P. M., D. & M., and G. T. for fiscal year 1913 was

25,583, of whom 23,295 or 91% were intrastate; I believe a proper division of that item would be 91% to intrastate rather than the equated passenger mile basis.

I would not say this was an allocation as the man whose expenses are thus assigned would possibly have nothing to do with those tickets, but he covered the territory in which those tickets were sold, and I think the relation of inter and intra tickets would be fairly measured by the relations of the total business out of the territory covered. The greater proportion of the business we get in this territory we would get without a solicitor; the great majority of the people who buy tickets routed over our line, do not know we have a solicitor in Grand Rapids, he does not deal directly with them, but with the agents of the lines selling those tickets; he makes periodical visits to them and endeavors to have them sell their business over the D. S. S. & A.

There is absolutely no way of telling what business the outside agency soliciting man produces; he does not sell any business and it is only so far as his influence with agents of other lines goes what he is of use to the company.

I believe the more accurate way to divide the common passenger expenses, of the Marquette and Houghton travelling freight
489 and passenger agents, between inter and intra would be on the relation of the inter and intra business represented by tickets sold at South Shore stations in Michigan; of these 1913, 94% were intrastate.

I have taken the number of tickets sold without regard to the length of movement and have included tickets between local points where there is a good deal of business that no other line could get, as well as tickets for interchange business. The travelling ticket agent in Upper Peninsula, I believe visits all stations, and his business is usually with the agent; in many instances with the head of a society arranging for a local excursion, base ball teams, etc.

Complt.'s Ex. 85, Delf, shows for years 1911, 1912 and 1913, ticket sales of various classes on South Shore. This is similar to Complt.'s Ex. 64, McPherson, with minor corrections, and variation as to mileage exchange tickets; the 1911 figures take no account of mileage books, though they were then used.

Assuming that between 1911 and 1913 the number of interstate tickets remained constant, but the intrastate tickets increased 30%, it might, and probably would, have been necessary at the points where the greatest part of the increase occurred, to have increased facilities for selling tickets. I do not know as such facilities were increased between 1911 and 1913; there has been demand right along at the stations for increased help, and in many instances they were made; I do not mean to say that that was altogether due to increase in passenger business. It was an increase in all the business at the station, partly passenger and partly other kinds, and it may have been due to increase in passenger at some point. At the smaller stations I presume the agent can sell 30% more tickets with-
490 out overtaxing him; not knowing the number of tickets sold at each station I could not say at what station he could not

do so; I think some additional help was given the ticket agent at the Marquette station.

There were no changes made at any other stations in the ticket selling forces. The principal number of tickets are sold within half an hour of leaving time. I do not know of any increase in our conductors between 1911 and 1913.

Complt.'s Ex. 86, Delf; a statement showing cost of repairs on each locomotive for each of the years 1910, 1911, 1912 and 1913.

At present there are 196 points on South Shore in Michigan, where freight may originate or be delivered; during fiscal year 1913 there were 200; there are 42 stations on the road in Michigan where there is an agent for the purpose of receiving or delivering freight, doing the billing, collecting charges, and other freight work.

DELF.

Recross:

Our passenger trains do not stop at all those 196 or 200 points; they stop at the 42 agency points and at many stations where there are no agents. There may be a few more passenger ticket agencies. There are *not* sidings at all these 196 or 200 points.

When we discontinue the freight service at a particular station if there is no more business to be had there, the siding would be taken up; in every year some of the points go out and new points come in.

The reason for strengthening our bridges, principally is on account of the increased weight of our motive power—the new
491 engines. I am of the opinion that the bridges east of Soo Junction, and the Carp River bridge, will complete the repairs necessary to carry our new equipment.

On account of each of the replaced bridges, there should have been a charge to operating expenses of an amount equivalent to the cost of reproducing the old structure in kind at the time the new structure was put in.

DELF.

Redirect:

The strengthening timbers on bridges were charged to operating expenses. I believe under a strict interpretation of the additions and betterments account they should be charged to additions and betterments, rather than to operating expenses. The charge was made in the engineering department, and there was a difference of opinion in the interpretation of some of the classifications. That difference of opinion did not arise until after this question came up last week. I believe under the classification the additional strengthening timbers should have been charged to additions and betterments, though it did not bring the structure back to its new condition or value.

Where additional material is put into a bridge to permit it to

carry heavier tonnage, it should be charged to additions and betterments.

Complt.'s Ex. 87 is a statement showing the stational service given at points of origin to less than car load freight originating in Michigan on the D. S. S. & A. Ry. and at destination to less than car load freight delivered to consignees at points in Michigan on the D. S. S. & A. Ry. for the year 1913, separated as between intrastate and interstate.

DELF.

Recross:

Complt.'s Ex. 87 has reference only to service given at point of origin or at point of delivery to consignees on D. S. S. & A.
491*a* It has no reference to service given to a shipment received from or being delivered to another line at a junction point. I have not taken account of the latter service in this statement. The exhibit has no reference to the service through the injunctions, such as at the Soo, St. Ignace, Munising, Shingleton, Ishpeming and Negaunee, and other junction points.

(Defts.' Exhibits 49 and 50, Delf, outside agencies expenses for 1910 and 1912, introduced in evidence. The method of preparation is the same as that applied to the years 1911 and 1913, Defts.' Exhibits 47 and 48, Delf.)

On April 20, 1914.

DELF, recalled.

Further cross-examination.

By Mr. Wykes:

492 As auditor for the South Shore, I make reports for the Soo Union Depot Co. which was organized in 1900 and made its first report to the State Board of Assessors in 1908. The total cost of property to June 30, 1908, is given in the 1908 report, at $114,397.16. That includes real estate, structures, and $500 worth of equipment. The right of way and station grounds cost is stated separately. It is given at $38,431.67, exclusive of buildings. The right of way and station grounds were purchased in 1900 or before, the depot being built in 1900. The cost of the station buildings and fixtures is given at $45,099.23, that was principally the Union Depot. Some appurtenant buildings have been put in since.

The 1913 report shows the cost of property to that date to be $118,634.85; the cost of right of way and station grounds is carried in the latter report at the same figure, $38,431. The report shows that there were no expenditures for real estate or right of way or station ground between July 1, 1907, and June 30, 1913. The total capital stock paid in of the Depot Co. is $75,000. There are no bonds. The assessment of the company is $100,000.

On June 26, 1914.

DELF, recalled.

Further cross-examination.

By Mr. Wykes:

In Ex. 108 in Ore Rate Case (Defts.' Ex. 76 here) I attributed 25.75 miles of the D. S. S. & A. trackage to its exclusive ore business; 8.73 miles of this was treated as main line, and 17.02 miles as branches; the main line is the south or second line Winthrop Junction to Eagle Mills, part of which was formerly used in passenger business; it is not a continuous line, as there is a break in the westerly portion of Negaunee where the Queen mine caved under it; the part that cannot be operated through is a mile and a half or two miles. In Ore Rate Cases I assumed an average maintenance of $500 a mile for exclusive ore trackage covering items of expense under the maintenance of way and structures group. I
493 assumed those expenses covered all that pertained to the ore business; there might be other expenses of those tracks, but we assigned no others to the ore business; we treated those track expenses as the equivalent of $500 a mile. For the entire trackage of the Houghton division I found an actual expenditure for the same items of $913.91 per mile.

Defts.' Ex. 75 and 76, Delf, are Exs. 106 and 108 in the Ore Rate Case respectively.

The D. S. S. & A. receives no part of any sleeping or dining car revenue derived from the sleeping or dining cars of other companies. From the C. & N. W. and C. M. & St. P. we get revenue for permission to them to run their trains over our tracks.

On July 21, 1914.

DELF, recalled.

Further direct examination.

By Mr. Cotton:

Mr. Thompson's division of the item expenses of station employees is not proper. He accepted our allocation between passenger and freight and divided the common expenses for station employees upon the relation that the allocated items bore to each other. It is only possible to make allocation at a few points and at certain points the total expense of station employees was for freight; the amounts allocated to passenger were small. The relation of the passenger and freight business at the stations which are common is not at all the same as it is at the stations where we were able to allocate portions. The time method does not charge enough of the common item to passenger. I believe the revenue train mile basis fairly divided the common expenses and is more nearly correct than the method used by Thompson.

I think the statement of Mr. Thompson, that, considering the equivalent of complainant's entire line in Michigan, there would be a use of such line daily by about 3.6 passenger trains and by about 8.85 freight trains, is incorrect.

494 I have made a computation for each fiscal year, 1910, 1911, 1912 and 1913, and for the aggregate of those years, for both freight and passenger trains. I believe it is correct. It is as follows:

Duluth, South Shore & Atlantic Railway Co.

Fiscal year.					Number of trains per day over equivalent to the entire line in Mich. on which train miles are produced.
1910	Pass.	750,263	÷ 152,931	=	4.905
	Frt.	909,983	÷ 152,931	=	5.945
1911	Pass.	765,460	÷ 152,931	=	5.005
	Frt.	819,900	÷ 152,931	=	5.361
1912	Pass.	733,828	÷ 152,931	=	4.789
	Frt.	801,359	÷ 152,931	=	5.240
1913	Pass.	766,394	÷ 152,931	=	5.011
	Frt.	865,096	÷ 152,931	=	5.657
4 years, 1910-1913	Pass.	3,015,945	÷ 6,111,725	=	4.932
	Frt.	3,395,338	÷ 6,111,725	=	5.550

The mileage of one train each day over track on which passenger mileage produced, for one year of 365 days, would be 152,931 miles. Dividing the freight train miles by that figure would give 5.945 freight trains in 1910, and dividing the passenger train miles by that figure would — 4.905 passenger trains in 1910, that run over the equivalent of the entire line in Michigan, on which train miles produced. The table shows like computations for the other years and for the total of four years, and results. The time ratio 4, of

495 Thompson, I don't think proper, accurate or approximately accurate, to divide unallocable common expenses of maintenance of way and structures where the cost results from weather stress, erosion, decay, etc. My reason is that it does not measure the use of the property by the two classes of service. The time ratio takes the elapsed time of the two classes of trains between terminals and takes into the freight train time 32 per cent of its total time, which is spent at stations doing stational work of various kinds, unloading freight, switching cars and the like and does not measure the use of the remainder of the common property, that is, the property between stations, which is the greater part of the whole; neither does it measure the use of the property at stations, because the greater part of that use at stations is on exclusive freight track. Thompson stated that freight trains travel 16 and passenger 27, miles an hour on the average. The freight train at 16 miles travels 23.47 feet per second, and passenger train, traveling 27, travels 39.6

feet per second. Assuming a bridge of 1000 feet, if 5.55 freight trains passed over in 24 hours, they would travel 5,550 feet on the bridge, consuming 226 seconds, or 3.93 minutes; and if 4.932 passenger trains passed over the bridge in 24 hours, they would travel 4.932 feet over the bridge, consuming 12.5 seconds or 2.1 minutes. A total for the 24 hours of 6.03 minutes out of 1,440 minutes, or .42 per cent of actual time, leaving 99.58 per cent of unoccupied time. The same proposition can be applied to any thousand feet of the track and all the track structure. In my opinion, the weather stress, depreciation and damage thereby, in that 99.58 per cent of time, should not be divided on Thompson's time ratio, but on the ratio shown by my table.

Thompson's time ratio assigns too much operating expense to freight and too little to passenger. To decrease passenger
496 train speed to 16 miles an hour, making it the same as the freight would increase the cost of passenger, but would not put passenger and freight on an equality, owing to the greater time the freight consumes at stations. Even then it would not fairly reflect a proper proportion of those expenses as against the passenger service. Thompson's time basis assigns about 29 per cent to passenger, and my basis would assign about 47 per cent. Before my basis is applied there should be set aside to passenger service any excess of the cost to maintain for passenger above freight service.

I take it that 25 per cent of these weather stress items should first be set aside to the passenger service.

I don't think Thompson's time ratio 4 proper to divide unallocable property between passenger and freight, the reasons being the same I have just given relative to the common items of maintenance expenses due to weather stress. I believe my table, approximately furnishes the ratio on which to divide the common property between passenger and freight, with the proviso that any excess cost of construction for passenger service should first be set aside to passenger business. That answer also applies to unallocatable expenses due to weather stress.

To illustrate, with two trains a day over the entire line, one passenger and one freight, each makes a complete and exclusive use of the entire property, regardless of speed.

DELF.

Cross:

I have attempted to, but have not made, any division of the advertising expenses. I might approximate it by doing some guessing. I don't see how Mr. Heiss could do it and be sure of his work. His guesses may have been a little different from mine. I haven't the result of one month, it was so unsatisfactory, I thought it
497 was useless to go ahead with it. Mr. Heiss took three years. I think, on the division between inter and intrastate, Mr. Heiss' figures are nearer correct than that arrived at by using the revenue train mile basis which we used. He endeavored to allocate

them by assuming that, if the advertising was in a Duluth paper, it was interstate business, and I don't know how he treated advertising in Michigan papers, it might be intra and it might be inter and intra. In most cases the vouchers show the points at which the advertising is done. (It is admitted that Deft.'s Ex. 78, Heiss, "Advertising," are Heiss' allocations and that they represent Mr. Heiss' judgment of true allocations of how they should be assigned and that he would, if produced, testify to them, and to having examined the vouchers for the purpose of making them.) In dividing expenses of station employees on revenue train mile basis, there is no loading of, or addition to, the freight or passenger mileage to represent the time of freight trains in stational work. A considerable number of the passenger trains do not stop at all of the stations. The revenue train miles used in my exhibit to show use are the revenue train miles found in my different exhibits in this case. The results produced by that exhibit bear the ratio to each other that the respective train miles in passenger and freight service bear to each other. This is so, inasmuch as I have divided each one by the same factor. The result of this table and of train occupancy indicated by it is the same percentage as the respective revenue train miles passenger and freight bear to each other. In those train miles is nothing to represent switching, or excess time of freight trains in stational work or the maintenance of exclusive freight trackage. The
498 mileage is not produced on any of those exclusive tracks. The exhibit purporting to show the equivalent number of trains, takes no account whatever of speed; if the speeds of the passenger train had gone up 100%, with the same mileage, the results would have been the same. It would not vary as you increase or decrease the speeds if the mileages remained the same. This table does not represent the actual number of trains you would find on the track if you went out at any moment and counted them; that is indicated by Lindsay's table.

"Q. And if you went out and counted the trains at any particular time due to the fact that the passenger speeds are faster than the freight speeds, you would in fact find a different proportion and a greater proportion for freight than is shown by this table?

A. I believe I do. If we are counting the trains at any moment at different points on the road, the speed would have no effect upon the number of trains at all.

The Master: Wouldn't the fact that the freight trains take so much more time than the passenger, result in your finding more of them on a track at one time than you would of the passenger?

A. That would be uncertain, according to the time of the day, there might be at certain times of the day more passenger trains on the line than freight.

Q. Assume they are spread equally over the line?

A. I don't think you could make a count of that kind and get at any results as to the amount of your entire line which is occupied by your trains.

The Master: We are asking for the fact now, not for results; wouldn't the fact that the freight train moves at slower speed, result

in your ordinarily finding more freight trains on the track
499 than you would passenger trains?

A. I don't know that that would be the case.

(By Mr. Wykes, resuming:)

Q. Let me ask it in another form Mr. Delf: you have 152,931 miles made by a passenger train; you have the same mileage set against the freight train in covering the line once each day for a year. Assuming that the passenger train made its speed twice as fast as the freight train, the freight train would be on the track twice as long, would it not?

A. Yes, it would be between the terminals twice as long.

Q. So to go out and count the trains actually on the track, assuming they spread over the track equally all of the time, the results which you have given wouldn't be the same as the number of trains which would be counted using the track?

Mr. Cotton: I object to that based on false assumptions and as incompetent, irrelevant and immaterial and not proper cross-examination.

A. If your freight train took 24 hours in running from terminal to terminal, and your passenger train took 12 hours running from terminal to terminal, if you took the last—and both started approximately the same time, or the one right after the other, beginning of the day, if you count after the expiration of 12 hours, you wouldn't find any passenger trains on the track.

Q. You would fine one freight?

A. You would find one freight and no passenger. You would find only freights, and yet that passenger train has used that entire track just the same as a freight train.

Q. If you started out in the morning 4.9 passenger trains, and 5.9 freight trains and it took the passenger train 12 hours to make
500 the trip and the freight train 24, at the expiration of 12 hours you wouldn't find any passenger train would you?

A. No.

Q. And you would find 5.9 freight trains?

A. That is true.

Q. So then assuming on your table the passenger trains making 20 miles per hour and the freight trains making 10 miles per hour, to express the number of trains that you would actually find on the track, carrying out this computation and assuming the service spread equally so as to have an equal number of trains on the track all of the time, you would find taking the year 1910, 4.9 passenger trains, and twice 5.9 freight trains would be the ratio of actual occupancy by trains, would you not?

A. No, I think not."

Today is the first time I have testified regarding division of property. I applied the ratio given, in which the results are the same as the revenue train mile basis, but are derived from the number of trains using the equivalent of the entire line. I would first take out

the exclusively used property and to the common apply the same ratio as Mr. Riggs did. This process of separating the property originated with myself. This method of arriving at the ratio originated since Thompson's testimony but the applying of that ratio has been my opinion for a long time. That is, I have been of the opinion that the revenue train mile was about right for the division of the common property, but expressed as I have expressed it today, it came to me since Thompson's testimony. This basis doesn't give any expression to time of freight trains engaged in stational service, as usually and principally that property is allocated to freight.

501 Though there would be some of it that wouldn't be; it would be impossible to separate the stational service and find out what part of it is made on exclusive freight line and what is made on the common line. Whatever greater use there is of the common property in freight switching finds no expression in this percentage. It does not take into account the question of speed at all, and the zone of influence over which the train extends did not enter into my computation of less than one percent. If I use that zone of influence, that less than one per cent, might be extended to two or three per cent. The track is there ready to serve any business that comes along, either passenger or freight and no business can use it except the passenger and freight service of this road.

I believe, in my previous testimony I explained that the excessive cost of maintenance due to the refinements of passenger traffic was an element which would weight the passenger side so as to make the revenue train mileage basis fair. This morning is the only place where I have suggested first taking out the element of so-called excess passenger maintenance; I don't suggest that as to those expenses due to wear. I know a lot of the South Shore ties rot out and there is rail cutting to some extent, though I don't know the extent to which the cost of tie deterioration is due to wear or weather. Deft.s' Ex. 80, Delf, is a statement prepared by Muller in the Western Rate Inquiry comparing the basis of allocation of Operating Expenses to passenger and freight as applied by different accountants in railway rate cases, to each of the 116 primary accounts.

This witness was later called to testify before the court.

502 On October 4, 1912.

MERWIN E. ASIRE, a Witness called by Plaintiff.

Direct examination.

By Mr. Eldredge:

I have lived, and been in real estate business, in Marquette for 31 years, and know value of property there. The 1,100 feet of water front belonging to South Shore, opposite Burt and Ely's Add., described on Complt.'s Ex. 6, Riggs, is worth $10,000.

The 2,200 feet of water front owned by South Shore, inside the Harbor, extends from Washington St. to the north line of Ely lot,

and includes sites of the ore, coal and merchandise docks owned by the company. That property is worth $100 a foot front, or $220,000.

The 800 feet of water front owned by South Shore outside the harbor is worth $25 a foot. The 565 feet fronting on west side of Lake St., Jackson to Mesnard Sts., is worth $20 a foot; the 170 feet frontage, west side Lake St., south of Hampton St., is worth $20 a foot.

The 46 50-foot lots between Mesnard and Hampton Sts., 12 50-foot lots west of Division, at Hampton, and the 12½ 50-foot lots between Jackson and Mesnard Sts., are worth $200 per lot.

The 336 feet frontage on Lake St., Baraga Ave. to Washington St., is worth $75 a foot; the 343 feet frontage on Front St., Baraga Ave. to Washington St., which covers end of South Shore, depot yard, two under and one over crossing, is worth $400 a foot. In that valuation, I have included the property described on Complt.'s Ex. 1, Riggs, as 445 feet frontage on Main St., Front to Third.

The 184 feet frontage on Front, south of Baraga Ave., is worth $200 a foot. The 14,608 square feet on Front to Washington and Main, is worth $40,000.

503 The property described in Complt.'s Ex. 1, Riggs, as 100 feet frontage on Baraga Ave., but which I think should be 200 feet, and that described as 150 feet frontage on Spring St., are worth $12,500, valued together.

The 21 lots, Third to Fifth, are worth $500 a lot, as are the 60 lots in the shop grounds, Fifth to Park Sts. These last two valuations are based on an average from Third to Park, as some of them are not of any value.

The last description, containing 60 lots, is 500 feet by about 1,600 feet; I value this at $30,000, independent of the fact that it is not platted. This figures 60 lots at $500. The 21 lots, Third to Fifth, are not platted. I arrived at their value the same way as that of the 60 lots.

The 34 acre tract, south of Nester Add. west of the shops, is worth $900 an acre, as is the 36 acre tract south of Nester Add.

The land on both sides of right of way of north line,—the one straight up the hill to Negaunee,—from its junction with Dead River railway to city limits, containing 6 plus acres, is worth $200 an acre. The land each side of south line to Negaunee, commencing at Hampton St., and running to the city limits, is worth $250 an acre. The east city limits are about 100 feet further than the section line.

The South Shore runs in Lake St.; from the point where it leaves Lake St., and has its own right of way to city limits (about 1¼ miles), the land is worth $250 an acre.

Frontage on west side of Lake St., from north line of Ely lot to Jackson St. (1,000 feet), is worth $60 a front foot. The frontage on west side of Lake St. from north line of the Ely lot to Baraga Ave. (1,100 feet) is worth $30 a front foot.

504 The property I have valued is owned and in possession of South Shore at present. My values were based on a commercial value at present, or on a value prior to time that railroad was

constructed. There are certain portions of this land that were worth more for residence purposes 30 years ago than today. Those portions are south of Baraga Ave., along the lake shore.

The property immediately south of Baraga Ave. as far as Jackson St., west of that, described as lots, I valued at present value. If the railroad were taken out, the property I valued as of 30 years ago would be worth those prices now, as it is desirable for summer cottages. The other property I have valued commercially, without reference to railroad purposes. The value of the 336 feet frontage on Lake St., Baraga Ave. to Washington, which I put at $75 a front foot, was based on a sale of 20 feet to Robertson, for a blacksmith shop, at about $85 a foot.

The 340 feet frontage on Front St. now occupied by the South Shore passenger station would be good business property if railroad was removed. The lot in Spring St., extended east (about 40 feet frontage on Front St.), is worth $10,000, half way through to Lake St. Take through to Lake St., it would be worth $325 a front foot. In making these valuations, I have given only the naked value of the land.

I now have for sale 1,034 feet owned by Longyear, at north end of our harbor, at same figure ($100 a foot) that I placed on the 2,200 feet frontage on east side of Lake St. The latter is more valuable property; in fact, there is none more valuable in Marquette. I would value the tracks described as 21 lots between Third and Fifth Sts. and 60 lots in the shop grounds respectively at the same figures I have given, irrespective of whether platted or not.

505 ASIRE.

Cross-examination.

By Mr. Wykes:

About 3,000 feet of water front on Marquette harbor, 2,200 feet of which is occupied by South Shore, is available for vessels. The remainder is the Longyear 1,000 feet. No. 4 ore dock shuts out another 2,000 feet between the two properties. I have had Longyear property for sale 5 years at $100 a foot. Its width is from 25 feet to 100 feet, back to M. & S. E. tracks. No Marquette water front has been sold in 10 years.

Mr. Longyear bought the 1,034 feet within 15 years. It is the old Burtine saw mill property, once used for lumber dock. When he bought it, he added to the docks, and it was used for a boat landing. He paid about $100 a foot, and it has been lying idle ever since. He bought it before the M. & S. E. went in there. He already owned adjoining land; Lake St. was there then. There was about a block and a half between his residence and water front.

I haven't had a chance to sell the 1,000 feet in last 5 years. There is no immediate demand; I don't know that there would be any more demand if additional 2,200 feet were on the market.

I included the land the tracks are on and all from Lake St. to water in $100 value. The Munising Railway tracks are west of

South Shore tracks. The only thing I base the value on is that Longyear holds his at $100 and South Shore tract is a little better situated.

The descriptions I valued as of 30 years ago are the piece from north line of Ely lot to Jackson St., another from the north line of Ely lot to Baraga Ave., and another from Jackson to Mesnard Sts.

I am 57 years old; 30 years ago, I was selling peanuts on a train,
and made no sales of property. Marquette, 31 years ago, had
506 4,500 people; today it has 12,000. The land there was within
corporate limits 30 years ago. The streets were about the same as today; 30 years ago, Ridge St. and those south of city were principal residence streets. Then, there was a summer hotel and several cottages about 300 feet north of north line of Ely lot, on Water St.

The description, 1,100 feet water front, opposite Burt & Ely's Add., valued at $10,000, is not presently available for water front use, and has no value as water front property.

Description, water front, outside harbor south of south line of Ely lot, 850 feet, valued at $25 per foot, is immediately south of 2,200 feet; there is on it a building, formerly a roundhouse, and a shanty. Part of shore line here is rugged, rocky and high, and part is quite narrow between water line and tracks, and in water near the shore are one or more large rocks 20 feet across; this 800 feet is outside the protected water front. The 2,200 feet would all fall south of a line drawn at right angles to end of breakwater. The 850 feet and Standard Oil Dock south of it gets some protection from the breakwater; only a northeaster affects them, and they don't get the full force then.

The Spear buildings are on the 2,200 feet. The 850 feet is not devoted to any present use as water front; my value of $25 a foot takes the upland back to the South Shore track, but does not include it. The track is from 50 to 150 feet from the water; there have been no sales of water front property comparable with this.

Description, frontage west side of Lake St., south of Hampton, 170 feet, value $20 a foot; it is 125 feet deep. There is a switch on it, no buildings.

In Lake St. are two railroad tracks, taking half the street; Hamp-
ton St. is 60 feet wide, with cheap cottages on south side, some-
507 what aged, there for 20 years. On Lake Street, south, is a
little better class of houses; can sell 50 foot lots, better located in Marquette, for $1,000 at present; my value of this description was as of 30 years ago.

Description, 46 50-foot lots, Mesnard to Hampton Sts., I valued at $200, present value; they lie immediately west of previous description; valued at $20 a front foot, with a street, and maybe several lots between. 30 years ago, the water frontage was worth considerable money; I don't think these $200 lots were worth that much 30 years ago.

I don't see how I could put a present value on that land now occupied by the railroad; I could only do it by assuming the railroad was away.

I have recently sold lots on corner Jackson and Adams Sts., on Blemhuber Ave. and on Hampton St. Description, 343 feet on Front St., Baraga to Washington, valued at $400 per front foot, average; this is of varying depths. I don't remember the figures I made in arriving at the $400 a foot; I took everything from Front to Third Sts., except the underground cut on west side of Front St. I did not value frontage on Main St., Front to Third, separately, but included it in Front St. frontage. The most valuable part of Marquette is Front St., Baraga to Washington, and Washington, to Third; values on Washington and Front are about the same.

The only vacant property on Washington St. belongs to Wm. O'Meara. I know of no property between Baraga and Third which has changed hands recently. About ten years ago, vacant property on south side of Washington, midway between Front and Third, sold for $150 per foot; I know of no other sales within 15 years, except one, about 12 years ago, on Washington St.

A citizens' committee (in Dec., 1911, and Jan., Feb. and Mar., 1912) made up a roll of all property in the city, and placed
508 values upon it, for the purpose of use in equalization before the Board of Supervisors; the purpose was to find the actual value of the property of the city. The committee was Wm. O'Meara, John Robertson and Arthur Palmer, and was appointed by the Council, of which I was a member. The purpose of the committee report was to permit city to go before the Board of Supervisors and show that the city was assessed at fair cash value; the reported figures were changed somewhat by the Board of Review, which cut it from $10,000,000 plus to $9,000,000 plus, and became the assessment roll, making this roll $2,500,000 higher than the previous one.

The purpose of the committee and Board of Review was to get Marquette on the tax roll at fair cash value; I think it is now under valued; when finished, before review, I think it was nearer cash value. I think this report was fair, and gave approximate cash values of property valued, as far as I know; previously, the city was assessed at 50% to 60% of cash value, parts being on at nearly cash value and balance being low. The idea of the committee was to get whole city on fair cash valuation. After increase in valuation, Marquette was 15% of the valuation of entire county; it was 25% before.

I know of no sales close to the 34 and 36 acre descriptions within 5 years; I have been selling platted acreage for four years just outside city limits, a mile further west, north of brewery.

I have sold 300 lots, four to the acre, at $100 per acre; two or three have been built on. I have no acreage, and know of no sales, near those two descriptions (valued at $900 per acre). I have lots for sale in Nester Add. The railroad property is across the street from some of the lots. The land is platted south of the east end of 34 and 36 acre tracts, with a few scattering houses.

The 12 lots, 50 feet wide, west of Division, at Hampton, are rough, about 25 feet higher than surrounding, and are worth con-
509 siderable less than average of $200.

ASIRE.

Redirect examination.

By Mr. Eldredge:

Dead River branch leaves main line and crosses West End Add. Between that and Park Cemetery is Nester's Add., which is well built up.

On the property east of cemetery and north of Washington are few vacant lots; Washington St. Park is immediately south of Park Cemetery, as are four blocks, well built up, of Nester's Add.

Homestead Add., not shown on Complt.'s Ex. 9, Riggs, lies just south of South Shore property and Nester's Add., and west of H. A. Burt's Add.

Fisher and Rock Sts. extended would run into Homestead Add., where lots, 5.5 to the acre, sold at $200.

I purposely avoided examining tentative roll by committee. In saying that that roll arrived at approximately fair cash value, I judged from the totals and my confidence in the men making the roll; the equalization value of the Board of Review, at $9,000,000, has no necessary connection with the property's true value.

The cheap houses on Hampton St. lots cost from $600 to $1,000.

In stating that I had no other method of arriving at value of 2,200 feet water front than Longyear price, I did not accurately express my meaning; I could put a value on it if I did not know Longyear's holding price. I was influenced by the price he paid, and by the fact that 2,200 feet was more valuable. Without sales, I maye be able to say that property has considerable value, taking into consideration
510 fitness for mercantile purposes; it had the deepest water on the harbor, is located next to business center of the city, and is protected by the breakwater.

If the docks and property of South Shore were taken away, this barbor front is still useful for many purposes; I base my values on all these considerations. There is an immediate demand for this property; when I stated there was no immediate demand, I meant I did not know of any purchaser who wanted it at present.

Description, frontage west side of Lake St. north line of Ely lot to Jackson St., valued at $60, lies east of Champion St.; value of lots on easterly side (1 to 16 of Champion Add., 50 x 100 feet) of Champion St., without improvements, is $600 or $700 each; I know of sales at that price. Value of these lots is diminished by railroad; if railroad were not there, the 1,000 foot could be platted, and lots would be of equal or greater value than those in Champion Add.

Description, 1,100 foot frontage on west side of Lake St., north line of Ely lot to Baraga Ave.; the north end could be used for business, and south end for residence, purposes; the property is not as deep as the 1,000 foot strip.

Q. In reality, then, you haven't put a value on this property of what it was 30 years ago, but you have put a value on it of what, in your judgment, it would be worth today for other than railroad purposes, if the railroad was removed therefrom?

A. Yes, sir.

Q. And that applies to all of the property with reference to which you said that you had valued it on a value of 30 years ago?

A. Yes, sir.

Longyear purchased the 1,000 feet plus all water front be-
511 fore the location of L. S. & I.; the South Shore was then opposite about two-thirds of it.

I have averaged selling 40 lots a year in Marquette for five years, and in two years have built over 120 houses.

ASIRE.

Recross-examination.

By Mr. Wykes:

I would have put the same value on 343 feet of Front St. frontage, had I known it included undercrossing towards Washington St.—approach to No. 4 dock.

On Nester's Add., at least 50% of the lots are built on. The lands I platted and sold near brewery were on N. E. ¼ of N. E. ¼, N. W. ¼ of N. E. ¼ and S. E. ¼ of Sec. 16—a mile from center of city, and one-half mile from settled portion of the city. Champion St. lots are on a very high bluff; the railroad yards are at the bottom of the bluff, towards the lake and railroad tracks, a block away.

Q. Now, yesterday you made your value on three items here, that Mr. Eldredge has just interrogated you about, as being very positive that the valuations were fixed as of 30 years ago, and this morning you change that, and make the valuations as of today; which one of those do you want to stand?

A. I didn't know that I said valuation of 30 years ago. I intended to say that the property was worth more 30 years ago for residence and commercial value than it is today.

Q. Mr. Eldredge's questions and my questions and your answers all indicated that you were fixing values as of 30 years ago?

A. I didn't intend that. What I intended was to say that that property was, for residence and commercial value, worth more
512 30 years ago than it is today in its present condition.

I testified in the Barassa, Martel and Marketti case in Negaunee. I think I put values of $100 an acre there through the swamp lands; I am sure I did not exceed $200. It is about 1.5 miles this side of Negaunee.

ASIRE.

Redirect examination.

By Mr. Eldredge:

I am not as familiar with land values in Negaunee as in Marquette; in Negaunee, my value was with reference to farming purposes, and proximity to Negaunee, and on no other principle.

On January 8, 1914.

ASIRE recalled.

Further direct examination.

By Mr. Eldredge:

Valuing the right of way, from mile post 150.56 to mile post 151.92 (Complt.'s Ex. 1*b*, Riggs, and 1*c*, Riggs). I attach no more value from Chocolay station to the present Lakewood station, .11 miles, than to the sand plains, east of there. From the Lakewood station to the city limits, 1.35 miles, valued at an average of $200 per acre. If that right of way was not used by railroad, it would be used for summer cottage lots. That average value is based on lots I have sold in Lakewood and Riverside Additions. I put a value below the value of the lots. The lots sold at $100 per lot, averaging three to the acre. I sold about 40 such lots, within 6 years. I still own five or six lots, for sale, in Lakewood, and 25 or 30 in Riverside.

Valuing the track rights described under items 4 and 25, in Lake St., I value it, from the point where Lake St. is entered to Hampton St., at an average of 5¢ a square foot, 73,200 square feet, or
513 $3,660. From Hampton St. to the north line Ely lot, 42,000 square feet, at 20¢, equals $8,400; north line of Ely lot to Baraga Ave., 11,820 square feet, at 30¢, equals $3,546; Baraga Ave. to Washington St., 9,180 square feet, at 75¢, equals $6,885. Washington St. east, 22,660 square feet, at 20¢, equals $4,532. Total value for the tract equals $27,023. I took frontage values on the west side of Lake St. at a square foot price, and applied it to this. Those rights could be presently sold, at the price I have put on them, to the M. M. & S. E. Ry., in my judgment.

Mr. Wykes: I wish to object to the inclusion of any value due to the rights in the street, because those are franchise rights that only have a value that is given to them by the earning power of the roads and not by reason of any location or any use of the ground, because the ground belonged to the public.

Item 5 (Complt.'s Exs. 1*b* and 1*c*), Marquette County, is, in my judgment, worth $5,000. I put twice that value on it. The storm of last November convinces me the water front has very little value there. Items 5 and 6, are worth $20 per front foot on Lake St. I assume that the railroad is taken off this property, and fix its value for uses to which it could be put, basing my values upon what I believe the value of adjacent or nearby similar property. All my values, except where I give another reason, are based the same way. The lots in items 7 and 8 are valued at $200 each.

The right of way from east line of Adams St. to east line of Catholic cemetery is $200 per acre, and there to city limits $25 per acre. From cemetery to the city limits, there have been no sales. In my judgment, it is worth $25 per acre; I previously valued this at $200 an acre.

Item 10, I valued at $800—four lots at $200.

Item 11, I value at $20 per foot front on Lake St.

In my judgment, item 12 is $200 per lot, and item 13 is $30 a foot front on Lake St., the entire distance. The chief value of this
514 tract is in about two-thirds of it, under the bluff, level with Lake St. The other third, in on the bluff back of the Champion St. lots, would have little value. (Stipulated that 1.50 acres lying west of red line across item 13 is not in railroad use.) The total value of item 13 is $60,000. The deduction for part not in railroad use is $5,000.

The value of item 14 is $25 per foot front on Lake St.; the hard land is worth $20 per front foot, without water rights. I add five dollars for water rights. I value land across Lake St. at $60.

Item 15, I value at $100 a foot front on Front St. My previous testimony was an average of $400 per front foot for all the property on both sides of Front St. If I previously valued item 15 separately at $200 a front foot, I was in error.

The value of parcel 16 is $30 per foot front on Lake St. It is not so deep as property farther south.

Parcels 17 and 18 I value at $10,000. My former valuation was a little high. Since I testified last, I purchased a tract on Baraga Ave., across the street from this frontage on Baragar, at $40 a front foot. In my former valuation, I took into account abutting damages. My present value is without reference to damages to other property in any way.

Cadarette testified: The parcel which Riggs, in Compit.'s Ex. 1, and Hansel, in Defts.' Ex. 15, described as 336 feet frontage on Lake St., measures 346 feet. In Ex. 1*b*, the frontage on west side of Lake St., south of No. 5 ore dock, was given as 26 feet. It measures 46 feet. I had page 12 of Ex. 1*c* copied, and rearranged the allocations of item 19, to fully account for the 316 feet thereof, and left item 19 as originally prepared by Riggs, so that now there are two 19's covering the same property.

515 The value of items 19 and 20 (Complt.'s Ex. 1*b* and 1*c*) is $75 per front foot on Lake St.

(Plaintiff concedes that strip of land 40 feet wide, from Front to Lake St., which on the lake is a part of this 346 feet, is not in railroad use. Riggs and Hansel gave the frontage on Front St., Baraga Ave. to Washington St., as 343 feet. It measures 354.2 feet. In item 24, Complt.'s Ex. 1*b* and 1*c*, the actual distances of separate frontages on both sides of Front St. are correctly set forth.)

Valuing the 2,200 feet of water front described in items 21, 22, 22*a* and 23, beginning at the south line of the water front and extending north 745 feet to the north line of Ely lot, the value would be $55 a front foot on Lake St., and the balance $125 per foot. Within those areas, each foot would be of the value placed on it by me. The land throughout the extent of this property has value independent of the water front; this 745 feet, $30 for land and $25 for water; the balance, $85 for land and $40 for water. The land

that I value at $30 per foot is by comparison with land on the west side of Lake St. The land that I have valued at $85 is valued at more than the land on the west side of Lake St., because it has a greater depth and is available for the same uses—for warehouse purposes. It could also be used in connection with docks.

The land east of Lake St. within this 2,200 feet, would have a value if there were no water rights; my price on the west side of Lake St. per square foot, would be higher than on the east side. I added $10 a foot for the extra depth. In valuing this land on the east side, I have considered rental values; the other element was the value of the property across the street. No comparison can be made in the values of this property and that north and east on
516 account of the depth of the water and that no available shore land goes with the property to the north and east. Of the next, 1,800 feet beyond this, only a small portion has deep water in front, and the next 1,100 feet has little solid ground; it is all water. The last parcel is probably from 20 to 30 feet, between Lake St. and the water. The first part, the half adjoining onto the railroad land, I estimate about 30 feet of land; the remainder is probably 75 to 100 feet of made land.

In item 24, the frontage on both sides of Front St. occupied by the No. 4 ore dock approach would be $250 a front foot, and the frontage on the east side of Front St., occupied by No. 5 ore dock approach, would be $200 a front foot.

Item 26 is worth $250 per foot front on Front St., about 120 feet deep. In all instances where I value on Front and Lake Sts., and plaintiff owns all the way through, I give half the depth to each street.

In valuing items 27 and 28, I would figure Jackson cut to be used for street purposes, and $200 per foot on Front St., with a depth of 124 feet, the remainder to be fronted on Main St., at an average of $200 per front foot—total, $120,740. In my judgment, that represents the fair market value of that property at present if devoted to other than railroad uses.

Mr. Wykes: I wish to object to the method of valuing the back half of the last description, because it assumes conditions which do not now exist. The problem is to determine the value of this property by the values of the adjacent property; but the value as placed by this witness assumes a new set of conditions, the opening of a new street, and the figuring of a value on the back end of this with reference to putting it in the same condition as the main street of the town, and does not value it by its comparison with the adjacent property, which is the property nearer to Third Street.

517 In my judgment, item 29, included with that portion of item 24 on the west side of Front St., is of the value of $40,000. I would change the depth of the property fronting on the west side of Front St., in Item 24, to make that 100 feet in depth, and use that remaining 27 feet in conjunction with the 14,000 square feet. I would not change the value of the 38.7 feet, $250 per front foot. It is worth just as much for 100 feet deep. I would

increase the square feet in item 29 by 27 times 38.7, and value 15,653 square feet at $30,325—a little less than $2 per square feet. I would utilize that property in enlarging the stores on the south side of Washington St., which are all shallow—near Front St., about 60 feet deep, and at Third St., about 80 feet.

(Subject to objection as hearsay and secondary.) In order to arrive at values, since testifying the last time, I have talked with tenants, and asked them what additional rent they would pay providing they had a rear entrance to their store, or the store increased in length, and have verified my statement upon the rentals they said they would pay. There isn't any question that that property could be sold for the price named.

Item 30, including the site of the new freight house, is worth $50 per front foot on Main St. extended about 500 feet front. If the railroad were removed, I would extend Main St. west from Third to Fourth. I think that would leave all this description on the north side of Main St., except a triangle next to Third.

Mr. Wykes: Before he answers, let that be subject to the same objection that I made to his other extension of Main street in front of the station property, made yesterday.

On an average depth of 100 feet, it would have the same value on Main St. Main St. would be 60 feet wide—the original
518 width.

I base my price per foot on sales of property this last year on south side of Washington St., Third to Fourth. Mr. Goldberg paid $1,250 for a 25 foot lot, and Anton Manthei sold a 50 foot lot for $2,500, both vacant. I put the same value on this property as on Washington St.

In my previous testimony, my value of $500 a lot was an average value, all the way through, as residence lots, including the shop property. I didn't at that time intend to place $500 a lot on that particular property. It was treating it as a whole from Third St. to and including the shop. The prices now put on would not be as residence property. The extension of Main St. would make it desirable for business purposes, the same as Washington St. If the railroad were removed, the property could not be utilized to bring about a substantially similar value as by extending Main St. with a frontage on Third St.

Mr. Wykes: I object to it as not being based on the proper conception of value, or of a method of fixing value. The property at present is affected with the condition, the railroad there, the kind of property that would be in a railroad yard, and it cannot be valued as an entirely different kind of property, with the railroad away, not fronting on Third street.

You would have two frontages, one on Third and one on Fourth, with great depth—500 feet. I don't think any property adjoining the railroad, Third to Fourth Sts., north of the track, is depreciated by proximity to the railroad. All lots on Washington St. abut the railroad and this property.

I value item 31 in the same way, by the extension of Main St., at $25 a foot front on Main St. projected 60 feet wide. These lots would come on the north side of that street, and very little would be taken out of the railroad property. If I testified before as to the separate parcels, and made all $500 a lot, I was mistaken, and
519 wish to correct it. I base my value of $25 a foot front on Main St. extended on a diminishing value from the center of town and on the prices asked for property in the same block on Washington St. I don't think there have been any sales in that block, but this value represents my judgment and what owners are asking. For the first corner, they are asking $50, and toward the west end of the block on Washington one lot is now offered at $25, but there have been no sales.

Parcel 32, I value at $250 a lot, or $1,500 per acre—lots about 50 by 125. I previously valued this property at $500 a lot, as I averaged the property from Third St. west.

Of item 33, except 1.38 acres, the lots fronting on Washington St. are the most valuable. The 4.09 acres is probably $1,500 per acre, on an average. The average of the whole thing is $650 an acre to Lincoln Ave. and $200 per acre from there west. The property on Seymour Ave. is one-half the value of Washington St. property. The second block on Washington St., in the Nester Add., is about one-half the value of the first. (Subject to scale of map, it is agreed that Ex. 1 should have stated 72.46 acres, instead of 70.46.)

The right of way of the Dead River Railroad, north Marquette, items 36 and 37, is worth $200 per acre. I put the same value on lands occupied by the mill tracks, North Marquette.

I have been in the real estate business in Marquette 26 years. I have been personally interested in eight different additions, and during that time have bought and sold property in all parts of the city, not less than 800 parcels altogether; also three additions at Chocolay.

520 ASIRE.

Cross-examination.

By Mr. Wykes:

I put Lakewood Add., at Chocolay, on the market four or five years ago—one row of lots from 240 feet to 700 feet in depth, with frontage on a bayou or Lake Superior. The lots run back to a 60 foot street parallel to the railroad. There are 17 or 18 houses on that plat. Every lot has a water front, either bayou or Lake Superior. I still have three or four lots for sale at $100 to $150 a lot; $100 was the original price. Where I placed a value of $200 an acre starts in the the center of Lakewood, and that is only 13 lots until we run out of Lakewood, and then the right of way is so close to the river or the bayous that it would have the same value as Lakewood or Riverside.

Riverside, on the market about four years, is on the river—51 lots, about one-half sold. The country adjacent to those additions is flat—nothing but pure lake sand. In buying a plat, and selling

lots, we figure the retail price will be four times what we pay for the property. That covers the cost of platting and selling, carries the investment, and leaves a profit. That is, in buying suburban property. On any addition, there is, incident to platting and putting it on the market, the waiting for sales, energy used in making sales, taxes, and things of that kind; so we must buy it in block much cheaper than we get for the individual lots. I sold those lots one-fourth down and $10 a month, with 7%. The 7,100 feet that I valued runs to the city limits. Lakewood is on the north side and Riverside on the south. The railroad divides them.

In order to utilize the right of way through this 7,100 feet at the prices I have named, it must be united with the land on the sides. That is true of all these narrow strips I valued. I assume they would be united with the adjacent lands, with the exception of these parcels in Marquette that are blocks. I don't apply of necessity,
521 that to blocks or lots in Marquette. I based my prices on description 3 on the Lakewood prices. There are no lots adjacent to this strip until you get just where they enter Lake St., and then there are lots across the street.

In getting my price of frontage for items 4 and 25, I took prices on the west side of Lake St. I figured, to obtain the 5¢ per square foot applied to 3,660 feet, the average prices of lots in Burt and Ely Add., which ranged from $200 to $400. I figured the square foot area, and divided it into the prices. I didn't use any particular lot. I know what the asking price is and what lots have been sold for in Burt and Ely's Add., and on that I base my judgment. The lots are about 125 feet deep. A number of lots extend up the hill, so I think, in figuring, I took 100 feet in depth. I think they are nearly all 50 foot frontage. I cannot tell where the lots were that sold for $400, nor where they sold for $200, nor what the proportions were. There have been few sales in that addition in late years. I have had, for two years, 10 or 12 lots then listed for sale at from $200 to $300.

That plat has been on the market 25 years; 60% to 75% of the lots remain unsold. There were no sales, to my knowledge, in the last year. I don't think I have made any in four or five years. A brewing company sold a lot there; I couldn't say when.

Marquette has grown in the last five years, but all to the north. Any growth to the south has been limited to filling in a few houses in territory already occupied by houses. On Burt and Ely's Add., there have been no buildings built in the last five years. The last census shows 12,500 for Marquette, and the last previous census 10,050. Probably 30 new houses have been built during the last year. There are a great many lots around Marquette not yet sold. There are a number of plats lying to the north of what is shown on Ex. 6*a*. I have about 200 to 300 vacant lots listed with me
522 for sale. I had exclusive sale of those listed with me.

I got the price of the track rights, upon which I placed 20¢ a foot, from the abutting property on the west side of Lake St., south of Hampton, and the first parcel north of Hampton. I based it on one sale, which is the only sale I know of on Lake St. That is in

the Edwards Add., on the property marked on the map, "Addn." with a "1" above it.

The entire 208 feet was sold. I used 175 feet depth, in figuring my square foot basis; the same of the property south of Hampton. I arbitrarily fixed the proportion of the price attributed to the front part of the lot. I did not reduce it to figures. I attributed $20 a foot to the Lake St. frontage sold. In fixing my 30¢ price for track rights, I had no sale, but fixed that with reference to my own values. The same is true of my 75¢ price. I did not fix that with reference to sales. There was a sale in that district of a blacksmith shop to Mr. Robertson, seven or eight years ago, for $85 a front foot.

The first building along Lake St. from Baraga Ave. north is a second-class hotel, on the corner of Baraga and Lake; the next is a dwelling; then an unoccupied store building; then a warehouse; then a dwelling house; then the blacksmith shop; and then the property of the South Shore, which is vacant until you come to the little office building. Those are just ordinary dwellings, renting at from $10 to $15 a month. My price of 20¢ from Washington St. east was not based on sales; it is my judgment. I do not know the nature of the rights of the South shore in Lake St.

"Petition of the Bay de Noquet & M. R. R. Co. praying that they may be permitted to lay a R. R. track on Lake Street south to the Carp River and N. & E. to Light House Point, was presented. On motion Mr. S. P. Ely, Agent of the Bay de N. & M. R. R. Co. was allowed the privilege of setting forth the advantages of the privileges asked in said petition. On motion the prayer of the said petition was granted as amended by the Council as follows, to-wit: Right and privilege is granted to the Bay de N. & M. R. R. Co. to lay a railway track on the East, or water side of Lake Street, and to use or occupy said R. R. track, (reserving to the Village for general road bed 30 ft. from the sidewalk, on the West and South side of
523 said street), together with turnouts and crossings as may be necessary for the convenient use of the same, by proprietors of manufacturing establishments, or the general public along the whole length of said street within the Village limits, from Light House Point to Carp River.

I hereby certify that the foregoing is a true copy of certain proceedings of the Common Council of the Village of Marquette at a meeting held June 14, 1869, as found in the "Record of Village Proceedings" of said Village, Liber A, page 59.

Witness my hand and official seal at the City of Marquette, Michigan, this 31st day of December, 1913.

[SEAL.] DANIEL S. DONOVAN,
City Clerk, City of Marquette, Michigan."

"At a special meeting of the Common Council held June 23d, 1869, petition of J. W. Edwards & others residents and property holders on Lake Street praying that a reserve of ten feet may be made on the West side of Lake Street for sidewalk purposes, was presented. On motion the prayer of said petition was granted.

On motion the Street Committee was instructed to have the Old Jackson Cut filled up where it passes under Front Street, the full width of the street, at as little cost to the Village as possible.

On motion it was ordered that the Grant made June 14th, 1869, to the Bay de N. & M. R. R. Co. relative to right of way on Lake Street be so amended as to reserve ten feet on the West side of said street for sidewalk purposes, and that the said R. R. Co. shall leave 30 feet clear of the sidewalk on the East for general road bed.

Sept. 4, 1869. On motion the Street Committee were instructed to investigate the matter of building a bridge on Front Street across the old Jackson Cut, with plans for the same and estimates of cost and report the same at the next meeting.

I hereby certify that the foregoing is a true copy of certain proceedings of the Common Council of the Village of Marquette as found in the "Record of Village Proceedings" of said Village, Liber A, on pages 62, 63, 64 and 78, respectively.

Witness my hand and official seal at the City of Marquette, Michigan, this 31st day of December, 1913.

[SEAL.] DANIEL S. DONOVAN,
City Clerk, City of Marquette, Michigan,"

524 My valuation was based on the assumption that the company had something they could sell or transfer. I came here in 1881. That property was then in possession of the M. H. & O. R. R., and has continued in their possession ever since. I valued this as a railroad right, the value of it to the company for railroad purposes, rather than something that could be sold for commercial purposes. I made no examination of the earnings of the company, or anything of that kind, to see what it would be worth on that basis. I took into consideration and applied prices fixed by sales of the fee adjoining.

I fixed the value of item 5 with reference to adjoining lots and its water front. The price is dependent on my judgment. I didn't do any figuring to arrive at that as regarding lots on Lake St. I think the footage value of adjoining sales could be used.

In valuing item 6, I used the sale, referred to before, by which I fixed the 20¢ price for track rights. This piece is nearly 400 feet south of that. My price assumes the railroad track to be taken entirely out of that territory. If it remained within 100 feet of those lots, they would still have that value. I don't think it would make any difference for residence purposes. The lots would be just as desirable, with a railroad track adjoining the property, for manufacturing, or any business that might want to locate, that required a sidetrack.

We have no land in Marquette on the lake shore west of Lake St. that is level, for manufacturing purposes. The new manufacturing plants have been obliged to go to the north of the city. For residence purposes, the presence of the railroad in the immediate neighborhood takes off some of the value.

I assumed the lots in item 7 would be residence lots. To make

them salable at the price I fixed would require the removal of the railroad. If railroad structures were left immediately adjacent, the land would still have the value I fixed for residence purposes,
525 as the lots are of that value, on the south side of Hampton St.

The value I placed on item 10 assumed the removal of the railroad and the return of the description to the adjoining parcels or lots, which are held by different individuals. There would be a good deal of work involved in getting rid of those and arranging transfers, as each adjoining lot is held separately. As it lies there in the shape it is, I cannot conceive of any value it has except for railroad purposes. I did not take these difficulties into consideration in fixing the values; I do not think I ought to. I think they are worth the prices I have fixed on them.

I assumed the lots in item 12 would be used for residence lots, which would involve the removal of the railroad, but would not involve its removal from item 11. The class of people that will live in that district will not always be affected by the railroad. They will not always locate elsewhere if they can get land at the same price. Men working for the railroad company prefer to be close to their work.

I had no sales to assist me in fixing the value on item 13. I graduate that value down from my prices in the center of town. The next sales to that tract that I had was the Robertson blacksmith shop on Lake St. on the north and the Edwards property on the south. Item 13 is the only piece of ground level with Lake St. that could be used for manufacturing purposes west of Lake St. The Edwards piece is in the second block south from this property, and the Robertson piece about 3 blocks north. In order to make item 13 available for manufacturing, you would have to assume a railroad remaining on Lake St.

I got my price on item 16 in the same way. It is more valuable, being closer to the center of town, but not as deep.

526 In valuing items 17 and 18, my price was induced by a sale, right across from it, on Baraga Ave., 30 feet out of lot 17 or 18 on block 2 of C. I. & M. Add. The buildings on the south side of Baraga Ave., facing on the railroad, are store buildings, except a livery stable. Those next to Front St. are poor; after you pass the livery stable, they are a better class of buildings—fire proof buildings after you pass lot 20 of block 2. I put a value of $12,500 on these two pieces, before taking into consideration the severance damage. I still considered these parcels would have some value by reason of the facility with which they could be added to the adjoining property, and we have taken an average frontage, reducing the actual frontage. I took both parcels to average a piece of 200 feet frontage by 100 feet in depth.

I put $2,000 on the Spring St. corner of Spring and Third, and $8,000 on the Baraga Ave. The first building west from item 17 is a fireproof store, used for meat market and harness shop. The buildings west of that are wooden dwellings, moderate structures, some unpainted. In figuring this irregular tract, I only take into account

so many feet frontage on Third St. and so many on Spring. I would not take more than half the frontage on Third. There would have to be some work done on that track to get it into shape in connection with other lots, which work would have to precede its being sold to advantage. I value it as it is now.

I got my figure on item 19 from the Robertson sale, the only one made on Lake St. I don't think there is any other property for sale on Lake St. Those old houses on Lake St., toward the south end of that block, would not bring a rental to pay a return on that value. There have been no new structures in that block on Lake St. within 10 years. What I have just said in regard to item 19 applies to item 20.

527 On the 2,200 feet of water front, on items 21 and 22, I added $10 a foot land value to the value on the west side of Lake St., and the value of the water frontage is my judgment, scaling it from the center of this tract south. The water front at the center would be worth more than further south. There are two other sales I know of on the west side of Lake St. One is on the corner of Main and Lake, to the L. S. & I., 110 feet on Lake and 140 on Main, with a structure on it, for $7,500; the other is on the corner of Washington and Lake Sts., to the L. S. & I., 278 feet on Lake by 105 on Washington, with a two-story structure, now used for the depot and general offices, for $50,000.

I valued item 24 as half way to Lake St. on the east side. In my estimate of $40,000 from Front St. to Third, I estimated this at 100 feet depth fronting on Front St., which would be of the same value as 124 feet, in my judgment, on parcel 29. The depth of the stores on Washington St. is 94 feet at the corner of Third, and narrows down, on the curve, to about 55 feet at Front—74½ feet average depth. About 200 feet east of Third St. would be 90 feet in depth.

In uniting the Jackson cut to item 27, and using item 28 as a street, I did not take into account that there was something like 10,000 yards of excavation in that cut. It wouldn't cost anything to fill the cut, if we were to use the property in the way suggested. The excavating of the basements for the store buildings fronting on Front and Main, together with other basements that would be excavated in a radius of six to eight blocks, would fill the Jackson cut. I can't answer how many years it would take to fill it in that way. It would not be necessary to construct that street, to build on Front St., and the excavating for your buildings on Front would fill in a considerable distance back on Main St. I assume a sale of this property at these prices in a reasonable time. The problem, as I stated it, assumes the sale of the parcels, the digging of cellars and putting in of structures, in the near future.

528 I recall two new buildings in the business section on Washington St. in the last five years. There are no vacant lots on Front St. The one on the south side of Washington St. opposite the Mining Journal was built about three years ago, by Fred Donckers, and the other one, on the north side, this last year. I only recall two other new business buildings within a quarter of a mile of the South Shore station in the last 5 years, on Washington St., between

Third and Fourth, south side. Within a radius of half a mile, there have been two grocery stores in the residence section erected on Third St., north from Washington. The building constructed by Marquette National Bank was finished two years ago. The station site would make 21 lots and 10 feet on Main St., and the frontage of about 140 feet on Front St. The stores in town vary from 18 to 25 feet wide.

In the industries of Marquette, outside the railroad, we have a sawmill, employing probably 50 men; stone quarry, 25; Mining Journal Printing Co., 25; Lake Shore Engine works, about 150; Longyear & Hodge, 20; and the two rock crushing concerns, 75, in the summer. There are quite a number of things that employ labor. It would take some little time to think of all of them. There is our life saving station; and the boiler works, 12 to 15 men. I assumed the property two blocks west of the station, and the frontage on Front St., Baraga Ave. and Spring St., would also be used for business. There are no vacant lots on Front St., in the business section, except the property owned by the South Shore.

There have been sales in the residence portion. There was a price of $3,000 for 50 feet between Bluff and Ridge Sts., on the east side—the side opposite the library,—about 150 feet up the hill.

529 In valuing items 27 and 28, I averaged the entire distance from Front to Third at $200 per foot. The value would diminish as you went west on Main St. to Third, with the exception of the corner. I did not locate my values. I just made an estimate, from the value of Washington St. property, that the property on Main St., handled this way, would be worth as much as the property on Washington St.

The two principal business streets of the town are Front and Washington. The last sale on Washington was next to the Opera House—$9,000 for 48 feet, or $187.50 a foot. I would value the lot on the south side of Washington St., next to the corner of Third, at $135 a front foot, which is the valuation I would place on the corresponding lot on Main, if that change were made. The $9,000 lot occupied by me is 150 feet deep, but only 110 feet is used. That was the last vacant lot in that block on Washington St. On Washington St. immediately west of that block, and directly north of item 30, are the postoffice and the city hall. The lot sales directly north of item 30 on Washington are across from the city hall, west about 150 feet. That is where a new building is going up. I apply the Washington St. prices to the property on new Main St.

When I get farther out in the country, on description 33, I give the Washington St. frontage a value of more than twice the value of the property just off of Washington St. That property is so far from the business portion of town that it would not be used for business, and is not nearly as well located for residences as the Washington St. property.

In the prices I have fixed for that part of the property available for business, if the railroad were moved, I did not assume all those parcels would be sold at the same time. I think there are eight build-

ings on Front St., Washington to Baraga, occupied as saloons,
530 and three on Washington St., in the first block off Front. There are no vacant stores on Front St. today. The property next to the livery stable, once used for a moving picture gallery, has been out of use a few months. I asked tenants on Washington St. how much additional rent they would pay to have a rear entrance to their stores, or the buildings extended. Delf said he would be willing to pay $5 a month, simply for the rear entrance, and the moving picture man said he would be willing to pay a considerable addition if he could have his building extended. No one else named the amount of money they would pay. I interviewed none of the owners.

In valuing items 30 and 31, I figured 500 feet at $50 from Third to Fourth, and 526 feet at $25 from Fourth to Fifth, and the triangle, about 50 feet on Third St., at $50—total $41,550, as compared with previous value of $10,500. If the railroad was taken out in order that the other parties could handle their land, they would have to have the street just the same as this land; so I made no allowance for street. It is my understanding that 20 feet of the proposed street would be on railroad property. I assume that the adjoining owners would join in putting a street through, without cost, and give the other 20 feet. The 40 feet between Third and Fourth St. all comes out of the railroad company. Before you get to Fourth St., you must run out of railroad land, if you continue Main St., and the land that abuts that on the south will be equally benefited with the railroad lands, while the street all came out of the railroad land. After you pass Fourth St., 20 feet must come out of adjoining property, and 20 feet out of the railroad company. I do not care to change my value on 30 or 31.

I do not remember of ever saying that it was necessary to give the entire width of description 29 to the lots fronting on Washington St. Some of it would be applied to property that fronts now on Main St., and the property at the west end of this cut would have
531 a rear end, which they need. It might not be necessary to increase the length of those stores, because the stores at the west end of Washington St. are much deeper than at the east end. In my estimate of the value of parcel 29, I contemplate adding some portion of it to lots that now front on Main St. For the purpose of the building fronting on Main St., the land would not have a value of $2.50 a square foot. That was my average figure. It would have to be scaled. To determine a fair valuation, I have applied to that strip Washington St. prices, as indicated by the value of the lot under the building I am now in, in conjunction with the rentals that would be increased, to determine a fair valuation of it. The property used by the building I am in is $2 a square foot, for 100 feet. If we took into consideration the entire 150 foot lot, it would be less.

In order to get the price I put on item 32, it would not be necessary to acquire the narrow lots on the north on Washington St.; $1,500 per acre is only $250 per lot, and that could be subdivided by putting in streets, and sell at that figure. To plat it to advantage, it would be better to run the streets through it, so as to make Sixth and Seventh

Avenues continuous. That would involve purchasing some of the short lots. You could enter it from Fifth St., and plat cross streets that would conform with these streets, which could be opened later on. You would then have an opportunity of getting out to the east and south. You would want to plat it, so as to give lots at least 120 feet in depth; which way it would plat to the best advantage, I could not tell without figuring. A street running east and west, lengthwise of the property, would be necessary, and two cross streets, 66 feet wide.

In fixing my values, I have first assumed the taking of the property out of railroad use. Where I found a strip of right of way not big enough to plat, I treated it as going to the adjacent property, and fixed my value on that basis. In putting a value on item 30,
532 I assume that items 27 and 31 have also passed out of railroad use and go to commercial purposes. I also assume demand for this property. There would not be a demand for that entire property immediately. It is impossible for me to say how many new business places could be utilized at the present time, but I do know there is a demand for more business places in Marquette. We had an application within a month for a retail and wholesale candy factory; we haven't any property for them. This concern wants a store where they can retail candy. It would not be a good location for it on Washington St., across from the postoffice, because the bulk of our better stores are located nearer Washington and Front.

Assuming the reconstruction of the railroad yard, the property on Front St. would be used first, and, as soon as that was occupied, the property on Main St. ought to be as desirable as Washington. The business center at the present time is the corner of Washington and Front The most valuable is from Main St., on Front, to Washington, and then west on Washington to the center of the block. If 600 lots throughout this area of location of railroad property had to be sold in a stated length of time, it would depreciate the value. I don't know about five years; I would not want to fix a period less than five years.

The buildings immediately surrounding the railroad structures west of Third St. are not as good a type as you would find in other parts of Marquette, not affected by the railroad. The railroad affects the buildings and the character of the adjacent structures somewhat. Conditions in that respect in Marquette are no better or worse than in any city of its size.

There has been no marked increase in land values in Marquette since I testified before. There is a general upward tendency in real estate prices, but it is slow in Marquette. There are always some lots on the market cheaper than others. Until those are gotten rid
533 of, the prices cannot go up much. The increase in values is to the north part of the city. In the part of the city along the railroad, it has remained about the same for the past 10 years. Lots and property closer in have come a little closer to a market than a year ago, due to increase in population. The lots I purchased two months ago on Baraga Ave., for $40 a front foot, sold four or five years ago for $50 a foot. The adjacent structures were then about the same.

I base my value on items 34, 35 and 36 on a lot valuation. I diminish my prices from the Nester Add. out. I intended to go to the city limits with my values; at the extreme west end, value is probably $100 an acre.

In my valuations, I have intended to fix the fair market value. If I had 10 acres of land that I could sell for $1,000 an acre in bulk, or could subdivide it and sell it for $2,000 in parcels, I would say the fair market value of the land was $1,000. If you owned 40 acres of land in Marquette, and wrote us what we considered a fair market value, we would fix that value at what we would sell the property for intact. The station ground and adjacent cut would be by the front foot or lot, because that is not a piece to be platted; it is altogether different from 40 acres outside. The value I fixed on the station ground is what it could be sold for in bulk. I would contemplate selling it in three or four parcels.

ASIRE.

Redirect examination.

By Mr. Eldredge:

I would expect to obtain from those three parcels the aggregate which I put on it, and I put on the lots west of Fifth St. what I consider a fair market value. My price there, on that acreage, is what I figure it is worth in bulk. I think it would retail for much more.

534 My price on the right of way from Lakewood station to the city limits and from the city limits to Lake St. was taking that property in connection with the adjoining property. My idea of the price is what it would bring in bulk to be added to the adjoining property.

In the building I occupy, on lot on Washington St. which sold, vacant, for $9,000, there was a large amount of sand at the rear end—from 16 to 18 feet above Washington St., that sloped gradually toward the front about half the distance of the lot. That sand, I thought, affected the value of the lot by $1,000.

The price on item 31 was not based on a bulk sale, but a price it would bring after it had been arranged. The grading, curbing and macadamizing of the street averages about $1.25 a lineal foot. I think a person buying this property would take that into account when buying, and pay the price named. If Main St. were widened in the way I propose, Front to Third, but not beyond Third, my idea of the value of the property, Third to Front, would be the same. If Main St. were extended, Third to Fourth, and not from Front to Third, it would unfavorably affect the value, Third to Fourth and west.

There were 15 acres of the tract on Washington St. originally bought by Hill, Cochrane and Miller, just this side of the Brewery land. West End Add. joins it on the east, but the property they purchased is not platted. They paid $7,500, 15 years ago; $200 an acre is a fair valuation of it. The price I fixed on the property from Fifth St. to the west line of section 23 was a wholesale price, and I would expect the lots to bring considerable higher.

535 ASIRE.

Recross-examination.

By Mr. Wykes:

These lots ought to retail at from $2,500 to $3,000 an acre, or $500 a lot. Lots on Washington St. and Bluff St. sell at that price. There are no lots on Bluff St. less than that, until we get west of this line. Lots on Washington have sold for $800 and $1,000 opposite the shop grounds. I don't remember any as low as $500. I do not think there is a lot on Washington St. east of Park Ave. that can be bought for less than $800. There are a few vacant lots there.

I got the $250 a front foot on the Front St. end of the station property by the value of property on Front and on Washington. The lot on the corner of Front and Main would sell for $250 a front foot. I would expect a less value as you went south. The business center of our town is from Main St. north to Washington, and west on Washington to the center of the block, and I scaled it in that way. The only sales I have are those made recently on Washington St. of a single lot, and not a large tract. I do not know of anything in Marquette of similar character to item 27 that has ever been sold in the shape in which I propose to cut it into three pieces. I did not fix my price with reference to its being divided into three pieces rather than into lots, because I did not have in mind the three or four pieces, but I did have in mind the sale to a party that might take the entire Front St. frontage. I can't name any possible purchaser. I made an estimated value of the land on Front and Washington Sts. adjoining this property, based on rentals, and not from sales; there has been only one lot sale.

536 ASIRE.

Redirect examination.

By Mr. Eldredge:

The growth of the town has recently been toward the north, but rentals on Front St. have increased from Baraga Ave. north. Business concerns aim to get as near Front and Washington as they can. Business has not started up the hill, north of Washington, to any extent. Some of the best stores in town are not south of Main St. Rose's has been improved within three or four months; two new fronts have been put in near there. The railroad track crossing Front St. at Baraga Ave. has a great deal to do with preventing the growth of the town to the south. Before the road was built, Baraga Ave. was the main business street. It is the widest thoroughfare we have, and a fine St., yet, property is not worth as much on Baraga as 30 years ago. I attribute that to the railroad crossing Front St. there.

On July 21, 1914.

ASIRE recalled.

Further direct examination.

By Mr. Eldredge:

I am the Asire who testified in this case previously. I know the plat of East Lakewood. When I valued 7,100 feet right of way of South Shore from Riverside station to mile post 151.92, I did not take into consideration value of land in East Lakewood plat. East Lakewood plat lies east of Lakewood plat, regarding which I testified and of which I was the owner. In fixing value on 7,100 feet, I used lots starting at center of Lakewood and Riverside, taking 13 lots in Lakewood and 15 in Riverside. My prices were all based on comparisons of lots west of center of Lakewood and Riverside Additions and west of lot 13 in Lakewood. The areas of lots in Riverside with which I compared were .78 of an acre and Lakewood 1.10 acres per lot.

537 When I fixed value of South Shore right of way at $200 per acre, I didn't have those lot areas correctly in mind. I stated they would run three lots to acre. Having in mind correct acreage, the valuation should have been $70 per acre, and I would change my value to $70 per acre, to city limits. From city limits west, to Lake street, my values heretofore given stand.

Referring to item 33, (Complt.'s Ex. 1*b* and 1*c*, Riggs, Marquette County, 72.46 acres, extension to shop grounds, I first valued this as 70 acres at $900 per acre. I wish to correct my testimony. I am now at a loss to account how I made some of the answers I did in my second examination. I haven't changed my opinion of a valuation of $900 on the whole tract; dividing the property into three tracts, the first, Park Avenue to Seymour, 25 or 26 acres, I value at $1,500 per acre, average; from Seymour to Lincoln, $650 per acre; and west of Lincoln, $200 per acre. In the first tract, of the 15 acres I was asked to value, I would place part at $2,500 per acre.

The two pieces on Complt.'s Ex. 6*a*, of 4.09 and 3.56 acres, I would value at $2,500 per acre, average; the 7.15 acres between extension of Seymour avenue and shop limits at $1,300 per acre; from Seymour to Lincoln avenue, $650; and west of Lincoln, $250 per acre. The 1.38 acre tract, in track to Sinclair quarry, I value at $200 per acre.

ASIRE.

Recross-examination.

By Mr. Wykes:

The 1.38 acres, quarry tract, is an irregular strip with 50 feet greatest width, extending through lands of others. I wouldn't attempt to put a value on a small piece. I took that as a whole. I wouldn't know how, and it would be difficult, to place a value on a

narrow, irregular piece like that. It wouldn't be worth as much as the same amount of land in a block.

538 As I remember, the second time I testified I placed the land, Park Ave. to Seymour, at $1,500; Seymour to Lincoln, $650. It is the north 7.5 acres, between Park and Seymour, on which I fix $2,500 per acre.

When I get below that, to the 7.15 acres, I called that $1,300. Dividing the Washington frontage into lots, they would range $600 and $700 per lot. The seven acres would have to be cut by a street east and west, and you would get a less price for the lots on that street than on Washington. I fixed those lots at about $300 to $500.

539 On October 5, 1912.

JOHN ROBERTSON, a Witness called by Plaintiff.

Direct examination.

By Mr. Eldredge:

I lived in Marquette 20 years, was once mayor. I have dealt considerably in real estate there, and am familiar with values. I know 1,100 feet of water front of South Shore, opposite Burt & Ely's Add.: in my judgment, its value is $12 a front foot. I know water front property, 2,200 feet, inside harbor, Washington St. to south line of Ely lot; in my judgment, it is worth $125 a front foot on the water. I know 850 feet of water front just south of the 1,100 feet; in my judgment its value is $30 a foot. I know frontage west side of Lake St., north line of Ely lot to Jackson St. 1,000 feet; in my judgment its value is $60 a front foot on Lake St. The 1,100 feet west side of Lake St., north line of Ely lot to Baraga Ave., is worth $30 a foot on Lake St.

Property on West side of Lake St., Jackson to Mesnard Sts., 565 feet, is worth $20 a front foot on Lake St.; frontage on west side of Lake St., 170 feet, south of Hampton, is worth $15 a foot; 46 and 50 foot lots, between Mesnard and Hampton Sts. average in value $200 a lot, some are worth more and some less; 12½ fifty foot lots, Jackson to Mesnard, and 12 fifty foot lots west of Division, at Hampton, would average the same—$200 per lot.

The 336 foot frontage on Lake St., between Baraga Ave. and Washington St., is worth $80 per foot; 16 or 17 years ago, I purchased 17 feet frontage on Lake St. by 65.5 feet deep, next

540 south of South Shore property, facing the Lake, at $1,400; it is worth as much now as then, and the 336 foot strip is of equal value.

The 343 foot frontage on Front St., Baraga Ave. to Washington St., except 14,608 square feet back of stores, I value at $150,000; 184 foot frontage Front St., south of Baraga, I value at $175 a foot on Front St.

The 445 foot frontage on Main St., Front to Third Sts., was included in my $150,000. The 14,608 square feet on Front St., from

Third to Washington and Main, is the back end of Washington St. lots in the cut; it is worth $2.50 per square foot.

The 100 feet on Baraga, and triangle on northeast corner of Third and Spring Sts., are worth $15,000; in fixing that value, I took into consideration the damage to the lots crossed. The property between Third and Fifth Sts., east of the shop, I put at $500 a lot of 50 by 150 feet, and between Fifth and Park Sts.—the shop grounds—at the same.

The value of the 34 and 36 acre tracts, south of Nester's Add. and west of the shops, is worth $900 per acre; the 151.35 acres at north Marquette is worth $32,000, and the Dead River Branch, to north Marquette, is worth $200 per acre, as is the land on both sides of the line.

The south line,—old M. & W.,—Hampton St. to city limits, is worth $140 an acre.

I own 22 pieces of improved and 10 pieces unimproved land in Marquette; I was member of committee appointed by the
541 Council to Make valuation of lands in Marquette.

ROBERTSON.

Cross-examination.

By Mr. Wykes:

I have had six or eight real estate transfers a year in Marquette, in last fifteen years: I had no transfers on Lake St., other than 17 feet mentioned, and none on Front, Washington, Main or Third Sts., in business section. On Baraga, 200 feet west from Front, directly opposite the triangular piece, and between lots 17 and 19, I bought six years ago, giving $1,500 for 30 feet 105 feet deep, and I now own it. The triangular piece, across the street, valued at $50, is of considerably less average depth; I did not consider that; I considered the depreciation—that the damage would be about equal to the value of the entire piece; I considered the property more valuable on that side.

I have had no sales or deals in property near Ely lot; I have had on Champion St., on the first table land—not in hollow with Ely lot. There, Champion is a pretty good street, with a good class of houses, and new ones going in; the price was on White's Add. on west side of Champion St.

The Citizens' Committee, on which I served, began valuation work in November, 1911, and completed March 1, 1912; we estimated a little under the real actual value, keeping 10% to 20% under; that was all the variation we intentionally made.

Q. Did your report read like this; that is, the part of the
542 report that accompanied the roll: "To the Honorable Mayor and Common Council of the City of Marquette: Gentlemen, The Committee appointed by your honorable body to place a cash value on all taxable real estate in the city, wish to report that they have completed their work and the roll has been opened for inspection to the tax payers of the city according to your order, and we wish

to report that we have inspected all the property and placed a fair cash value on same to the best of our knowledge, With this report we turn over the tax roll which we have made. Yours truly, A. H. Palmer, William O'Meara, John Robertson, Committee." Is that it?

A. I presume it is; I don't just recall it now, I think it would answer all right.

The above was read from a printed copy of council proceedings, marked official, and introduced as Defts.' Ex. 3, Robertson, Oct. 3, 1912.

I don't remember that the Longyear description of 1,031 plus feet was valued by our committee at $22 a foot; I don't remember that the Bessie Leggett piece—1900 feet—was valued at $50 a foot. Grace Furnace is immediately north of the 2,200 feet of South Shore property; I don't remember that our committee put $17 a foot on it. If I were to get the value of the 2,200 feet in my own way, I would put $500 a foot on part of it.

543 Q. And yet the property right next to it, your committee in fixing values that you say are 20% lower than cash values, that that is the only variation, fixed a value on the next property to it of $17 a foot; can you explain that discrepancy:

A. Why yes, I can explain it this way: It is the best portion of the harbor that there is, right on this point; as to that, I would put it at five; it has deep water, and it is protected, and there are no floods to bring in sand or sand bars.

Q. They are, both of them, back of the breakwater?

A. Yes, both of them back of the breakwater. This particular spot I have in mind, I would say, would be $500 a lot; it is deep water; never been filled in; there are never no obstructions brought in from storms.

In putting on the 1,100 feet water front in Burt & Ely's Add. a value of $3.30 a foot, the committee was a little lenient, and took into consideration that the railroad was a public utility, for which we had use, and realized at the time we were putting a low value on it.

Q. Did you put a low value on the railroad property at the expense of the other property?

A. Well, our work was subject to the approval of the Board of Supervisors, and if they didn't see fit to approve it, why, as I said before, it was a local affair; we did what we thought we were expected to do, what would be expected of us.

544 Q. Where did you get your instructions to favor the South Shore railroad in your valuation?

A. We didn't get any instructions from anybody.

Q. How did you know you were expected to do that?

A. Well, we know, pretty near long enough, the sentiment of the people of our city; lived there long enough, and acquainted enough with them; acquainted with local affairs, and with politics and political affairs, and otherwise, here—business affairs.

Q. You were going to use this on the Board of Supervisors for the purpose of indicating to them the true value of the city of Marquette,

and in it had values that you now say were way off from cash value; is that the fact?

A. We were going to use nothing on the Board of Supervisors. They were educated, learned, business men, and could judge for themselves. They went over our work; they approved some of it; some of it they didnt.

Q. But you furnished that first to the council as representing your judgment, over your own signature, of the fair cash value of this property, didn't you?

A. Yes, we made a report.

Q. You have answered this morning that the variation was 20%; that is, that it may have run 20% over or under what you would determine was the real value; isn't that the fact?

545 A. We kept on the safe side of any strenuous protest that might came in from the taxpayers, but we couldn't value a piece of property—just determine the exact value of it; couldn't go to a man's house, and go upstairs and downstairs.

Q. So, because the South Shore, you thought, was an advantage to the community, you think on this parcel you put a lower value than you did on some other property; is that the fact?

A. That particular portion down there we did.

Q. Just because it belonged to the South Shore?

A. Not just because it belonged to the South Shore; if it had been any other railroad company than the South Shore, it would have been the same.

Q. Then, if it was a partial exemption extended to a railroad, how does it happen that the next piece, belonging to Caroline Burt, a private individual, is assessed at less per foot, if you simply granted immunity to railroads?

A. I don't recall just what.

Q. Hers is assessed at $3, and this other description at $3.30.

A. What is that description of Caroline Burt?

Q. 198 feet in front of lot 51 of Burt & Ely's Add. Now the Standard Oil—do you know what frontage they have got down there?

A. They have two descriptions; I just forget, now, what it is.

546 Q. They have one description of 180?

A. I believe it is.

Q. And you put a value on that of $13, and that lays this side of the Burt & Ely parcel, does it not, belonging to the South Shore, on which you placed a value of $12?

A. Yes, I think so.

Q. Did you also favor the Standard Oil in the same way that you say you favored the South Shore?

A. I don't know. I don't remember of us particularly favoring the Standard Oil.

Q. That is about right, is it, the amount that you put on the standard Oil?

A. I don't remember; I couldn't recall now.

My lot 30 feet on south side of Baraga, for which I paid $1,500 six year sago, was assessed at $1,200, I think.

In fixing value of property in Marquette, I took into consideration property rented around it, and what it was paying; e. g. north of Spring St. (corner of Front) is a property 44 feet wide, with a poor building, rented at $170 a month.

The values by our committee were given a good deal of consideration; we intended to do faithful and good work, and get 10% and 20% under cash value; the principal exceptions were the railroad property.

The portion of the South Shore water front between Baraga and Main Sts., 700 or 800 feet, is worth $500 a foot on the water
547 front; this was in the strip upon which an average of $125 per foot was placed. I don't remember what value I placed on the remainder; it would probably be 300 feet, Washington to Main Sts. I don't know just what that is worth; I have not gone over it.

Q. About how much?

A. Oh, I wouldn't want to say. I had those figures; put them in separate basis. I would have brought them over; I haven't got those figures.

Q. I don't care to get it down to the last penny; tell me about what you think it is worth?

A. Well, I don't know. Now, I didn't give it very much attention, because I was given to understand that this thing had to be got at an average.

Q. You got it at an average, and tell me how you got your average?

A. Well, I took those valuable portions at a certain figure, and I took the balance at another certain figure.

Q. Isn't it a fact that, taking the 800 feet between Baraga and Main that you say is worth $500 a foot, putting nothing else in at all, the average for the 1,100 feet, taken from the 800 feet alone, would be over twice the figure that you have fixed?

The Master: Do you understand that question?

A. Yes, I understand.

Mr. Eldredge: What 1,100 feet?

Mr. Wykes: I mean 2,200 feet. Let the question go. Did I say over twice? About twice, put it, instead of over. I want
548 it answered—for the entire 2,200 feet.

A. It might be all of it, but there is a portion, I think I said Saturday a portion of it is worth—I don't know just now; I haven't measured it up accurately; there may not be 800 feet.

Q. It was your judgment, when you answered, that it was 750 or 800 feet; that is what you answered, wasn't it?

A. Well, I think I said particularly between Baraga Ave. and Main; that was the valuable front portion. Of course, taking out the footing of the ore docks, there wouldn't be that much; I forgot about that. I didn't give this very much. I didn't suppose I had to give it in detail in this way; I went over it in that way.

The Master: You can tell about the distance from Baraga to Main Street, can't you, approximately?

A. About 600 feet, taking out the dock out of that.

The Master: It would be on the 600 feet you would place a $500 valuation?

A. Yes sir, I would say taking out the dock.

Q. You may take your own way for it, and tell me exactly how you figured out your $125 a front foot?

A. Well, I don't remember, just as I said Saturday, about my other figures, I haven't got them with me; I think I can find them though.

I did not know the Longyear frontage was for sale at $100 per foot; I know, in a way, what he paid for it 10 years ago. I know of no other water front property on Marquette harbor and of no
549 sales, except Longyear parcel, in 15 years, and I know of no one attempting to purchase water front property in 10 years.

My values on upland are fair; I will pay $300 a foot for 25 or 30 feet on Front St.

A 25 foot piece on Front St. would involve cutting into some building.

Defendants' Ex. 4, with dimensions of parcels where they appeared is as follows:

1. A piece of frontage on east side of Front St. at continuation of Spring St. (40 feet wide)	$6,400
2. Overhead crossing on east side of Front St., lying next and north of Fay property	7,000
3. Underground crossing lying next and south of Main St. on east side of Front	8,000
4. Underground crossing on east side of Front St. lying next and south of Marquette County Savings Bank (30 feet wide)	9,000
5. Frontage on west side of Front St. from south side of overhead crossing lying next and north of Schoch & Hallam's store, to the south line of Main St., about 180 feet, at $300 per frontage foot (125 feet deep)	54,000
6. 180 feet frontage on east side of Third St. beginning at
550 the south line of Main, running south, at $135 per ft. (125 feet deep)	24,300
7. 324 feet frontage on south side of Main St. between Front and Third, $125 per frontage ft	40,000
	$149,100

Description, 14,608 square feet on Front St., Third to Washington and Main, $2.50 per foot, is the strip directly back of Washington St. stores. This description goes from Front to Third St., being the approach to the northerly (No. 4) ore dock. The stores fronting on Main St. back to it on one side, and those on Washington on the other. The value of the property consists in its being salable to persons owning stores on Washington and Front Sts., who have valuable frontage, and are hampered for depth; I know it can be sold for the amount I put on it; it is 574 feet, Front to Third.

ROBERTSON.

Redirect examination.

By Mr. Eldredge:

The committee making valuations in Marquette occupied no particular official position. The Common Council and the people of Marquette believed the city was paying more than its fair proportion of county taxes, and the committee's valuation was to show that the Marquette tax roll was the fair value of the property for taxation purposes, together with the fact that we thought there was some property that had been included and was not on. We gave it a thorough going over, with a view to presenting the facts to
551 the Board of Supervisors, so that in equalization Marquette tax might be reduced.

In the beginning, just as you said, we thought we were paying more than our pro-rata of the State and County tax. There were mass meetings in the city, the leading citizens and tax payers of the city held from time to time, and it ultimately resulted in a committee being appointed out among the tax payers, and a committee from the county, to work jointly and recommend something to the city—to the Council. They come in and recommended that there be a committee of three, whose judgment they thought ought to be good, in regard to values in the city, and they appointed the committee that done the work; that is about the way the thing come about.

Q. Now, that committee did not as a matter of fact attempt to arrive at true cash values?

A. No, we never pretended to.

Q. Did I understand you to say that, with reference to industries within the city, like the L. S. & I. R., the Pioneer Iron Company, the Lake Shore Iron Works and the S. S. & A. R. C. you did not even attempt to place their property upon the roll that you prepared at 80% of its true value?

A. No sir, we did not.

Q. In other words, it was the opinion—state whether or not it was the opinion of your committee, that those industries should be favored in taxation?

552 A. Yes sir, and we made that recommendation in making our report so that the Board of Review would know what we had done, and it was subject to their approval, if they thought it was all right.

The Master: Did you state that in connection with the certificate, did you put on your report that you had placed the property at its cash value?

A. I don't know whether it is stated in writing, but I was there when our report was presented to the Council.

The Master: How do you reconcile that with the certificate that you put on your report, that you have placed everything at its true cash value?

A. Well, I don't think our report is the true cash value, it was not the intention, anyway.

Mr. Butler: Was it explained orally?

A. It was explained orally in council meeting, the best of our judgment, and, in putting on those enterprises at a lower value *that* the rest, it was the best of our judgment subject to the approval of the Board of Supervisors.

Q. The exact statement that you made was, that we have inspected all the property, and placed a fair cash value on the same, to the best of our knowledge?

A. That is right.

Q. It was not your intention to value any property, and you didn't value any property, that you knew was used for railroad purposes?

A. No sir, it was not our intention.

553 Where property was vacant and producing no income, we did not in all cases keep our valuation up to 80% of true cash value; to make value takes a buyer and seller. In many places, we did not put what was offered for the property, or near 50% of what was offered, because we considered it unfair and unjust on some property that was non-producing. A geographical glance would tell that the Longyear property was not of the same value as the South Shore water front of 2,200 feet, there cannot be either egress or ingress; a part of it is rocky underneath, a short distance from the shore, and, in fact some part of it is rocky right to the shore; you cannot get to the shore. They would have to cut out South Shore dock No. 4, to get much benefit for dockage purposes. A part of Longyear property, out near the breakage, is valuable for water front purposes. You would have to build a dock out to it. The old lumber dock is the only part I know that is valuable—200 or 300 feet of it. You could only get in at one place—150 feet of it—with a railroad, as the hill is quite abrupt; it is not so easy of access as the South Shore property.

O'Meara lot is the only vacant property on Washington St., Front to Third, average value of frontage of vacant land here is $250 per foot—somewhere along there; it takes a buyer and seller to make a commercial value.

554 ROBERTSON.

Recross-examination.

By Mr. Wykes:

When the committee for valuation of property in Marquette was provided for it was understood that the State Tax Commission was going to put Upper Peninsula values on at cash value.

We were going over our city anyway, and thought we would get it up a little higher; we didn't figure the Tax Commission would put on values too high; we thought we would put it on pretty close to value. The committee was provided for by council resolution and compensation bills presented to council. We did not intend to dis-

criminate between vacant and improved property; we acted among ourselves, as buyer and seller—if a man wanted to sell or buy, or it had to be sold under hammer, what it would bring, and kept a little under that. We figured that would bring it 10% under cash value, or something to that effect; property under the hammer is sometimes sacrificed. Front St. property would not go at much of a sacrifice, if so sold. Forced sale is not my idea of cash value. We fixed our determination that commercial value is created by a buyer and seller; with no purchaser the whole city is worth little. With South Shore tracks east of Front St. moved and its water front thrown on market, I don't know if it would be worth more or less than now; owing to the size of the town, and the ore fields within 15 miles, I think it worth just as much with tracks and South Shore removed; it would be in demand for some purpose as used
555 for today. I know of no demand outside of railroad purposes.

I know of no other use this water front property could be put to, than for ore dock purposes; that is the commodity we have. The question of what it was to be used for didn't come up in fixing my values. We have more ore dockage in use now for other purposes than is needed; I don't know any other use for Longyear property than for ore docks,—I testified that it couldn't be used for that. I put a value on South Shore 2,200 feet water front for ore dock and other purposes; I know of no present use of Marquette water front, save by Standard Oil Company, and those who hold under South Shore railroad Co.

556 On November 8, 1912.

CHARLES F. LOWETH, a witness called by Plaintiff.

Direct examination.

By Mr. Butler:

I am Chief Engineer of the C. M. & St. P. R., and Consulting Engineer for the Chicago, Milwaukee & Puget Sound and the Tacoma Eastern Railways, approximating 9,500 miles. I have been connected with railroad engineering since 20 years old, and engaged in construction work of all kinds at various times in many parts of the country from 1880 to 1901. Since 1901 have been continuously in employ of C. M. & St. P., being Engineer and Superintendent of Bridges and Buildings, 1901 to 1911; since then Chief Engineer.

I have given attention to the cost of reproduction of existing railroads:

(*a*) Since 1903 or 1904, to make the C. M. & St. P. returns to Wisconsin, Minnesota and South Dakota; for those returns I had charge of computation of values of the property in my department, including bridges, buildings, structures, water supply, etc.

(*b*) For last two years, have made an approximation of values of certain of our property in Minnesota, and our terminal property in Milwaukee, Chicago and elsewhere, and at present my department is valuing this company's properties in Illinois and Iowa; this work

has been under way nearly a year and is approaching completion.

I have had much to do with acquiring right of way for C. M. & St. P. and have become familiar with prices paid and their relation to the value of the same and like lands for other purposes.

557 In Michigan Upper Peninsula, the St. Paul has approximately 100 miles of line. We are now building 25 miles, Crystal Falls to Iron River; excluding small spurs, I have had charge of building no other line in Northern Peninsula.

I am able to form an opinion of relation between cost per acre of right of way lands in rural districts, Upper Peninsula, to value of lands through which right of way extends; it ranges from possibly two to five times as much. The average in Michigan, along South Shore, of cost for rural right of way purposes would be not less than three times the value of land for other purposes. In cities and towns such as on South Shore cost of right of way and terminal lands would be from one and one-half to three times higher than market value of same or similar lands for other purposes.

These opinions are based on my experience as a railroad man. On 25 miles being constructed in Michigan the question of mineral rights in our right of way becomes involved; Crystal Falls to Iron River, there is much mining, there being mines in operation and prospective mines, and much land supposed to be underlaid with ore. We have been obliged to take right of way subject to mineral rights; over practically the entire length of branch, we have nothing but surface rights, it being, in many cases, subject to right of owner to compel us to move our track, if necessary, to get at the ore; it is a revocable easement.

558 The line, Crystal Falls to Iron River, is through a territory subject to caving when surface is mined under. We protect ourselves by hauling in earth and maintaining track men there the entire year, to keep the track up; the settlement is gradual and slow, and covers about a quarter of a mile of the track. To my best memory, it has cost $5,000 to $15,000 to keep our track up for several years past, over that quarter mile space.

For South Shore earth work constructed in 1911 or 1912, the cost would, in my opinion, be 30¢, or probably more. On our 25 miles being built in Michigan, this work was divided into two sections, approximately 11 and 12 miles long; on one section, clearing bids ranged from $45 to $80, and on another from $45 to $96, per acre; the contractor securing the work was the lowest aggregate bidder, but highest for these items.

There were 14 bid prices for first section of 11 and 12 miles, with 136,000 yards. Low bid and contract let, $157,875; high bid $218,410.

559

Bid No.	Clearing, per acre.		Grading, per cubic yard.		Grubbing, per square yard.		Rock excavation, per cubic yard.				Aggregate.
							Loose.		Solid.		
	1st Sec.	2nd Sec.	1st Sec.	2nd Sec.	1st Sec.	2nd Sec.	1st Sec.	2nd Sec.	1st Sec.	2nd Sec.	
	(R., p. 2742)		(R., p. 2743)		(R., p. 2744)		(R., pp. 2813–2814)				(R., p. 2816)
1.....	$75.	$75.	$ .35	$ .35	$1.50	$1.50	$ .50	$ .50	$1.00	$1.00	$206,230.
2.....	45.	55.	.26	.32	1.45	1.10	.55	.45	1.50	1.50	191,690.
3.....	80.	96.	.2375	.27	1.00	.90	.40	.38	.77	.72	157,875.
4.....	60.	60.	.295	.295	1.50	1.50	.45	.45	1.00	1.00	180,230.
5.....	50.	50.	.24	.22	1.50	1.50	.45	.50	1.10	1.15	166,000.
6.....	50.	50.	.275	.275	1.25	1.25	.50	.50	1.35	1.35	184,735.
7.....	60.	60.	.31	.31	1.60	1.60	.65	.65	1.50	1.50	218,410.
8.....	52.50	52.50	.297	.297	1.00	1.00	.4775	.4775	.875	.875	178,620.
9.....	45.	45.	.28	.28	1.05	1.05	.65	.65	1.45	1.45	200,000.
10.....	60.	60.	.28	.28	1.25	1.25	.50	.50	1.40	1.40	188,365.
11.....	55.	60.	.30	.28	1.00	.90	.47	.45	.95	.95	175,685.
12.....	60.	60.	.29	.32	1.50	1.50	.40	.45	1.20	1.25	188,265.
13.....	45.	55.	.265	.33	1.25	1.25	.40	.40	1.40	1.45	183,115.
14.....	45.	45.	.31	.33	1.25	1.25	.43	.43	1.25	1.25	188,100.

560 The overhaul was bid for separately on first section, and prices ran from 1¢ to 1.5¢ per yard; the bids were on the basis of the company transporting, over its own line, all men, tools and equipment, free.

To make estimate of cost of reproduction everything done should be included. On work done after contractor is through, I would limit the charge to construction to things of construction delayed to be done after line is completed; certain things can be done more cheaply when road is in operation. My remembrance of the specifications are that the loose rock classification would take the hard pan.

In constructing South Shore all at once, including entire railroad, I would expect the prices to average much higher, as a large amount of work devided between a given number of contractors leads them to believe there is going to be plenty of work in their line, and if they were not successful in getting work at the first letting, they were going to get it at some subsequent letting. On the 25 miles, contractors were anxious to get the work, and I have no doubt they made very low bids; if it were 25 out of 600 miles of line, the different sections would probably command higher prices. If a large amount of work is to be done in a state, the demand for labor will exceed the supply, and labor will have to be brought from a long distance, and it would command a higher price and cost more to look out for the labor and bring it in; all the supplies would also command higher prices. The ten-
561 dency would be to higher prices if the whole 600 miles of track were let at once.

My opinion of the fair cost of track laying on South Shore, if reconstructed, would be $800 a mile. My analysis of cost, from study in Iowa and Illinois, is: Train service, $235.45; track laying machine, $28; camp equipment, $11.50; superintendence, $10.50; machine gang, $22.50; rear gang, $51; front gang, $53; surfacing and lining, $115.50; loading at material yard, $1.29; camp outfit, $10; use of tools, $8; maintenance of track during construction, $98.50; and transportation of laborers, $30; aggregate, $803.

The item of contingencies in the cost of reproduction of a given property, should include those items of cost, whatever their character, that could not be seen in making an inventory of the property or which might be overlooked or by error or oversight omitted from such inventory and by the possible error in the unit cost that might be taken in making the valuation. The contingencies in making an estimate of the cost of a property to be built would cover those things which, due to the haste in which the matter was investigated, had been overlooked or which from the nature of the case could not be foreseen and provided for. I think that there is very little, if any, difference in the allowance for contingencies in the case of making an estimate of reproduction of an existing property and in making an estimate of the cost of property that was proposed to be built, for the reason that as we go over a completed property there are always some elements of cost that are not apparent. It is impossible to carry out any large piece of construction without accidents, accidents of such a

nature that they involve loss of life and property. Those losses enter in as one of the contingent items. In going over a completed
561a property it is impossible to tell whether anything of that kind did happen or not, but from our experience in reconstruction we know that they certainly do happen. When we built our line to the Pacific coast our company spent between $250,000 and $300,000 to make trails and final roads across the Bitter Root mountains. We needed them to get over the country in order to make our surveys and to get out contractors over it and to get the contractors' materials in. There is no evidence of that item of expense today except that the roads are there and belong to the public. It was a contingent item in the cost of that construction. The item of contingencies arising from the necessity of changing the routing of material forwarded to near points from that planned, anything of that sort, almost invariably comes in and sometimes in very large amounts in any large construction. Another instance in the construction of our line to the coast was that we had anticipated taking all of our track and bridge material out over our own line and carrying the completion of the line out from the Missouri River through to Butte, Montana, and we worked on that plan until we got pretty well into the State of Montana, and due to difficulties which were unsurmountable, we had delays in our grading so that it was apparent that we would suffer a very serious delay in the completion of our line through to Butte unless we sent our material around by the N. P. road to Lombard and begun laying the track easterly from Lombard. That involved the paying of revenue freight on material for long distances, that was not a part of our plan. We are doing at the present time a large amount of new construction work involving 200 miles, more or less, of double tracking and new line construction in Iowa and a similar amount in Minnesota and South Dakota. We have been unable to get waterways completed, that is, bridges in and culverts in, so that in many cases the grading contractors have been obliged to leave openings in the embankments for these incompleted waterways or else to pile the material up at each side of the opening so that it could be put in
561b after the opening was in. That will involve either one of two things, the handling of a large amount of material a second time or the leaving of the openings and temporarily bridging them and the handling and filling them later. In many cases we have put in a construction for waterway which was not the most economical, because of the urgency in getting that particular job done. It sometimes involves a change of plans from the original purpose. There are unexpected difficulties that come up and we find that it is necessary to stop and back up and start again and that means the abandonment sometimes of work actually done. The contingencies in new construction of that kind are oftentimes very large and they are more than is usually the case in building construction or in any kind of construction where the work is concentrated, such as it is in a large bridge, where the conditions can be readly seen. The building of a railroad extends over a great many miles of country and sometimes it is difficult of access and the natural conditions are very variable and it is impossible, practically speaking, to anticipate all of the difficulties

and so it is customary to add a considerable percentage for contingencies and after the road is built and an estimate is made of what it would cost to replace it, there are a great many things that legitimately and properly enter into the cost of the road that cannot be discovered. Open cuts are sometimes found where it was originally intended to build a tunnel or perhaps a tunnel was originally built. We had a case of that kind near Rosalia, Washington. A tunnel was built through a spur of the hill, I don't remember how long it was, but six or seven hundred feet, as nearly as I can recollect, and before the line was put on a construction basis we found that the material was yielding, before it was put on an operation basis, and notwithstanding that it was a well timbered tunnel, we had to make an open cut of it. The cost of doing that was considerable, because the time that it took to do it extended past the period at which the line had been
561c opened up for traffic, and that enchanced the cost of doing the work. Another contingent item is that work of this character is subject to floods and fire. We are necessarily obliged to build across valleys and along streams. The time required for construction involves mony months, sometimes two or more seasons and floods occur and the work that is partly done is washed away and it has to be replaced. That cannot be guarded against. It is a contingent item. Our company had notable experience of that kind. We had our line approaching completion and some considerable track was laid between Deer Lodge, Montana and Missoula, right side by side with the Northern Pacific. They were building at the same time and there was an unprecedented flood and the loss to our company from that flood aggregated something in excess of $600,000. It covered a matter of 75 miles or more, and about that same season we had on the other side of the Rock Mountains in the Jefferson River and in the Musselshell River, a number of bridges in which we had put in the piers and the steel work had been delayed and we were carrying our construction trains over on false work and a flood came and so much drift collected in front of the structures that the stream was blocked and our permanent piers and false work was more or less washed out and we had to replace it and in addition to the cost of replacing it was the delay to the work. Another contingent item was where a great many timber structures that were built and subsequently replaced by embankment, the intention was to make the embankments from the outset but there was no material available within reasonable distance by haul by contractors' outfit and it was necessary to put in timber structures to take care of our construction train service, and fill by earth by train haul. The inspection of the completed property after the lapse of some years would not disclose the original expenditures for the trestles. Another contingent item is classification for material. There are many kinds of material which at the time that they are opened up would properly be classified as loose rock or
561d hardpan and yet after the surface is exposed to weather they resemble common earth and in going over a road and looking at the surface or slopes of the cuts one would say confidently that that excavation was made in earth whereas by going into it more thoroughly you would find that it was hard-pan or a considerable portion

of it was hard-pan. Another contingent item is the diversion of highways and private roads and waterways for one reason or another It is necessary oftentimes to divert these, the cost of which involves extra right of way, extra grading, oftentimes the moving of buiidings and structures of various kinds. After the work is completed, especially after the lapse of a few months or years, there is no evidence of the diversion of highways, farm roads, no evidence oftentimes of the diversion of streams. A great many contingent items come in from unanticipated or unforeseen expenditures due to delay in transportation of material or equipment or men. In the buiiding of a railroad there are large amounts of material to be purchased and gotten in hand and it is necessary that they should be gotten in hand in their proper order. Track cannot be laid if we have an abundance of ties and have no rail or if we have the rail and have not got the fastenings. Track cannot be laid unless we have the material in hand for the bridges and the culverts. If the material is not there, then either the track laying is deferred and the force of men and equipment stands idle or an expedient is resorted to which costs in many cases a great deal of money. It is of almost daily occurrence that a contingency arises in which you cannot stop to count the cost. It must be met and overcome no matter what it costs and if the material is not on hand for a bridge the ties will be taken and they will be cribbed up, and the track carried over that way. Then after the track is over and the material does come, why those ties, track, will be taken out and the bridges put in. That is only one of thousands of instances of that kind, all of which add to the cost of the construction. They
561e cannot be avoided, or foreseen. They can be foreseen to this extent that we know that they will come in all large construction and likely to be met with but I say confidently that one who has not been right on the ground and seen and had experience with these conditions, can hardly realize the frequency with which they occur and the pressure that is brought to bear oftentimes to overcome them irrespective of what the cost may be. When we started to build our Puget Sound line, one of the first things that we had to do was to cross the Missouri River and we had to get our material across, not only our material, but all the contractors' supplies. We were in a country where there wasn't anything, you might say, and we had to build a temporary bridge over the Missouri River and our construction account shows that after we credited up as much of that temporary construction to the construction of the permanent bridge as was reasonable and proper, that we spent in excess of $70,000, simply for facility to get a track across the Missouri River, that never would show up in any inventory that might be made of that piece of property today. The building of that bridge involved several contingencies. The river is subject to rather rapid rises. It has a very strong current and we had an unexpected break-up in the spring, and we lost a partly completed caisson. It was swept away from its moorings, taken down stream two or three miles, and the cost of recovering it was more than it was worth and it was abandoned. We had several fatal accidents. The cost of that bridge alone was slightly over $1,000,000, and we had, I think, two or three fatal accidents. In my judgment it would

be conservative to put a contingent item of ten per cent on the entire cost in making an estimate of the fair reproduction cost of the Duluth, South Shore and Atlantic road in the Northern Peninsula of Michigan. While the contingent amount on some items might not be as much as 10 per cent on others it might very readily be much in excess. That would not include 10 per cent on the cost of or-
561*f* ganization and legal expenses and interest during construction and engineering and the like, but upon the physical items, the cost other than the overhead items. In my opinion the 10 per cent would be the average of all items and not the amount of contingencies applicable to each item. I think it is universal in making an estimate for new work, to allow for contingencies, add a percentage that cannot be defined, and it has been our practice to add 10 per cent, and to add 10 per cent after we had taken unit prices that in a measure made some allowance for the same. What is done will depend largely upon the thoroughness with which the estimate is made. The contingencies are variable, and you might build a hundred miles of railroad this year and have certain kind of contingent items and rebuild a piece of line side by side and of identically the same character another year and the contingent items be different. Contingent items depend upon the weather, upon labor conditions, and then again the contingent items, take for a hundred miles of railroad in one state, might be of a certain character and in another state they might be of still a different character. It is the unexpected that is covered by the contingent items. Contingencies would be a greater average on some classes of work than on others. For myself, I have gotten at the average by my experience and my observation. Sometimes the contingencies may not be as much as is estimated. At other times they may be much in excess, and an estimate of a certain percentage for contingencies I think from the very nature of the case, must be an estimate, and cannot be arrived at with any exactness.

I am as confident, as I could be of anything that has not occurred, that in the reconstruction of the South Shore road, we would have casualties, accidents, which would involve injury to persons and property, which would be contingent items such as those I have mentioned, for work of that character, which would extend
561*g* through three or more seasons. It is also quite sure that there would be contingent items in the way of floods. There would be contingent items in respect to classification. I doubt not that there is considerable material, the exact character of which would not be evident on a superficial inspection of the property. I do not see how that extent of railroad could be built without involving diversions in the highways, in farm crossings, and in diversions of streams. Those contingent items would surely occur. There would be contingent items in connection with the construction of the road over or under or across other railroads, electric and steam; due to the crossing of telephone and telegraph wires which would have to be changed; due to the construction in the cities in which paving would be disturbed, water works pipe or sewer or things of that kind. There would be other contingent items, that would be more or less of the general character of those I mentioned. In my judgment there is a reasonable prob-

ability that these or a certain proportion of them will occur in every railroad that is constructed. The percentage would vary according to weather conditions, season of the year and character of the country through which the road was built. The contingent items would be smaller if all conditions were favorable, such as casualties, floods and things of that character. The items of farm crossings, highway crossings, of pavements in cities assume the passing through of a settled territory. If the territory is sparsely settled, the possibility of those items and the amount and percentage for them would be smaller, and for exactly the same reason, other contingent items would be more. There is, as I remember, the country, a large proportion of swamp land and soft land, the surface of which is soft and yielding, and there would be a more than usual contingent item in the increase of earth work on that account. The country traversed by the South Shore railroad is not as accessible for the getting of supplies and men as a similar length of railroad would be in many other sections of the country, and the difficulties of getting
562 labor and holding labor and getting supplies in, would be enhanced over and above what it would be in most any other section of the country, anywhere within a radius of 500 miles, or a thousand miles. Where the work is contract work, the contractor would bear the cost of casualties and they would enter into his price. If he was financially able to carry out his contract, he would bear that burden, but contractors are not always able to do that, and when they fail, the railroad company has a contingent item that often varies considerably. I think the conditions might possible be as favorable or as unfavorable that the contingent items might be as little as 5 per cent and possibly as great as 15 per cent.

In rebuilding South Shore, legal expenses would certainly be incurred. We could not build a considerable piece of railroad without becoming involved with other railroads and corporations; there would be negotiations and contracts to be made with other railroads and corporations, rights to be acquired in cities and towns, ordinances permitting construction, the crossing of streets, etc. There would be demands from one source and another and claims
563 arising. There are highways to be changed, making necessary contracts with municipalities. In our line, Crystal Falls to Iron River, legal expenses are unusually large, because of difficulty of getting right of way involving mineral rights. So far we have assumed, on other overhead items, .5% for legal expenses, and I have not gone into it with enough detail to know whether I care to change that; it is probably conservative.

In estimates of cost of reproduction of parcels of railroad property, the item of organization, administration and general expenses is usual. While I have not analyzed that in detail, it is usually assumed at 2%, and I think fairly so. That is customary with engineers in work to be done and in appraisals of existing property.

The item of engineering is also usual; allowance of 5% on entire cost, except overhead charges, would be fair and reasonable. That is an average; engineering on equipment would not be that high, but the average of 5% is fair and reasonable.

The item of interest during construction is also usual, and is arrived at by taking a fair rate of interest for the period covered by the average amount of investment, and taking into consideration that loss of interest extends to and even beyond completion of the work. It extends until the property is turned over to the operating department.

To secure right of way and construct South Shore in an expeditious manner, having due regard for economy, and taking into
564 account lack of facilities for access to the property, shortness of the seasons, and extent of the work, it would take more than three or four years to complete; if it took three years, the entire expenditure would average an interest period of 1.5 years, or, if four years, an interest period of two years.

As bonds of established railroads can be bought to net 6% or more, I do not see how South Shore could get the money for less than 6%, and it might have to pay more; this rate is conservative, interest on three year basis would be 9% and on four year basis, 12%.

LOWETH.

Cross-examination.

By Mr. Wykes:

We began construction of 25 miles in Upper Peninsula last spring, and I don't see how we can turn the property over for operation until next fall. Section 1 is 11 miles out of Crystal Falls; section 2 is the balance, to Iron River.

In reconstruction of South Shore, I am as sure as I can be of anything that has not occurred, that we would have casualties, accidents involving injury to persons and property, and contingencies for floods; I don't doubt there is considerable material, the exact character of which is not evident on superficial inspection. I don't see how that length of railway could be built without diversions in highways, streams and farm crossings. There would be contingency items connected with construction of the road over and across
565 other railroads, and crossing telephone and telegraph lines. In cities, both waterworks and sewers would have to be disturbed, and there would be other contingency items, more or less of the general character of those mentioned. There is such reasonable probability of these that a certain proportion will occur in every railroad that is constructed; they will vary with the conditions of weather, the season and the character of the country. If all conditions were favorable the contingency item would be smaller. The items of farm and highway crossings and pavements in cities assume the passing through a settled territory; if territury was sparsely settled, their possibility and the percentage for them would be smaller, and other contingency items would be more *that* the usual contingency item, in increase of earth work on that account; the inaccessability for supplies and men, difficulties of getting and hold-

ing labor and getting supplies, would be enhanced a' ove what it would be in any other section within a radius of 500 or 1,000 miles.

In casualties, where work is done on contract, those that occurred on contractor's work would enter into his prices and he would bear them.

If contractor on our 25 miles in Upper Peninsula injures someone, his 25.5¢ for grading must bear that, if financially able. If they fail, the railway company has a contingency item there that is often considerable. Under favorable conditions, the contingency item might be as little as 5%, and it might be 15%. From the
566 nature of the case, the contingent item cannot be stated with certainty.

There are many items that might be treated as items of contingency that subsequent inspection for appraisal will develop—that there was an expenditure on account of something that could not be foreseen when the road was planned and contract let. If sufficient time is taken and expense incurred to make survey of the property, and all factors were carefully investigated, the element of contingencies would naturally be reduced, but that is rarely done. The degree of thoroughness with which such an investigation is made will govern, largely, the extent of contingencies.

Q. The purpose of my question was not to indicate that you must go and take the measurements, but that the contingent item on a road like the South Shore, parts of it of comparatively recent construction, instead of going off into Iowa and Illinois and other states to furnish hypothetical cases of what might have come in by way of contingencies, the facts as to what contingencies actually occurred on this road can be pointed out, and so I wish to base on that this question: Assuming that a large part of the South Shore line was constructed as late as 1887 and after that, and people who were with the road when it was constructed are still alive, wouldn't a nearer approximation of correctness be arrived at by calling those people as witnesses as to what contingent items actually occurred *that* it would to speculate on them?

567 A. That would in a measure determine the contingencies, yes sir. But I contend that in a piece of construction through the northern Peninsula and identical with the D. S. S. & A. couldn't be inventoried today and get all of the items or elements that entered into its cost. It seems to me impossible to do it. Conditions change, and you cannot tell when you look at an embankment how much is under the surface of the ground, on either side, unless you go to a very large expense and make tests and excavations to determine that.

In any event, a percentage is necessary, and 10% expresses my judgment of one sufficiently high to meet the average conditions.

So far as I know the experience of the engineering profession, those things are to be expected and necessary to be provided for in one way or another. I might have enumerated many other contingency items, many of which would almost surely happen in Northern Michigan.

In our valuation work, we apply prices for labor and material as of 1911, the longer period being better than a more definite date.

For work done within last two years, we had records of original cost, and took them as a criterion of prices assumed for valuation, in order that we could check up our assumptions for last year's prices with what similar material had or would cost under similar conditions.

I have not been over the South Shore for a couple of years; at various times I have been over parts of it, and I think at one time and another over all of it—some parts very frequently. I
568 was connected with the construction of Soo Line, Soo Sault Marie to St. Paul, and part of my knowledge of South Shore conditions is based on knowledge of Soo Line. I was Consulting Engineer of Soo Line when built, and for several years after.

I accounted for variation from 72¢ to $1.50 on solid rock, on our 25 miles, as there were 14 bidders; some were more anxious to keep their plant and equipment busy than others; some may have had work dragging over into this season, and were not anxious to take more without a very good price; contractors at beginning of season attempt to forecast the amount of work likely to come up and the necessity for them to make high or low bids to keep busy. Then there is the personal equation of the difficulty of estimating cost of work.

I don't think solid rock could be moved for 72¢ without loss, and the variation between 72¢ and $1.50 was the difference in judgment of men willing to do the work. There is necessarily a variation in judgment of engineers as to cost of doing a particular item of work; while the 25% difference between two engineers would be a strange case, estimates might vary as much as that. There is no possibility of that difference in estimates fairly made by competent men; there might be, possibly, a variation of 10%; while there are very large variations in the bids for any one of these particulars, the aggregate of the bid, taking all of the work into account, is less than the variation in the bids for any one item.

569 Q. Haven't you noticed that in the source you take for your price there is a variation of 10% or 20%; perhaps at times you might look to one source and find one price and to another source and find an entirely different price, and they would vary say 20%?

A. That is frequently the case; not always the case.

Q. I don't mean that it is always the case, and couldn't a competent engineer honestly take either one of those sources, perhaps?

A. Well no, he would have no right to take the lowest bid.

On 600 miles of road, the competition would be restricted to a fewer number of contractors than the 14 who bid on 25 miles. I don't think we would get competent, experienced, financially reliable contractors equal to half this number. It would be let in a single contract on the idea of sub-contracting; that is general practice. The advantage of this is to have men of ample means and financial responsibility to stand between you and the financial loss that may occur in dealing with small contractors.

In building up shoulders, digging out cuts, putting in side channels, etc., after work of construction is complete, the practice is to

follow I. C. C. rules, charging to maintenance all expenditures for keeping original standard of roadbed. Anything improving standard is a proper charge to additions and betterments. In cases where original construction is incomplete, it is proper to charge to
570 additions and betterments work which it was necessary to complete.

If a bank was widened after completion, the charge would be to additions and betterments, while, if original banks were swept away by a flood the charge of replacing would be to maintenance. In a contract for grading 219 miles from Missouri River, in South Dakota to Black Hills, overhaul on earth work amounted to 7.5%. In a part of the work in Missouri the contract price for filling bridges was 27¢ but the overhaul brought the cost to 50¢ a yard.

That would not be comparable with a line where they were making a grade, but it has a bearing, as every railroad has to fill in earthwork after contractor has gone ahead, leaving temporary bridges. Certain places are frequently found where the bank of earth is a long one, and a temporary trestle or bridge is made to carry the traffic for a while, and afterwards it is filled in at heavier cost than contract price.

The amount of subsequent filling depends on the country—if the ground it firm, little filling is required, if there are swamps and marshes, more is necessary. The 219 miles I spoke of would not compare with South Shore, as that was a cheap line, with narrow banks and shallow cuts.

The South Shore overhaul would probably be much more than 7.5%, whether paid to contractor or done later by railroad, as there are many swamps and marshes to which earth would be hauled from long distances.

571 I have made no calculation with reference to South Shore.

In fixing a price of 30 cents, I considered the item of overhaul. The contract price was 23¢ on the first 11 miles, and 27¢ on the balance. The overhaul on the first 11 miles was estimated at $3,660. The estimate on the last part was not complete, as we had not finished our profiles for the farther end of the work, nor some spurs and branches. Those parts not surveyed were called to the attention of the contractors when they made their bids. The overhaul was one of the considerations inducing me to raise average prices to 30¢. The shrinkage was not considered for that would be included in estimate of quantities.

There has been a decided increase in the price of grading and labor. Last year, we paid $1.75 a ten hour day for labor. This year, we have paid $2 to $2.25. Labor today is higher than 10 years ago, but I don't think it is higher now than average for last 10 years.

A railroad is, in many cases, worth more than the cost of replacing it, as where it has a large and profitable business. For rate fixing purposes, an investor is entitled to a fair return on his investment, as it is not his fault if the business is not there. The investor is entitled to the same appreciation in the investment that could be fairly gotten in any other fair field of activity. Measuring value of

this road by reproduction cost, it would have been worth one price in
1906, when wages were very high, a lower price from 1907 to
572 1911, other things being equal, and a higher price this year,
when labor is again high. The fluctuations are generally balanced by changes in other conditions, so the total value is not greatly affected.

The general trend of prices of material and labor has been upward for more than ten years, but it is possible that the difficulties in reaching the country, and the poor construction facilities, would fully offset cheapness of labor and material years ago, so that the cost at that time would be as much as or more than, now. I think that is a general rule with railroad buildings.

Some items of expense, as labor and material, would be much heavier today than when our road was built, but rails cost less today. Real estate is also much higher, because the road developes the country.

There is no question but that in the majority of cases the cost of reproduction new, today, would exceed original cost. This is due to the higher cost of wages and material and because every railroad must make constant improvements, which are charged to additions and betterments. When I make that statement, I have in mind original cost of everything today, as compared with reproduction cost figured as an appraisal. The general advance in prices is a serious problem which raliroads have to face.

The 30¢ I have figured for grading takes into account the fact
that throwing on the market 600 miles of such work would
573 cause an increase in price, of 5%. If the work was done in
sections, not all at once, this element would be reduced, but not as much, as the cost of reorganization is heavier; the labor supply is limited, and must all come from the south. I have built two ore docks at North Escanaba, since being with St. Paul. The first was enlarged after I got there, taking one season. It took two seasons to build the second one. It was possible to use the part finished at the end of first season; I don't know as we did.

The 12 miles of double track, Marquette to Ishpeming and Negaunee, and ore docks could be built within a year, provided plans were made to work at proper seasons. Plans would have to be completed in early summer, so work could be pushed entire eight months of open season; otherwise it could not be finished in one year.

On 200 mile Iowa contract, grading prices range from 20¢ to 29¢. The work was done in sections, the past year. The longest section was 20 miles. I have some of the data on those sections. In those contracts, the construction was along our presently operated line, and all material, machinery, labor, etc., was hauled to the camps by the company, without charge to the contractor. Spurs were built off main tracks, and tools and equipment delivered without charge. The cost of their delivery was heavy, but there are so many intersecting lines in Iowa that, had we not done this for contractor, he would not have had to haul his supplies far. In our Puget Sound
line, contractors had to take their supplies and shovels many
574 miles across country. The prices always vary depending on
cost.

Competent engineers might vary on track laying and surfacing, depending on their acquaintance with the work, or by the amount of observation. It is a complicated question to figure cost of those items, as many things enter which can be easily overlooked.

I would not expect two competent engineers, both honest, to come within 10% of each other on these items, unless both had been through an experience of track laying, recently, and had taken care to examine the question thoroughly. Even then, one may give a different weight to the same considerations than the other does. I used the best judgment I had in fixing my estimate, and I am not surprised that Riggs and I differ $270 per mile. Other engineers have made it even lower than Riggs. This same uncertainty enters into other items of railway construction, and other engineers, whom I believe equally competent and honest, and who have had considerable experience, have fixed prices in some cases much lower and in some cases higher than Riggs and I have fixed.

I went into it with much care, and was surprised at some of the items that I found entered into the cost of construction. A more careful analysis might produce more. If Riggs valued the Marquette car shop at $20,000 at practically the same time, in 1911, that it was built at a cost of $16,000, that is too much variation.

575 No general rule can be infallible when applied to specific instances.

In the application of the I. C. C. rules, the judgment of the engineer or auditor is exercised as to what account the charge is to be made to. Sometimes it is close to the line, and a consultation has to be held.

If Riggs valued engine number 37 at $3,366, and it sold in the same year for $1,600, I should consider that an unreasonable discrepancy. The value should be gotten at with less difference than that. The trend of locomotive prices has been up for 10 years, as has the price of freight and passenger cars.

I stated 26.5% to be the aggregate for overhead charges, beginning with contingencies, including interest during construction at 9%, and ending with legal expenses. There have been appraisals which fixed this lower, and some, I think, as high.

In reports to railway commissioners of Wisconsin, South Dakota and Minnesota, which I furnished for our roads, I used lower overhead charges than I have stated here, because it was a new matter then and we made mistakes. We reported engineering charge 4.5% in Wisconsin; 5% would be conservative.

There would be one to two years of taxes on the incomplete road not included in this valuation. The figures I reported in the other states for overhead charges might be one half less than those I have given here.

576 But in Minnesota the report has gone through a process of evolution—at first it was made hurriedly, without a thorough examination; as more information was asked for, we have gone into it more carefully, and found omissions from former reports. At first we didn't know whether our report was to be used for taxation or rate making, and at all times we tried to make an honest

valuation. There has been little, if any, controversy between us and the Commission.

Engineers should not vary as much as the difference between $60 and $35 for bridge timbers in place. I have no doubt that on individual items there may be a greater variation than 10% between Riggs and myself; such a difference does not reflect on either of *is*. A difference of 25% may exist between engineers, both competent and honest; there should not be this much difference on the entire work. The amount of difference depends on the degree of investigation and reliability of data. I believe my information is full, and data accurate.

An example of obsolescence in bridges is a frequent necessity for replacing bridges intended for light traffic. Some bridges cost less to maintain than others, and this is the reason for replacement of many. I don't see how you could take into consideration the fact that the company intended to replace it next year, when you were fixing its value. A bridge is a composite structure, and may be continued in service indefinitely, by replacing parts that give out. In many cases, it is wise to replace the entire structure with a better one, ever
though it could be made to last longer.

577 If, at the date this valuation was made, South Shore intended to replace 73 of their bridges at once, the life of those bridges should be figured up to the actual date of replacement. I have in mind a bridge on the St. Paul which we started to replace with a fill three years ago, but, because of wet soil, we have had to repair it and let it stand. You cannot tell how long it will take to finish the replacement of a bridge. In valuing the bridge mentioned, I should have taken as its life the period to which it could have been made to carry the traffic with reasonable repairs, rather than the period to which it was reasonably indicated it would carry it. Ballast depreciates slightly, and either has to be replaced with new or there will be an increase in the cost of maintaining the tracks. There comes a time, after new ballast is put in, when it becomes worthless as ballast, or involves a slight increase in the cost of track upkeep. Whether or not it is worthless depends on whether the road can afford to buy new ballast. The old answers the purpose, but, in good railroad management, it should be replaced with new.

Ballast gradually goes into roadbed and makes it more permanent, but there comes a time when the roadbed has appreciated to its maximum because ballast is driven down into the earth and forms a hardened coating.

That coating reaches its maximum value for all time, and does not increase the solidity of the roadbed after a certain period. That
period is reached in 10 or 12 years, or less if the traffic is
578 dense. But, even then, new ballast must be put on. In three
years after ballast is put on, it may depreciate 25%, depending on traffic and standard of roadbed required. New ballast is put in because it is generally cheaper to put in new than to screen or clean the old ballast with ballast forks, as is sometimes done.

It requires heavy expense to clean ballast. That ballast gets mixed

with dirt is the reason for its depreciation; that is the function of the ballast.

Expense of maintenance is due, in a measure, to both train movement and action of elements. The relative effect of either depends on amount of traffic—the effect of weather on the roadbed where traffic is light is relatively greater. Climate also makes a difference; but, regardless of climate, a large percentage of cost of maintenance of way and structures is due to the elements. In many cases the action of elements causes more damages than traffic.

Contractors' bids furnish good evidence of value of work, but you must remember that where the bids are competitive, the price is forced down. Bids should represent range of value, if made by experienced men, without collusion. It would not be fair to take the bid on a certain part of the work, but it should be taken on the whole, as some contractors have special facilities for doing certain portions. In arriving at a fair price from bids, you should average those close to each other, and eliminate those abnormally high or low.

579 Taking the 14 bids for removal of rock ranging from 72¢ to $1.50, I should start at the lowest and average on half or three fourths of them, leaving out the highest. That's a fair method, and should represent fair value of the work. You could average bids which were regularly graduated in this way also, but, in each case, I should use my own knowledge of the work and my judgment as an engineer. Each man's judgment has entered into his bid, but they vary from 25% to 100%.

In arriving at the price of 30¢ for grading, I took the price at which I let the bid and included my judgment of the overhaul, local conditions, etc.; a large factor in fixing the price was my own information and judgment.

Some engineers have considered 17¢ a fair price for some kinds of grading. I think each railroad would have to be considered separately, as much depends upon conditions, and, if this were done, each location on a railroad would have to be considered separately.

We can use steam shovels for about 25% of the 25 miles we are building in Michigan. Steam shovel work is more expensive, because it is possible to do work which otherwise would not be attempted. By the use of steam shovel, taking it per yard, the cost is less than by other method.

The prices I gave were for 1911; there was little variation that year. The prices would have been about the same for two year period (1910 and 1911).

Prices were generally higher in 1909, and have been higher in 1912. The bidding on this contract in the Upper Peninsula was in the spring of 1912. The prices are higher now.

580 LOWETH.

Redirect examination.

By Mr. Butler:

Referring again to the bids for moving the solid rock, they included clearing, grubbing and loose rock. You could not separate in that list of bids the range of prices for any one of the items and draw a fair conclusion, because certain bidders may have special facilities for doing parts of the contract. Each man bids with the entire work in mind, though on one part he may put a low and on another a high price. Bids cannot be forecasted, even where great care is used, as the contractor bids on his own figures and judgment. It is called an unbalanced bid, where there is great variation; engineers try to avoid such bids.

The roadbed appreciates substantially in value as an operating instrumentality if properly maintained for a period of years. Sinking of ballast down into soft places in roadbed like South Shore improves roadbed, and addition of new ballast brings it back to former standard, and makes it better than before.

It is a question of business policy whether a bridge in 60% condition, which can be maintained for an indefinite period by repairs and renewal, shall be taken out and replaced by a fill or better bridge.

The problem depends on traffic, financial power, policy of management, etc. Each instance must be decided for itself. Obsoles-ence may result from various causes. Even where rail was 100%
581 condition, it might have to be replaced because of heavier traffic.

An old road, well maintained, is worth more as an operating tool than a new one, and it cannot be said that a road is worth less than cost, if economically built and well located. It is worth more as time goes by and roadbed seasons, although part of the life of its parts has passed. The appreciated value relates principally to roadbed, but could include structures, buildings and bridges. The organization of the road and its management also becomes more proficient. The value of the "going concern" depends upon location, efficiency of organization and facility for handling business in each case.

A partial investigation has resulted in finding that it costs a cent a yard, of grading done, to transport contractor's equipment and men. The overhaul on our contract amounts to 12%, or 3¢ of the 26¢, which is the average price of both sections.

That contract consists of two sections, the length of one of which was known, the other not. The average is 26¢ now, which, added to 3¢ for overhaul and 1¢ for transportation, makes a total of 30¢.

I don't think the item of interest during construction should be lessened by earnings of road during that time on South Shore, because operation would interfere with construction, and make it cost more.

582 On our Puget Sound extension, we, of necessity, put on revenue trains before line was completed, because it meant the

building of permanent towns on the line resulting from heavy immigration that year. I don't see how we made any profit out of it, though I haven't the figures.

LOWETH.

Recross-examination.

By Mr. Wykes:

Ballast depreciates, to an extent. Part of the new ballast applied takes up depreciation of the old, and part improves the roadbed over the old standard.

Where it is a betterment, it should be so charged, and not to operating expenses.

My price of 30¢ included overhaul, and no overhaul should be added after the application of that price. I think I stated yesterday, that there would be some overhaul added to the 30¢ including overhaul, I referred to the price we paid in Iowa. When I fixed a price of 30¢ on South Shore, I did not intend to include overhaul. I did, however, intend that the contractor would do the work without free transportation of men and material, as we gave in Iowa. (Mr. Wykes: It stands in the record that you answered me twice that you did include overhaul in the 30¢, and also that you made that figure of a combination of 26¢ for grading, 3¢ for overhaul and 1¢ for transportation.) If it so stands, I ask that it be corrected to correspond with my present statement.

When I say a road cannot be operated profitably during construction, I do not mean that, if a part or section of it is thoroughly
583 completed and traffic is there, it cannot be operated profitably. That is the natural result of roads being constructed in sections. In such cases, operation should be profitable, and that part should be taken off the interest-bearing charge, and sustain itself.

584 (The parties admit that the 1911 value, as stated in Complt.'s Ex. 1, Riggs, is correct: Schedule 33, Miscellaneous Equipment, pages 279-280; schedule 20, Shop Machinery and tools (Mich. and Wis.), pages 213-219 and 317; and schedule 21, Roadway and Construction Tools (Mich. and Wis.), pages 220-225 and 317.)

585 On November 15, 1912.

ALBERT H. HOGELAND, a Witness called by Plaintiff.

Direct examination

By Mr. Butler:

I am 54 years old and live at St. Paul. I am a civil engineer, with 33 years' experience. I graduated from Lafayette College in 1877; have been continuously in railroad engineering work in Wisconsin,

Minnesota, Dakota, Idaho and Oregon. I am now Chief Engineer of Great Northern, which position I have held ten years.

I have been employed by that road 28 years, in which time the great majority of its mileage has been constructed. I have been engaged in estimating cost of reproducing new its existing railroad properties. I am not familiar with South Shore, except that I know its location. Our road has much mileage in Minnesota, in vicinity of iron ore deposits.

The proper unit price per yard for removal of earth varies with conditions, the cheapest being on level prairie, where fill is light, where earth is generally put into the roadbed from the sides by grading machines, which reduces cost. The higher cost is present in more rolling country and where earth is taken from cuts to fills. In swamps the cost is greater because of wet soil and tendency to settle.

The unit price on grading includes free haul for a certain distance, with an amount added for greater haul. Other things increasing cost are transportation of outfits, men and supplies,
586 ditching, channel changing, etc. I have investigated additional cost to a railroad over amount paid contractor.

We examined contracts and records of Great Northern lines built from 1894 to 1907, in Wisconsin, Minnesota, North Dakota, Montana, Idaho and Washington—total, 1,500 miles. Average grading price paid contractors per yard was 33.6¢; adding cost of transportation and extras charged against grading, the average cost per yard was 44.1¢ showing a difference of 10.5¢ per yard for every yard moved above yardage unit prices paid contractors to cover entire grading cost. Total contract amount of earth was 47,278,121, the price varying from 19.3¢ for earth to 94.7¢ for solid rock. Experience shows that we must add 10¢ a cubic yard, or, in this case, about 30%, to cover the entire cost. Average yards moved, per mile, was 30,000; amount of excess cost varies with the country.

In the 19.3¢ average, the bids vary from 13¢ to 36¢. I don't think there has been much change in price of grading in last 10 years, considering the use of improved machinery. A fair price for earth work in iron country north of Duluth is 36¢ a yard, without overhaul, force account or other extra charges. That is for heavy work, and yards per mile run more than 30,000. My estimate of 36¢ was based on specific contracts, varying from 35¢ to 42¢ for earth work.

The estimate of reproduction cost of a railroad should include items for contingencies. We found that during 5 years, 1903-1907, the
587 total amount of additions and betterments to the Great Northern was estimated at $25,223,738.65, with an actual cost of the work of $29,096,067.47, an increase of 15.35%. The estimates were itemized in detail, and the engineers were familiar with the work to be done. That was the average; some actual costs fell below estimates. The estimates were made by competent assistants, and the work carried out by different, best fitted, departments.

I included 10% for contingencies in my inventory of Great Northern in items in which labor entered largely. Addition was not made to equipment items. The 10% contingency addition was fixed by

me upon my investigation which, showed an increased cost of 15.35%. Mr. Morgan, State Engineer, allowed 5% for contingencies on everything, which amounts to more dollars than my 10% allowance on principal labor items. In that litigation, the attorneys for the State contended there would be no allowance for contingencies, disagreeing with their engineers; my examination was made because of their contention. If valuation has been done with average care, 10% for contingencies would be sufficient; otherwise not.

I intended this 10% addition to be made only on items involving a large amount of labor, and not on all items. An allowance of 10% for contingencies on all items has usually been given in appraisals where the estimate was not based on complete records. I added 10% to some items, only, because our records were quite complete, and two thorough examinations were made.

588 We allowed 4.5% to cover engineering and legal expenses. Engineering expenses had been included in equipment item; 4.5% was applied to right of way and structures along the track, not to equipment.

In allowing for interest during construction we assumed it would require eight years to reproduce 2,000 miles of main line track in Minnesota. We allowed 6% a year for four years on everything except equipment. On that, we allowed 5% for two years. Mr. Morgan, State Engineer, took same periods, allowing 4%. The total allowed was 24% on all except equipment, and 12% on equipment. The court adopted Mr. Morgan's estimate of 4% a year. It now costs Great Northern 4.25% to raise money for improvements. It would cost more to obtain money for a new enterprise, without any credit; 6% would not be too high.

We did not consider depreciation; I do not think that should be taken into account in arriving at the value of railroad property. As an operating instrument, depreciation should not affect the value, e. g., Northern Pacific and Great Northern both have lines from St. Paul to Puget Sound, built for years, while C. M. & P. S. has built a line within two years. It is unfair to say either of the old lines was not worth as much as the new one. My opinion is that appreciation of track, roadbed, etc., offsets depreciation.

589 The maintenance cost of a new road is greater than of an old road, as roadbed of the latter is more permanent. The old road can be operated more cheaply than a new one, and the value of its use is therefore greater, assuming everything to be equal.

We allowed nothing for taxes during construction. In Minnesota, taxes are on earnings, and are not applied during construction. If conditions were otherwise, I believe such taxes should be included. Assuming a period of four years, and that South Shore is paying $200,000 taxes per year, the allowance should be $400,000. I do not know whether a new road would be taxed in Michigan before operation.

HOGELAND.

Cross-examination.

By Mr. Wykes:

The figures I have given were made for the purposes of Minnesota litigation. There was a variation between me and other witnesses, especially Mr. Morgan, on unit prices.

If a thorough examination of profile is made the contingency item would be decreased. The engineer should include in his inventory things visible and things he is reasonably sure happened. The items which could not be discovered should be covered by the contingency allowance. Every means ought to be used to discover and list items and quantities that have actually gone into the work; things should not be included that we do not absolutely know have gone into it, as it is covered by contingencies. I do not believe anything has been included twice. In favorable country, years afterwards,
590 where earth had gone into sink holes, out of sight, it would be taken care of in contingencies.

The unit price of 19.3¢ for earth was obtained by dividing the cost by the number of cubic yards moved, not including overhaul. Work done by the company was not included. The period covered was from 1898 to 1907, and all the lines on the system were included. There were 38 pieces of work, and the prices varied from 13¢ to 36¢. The 13¢ price was on a job in North Dakota, built in 1904; the next higher price was 13.3¢, for 46.97 miles in North Dakota. In getting the average, we multiplied the quantity on each line by the price per yard; those tables were all added and divided by the total yards, in order to arrive at the average price. A larger amount moved at the smaller price would have decreased my average of 19.3¢ or vice versa.

Some of my prices vary greatly, as, for concrete, from $7 to $12, depending upon length of haul, time of year, etc. Even knowing exact conditions, there would be some variation between engineers. I am not prepared to say, with the information I have and the distance I am away, that in a particular structure on South Shore concrete price should be $7 or $12; the same might be said of other unit prices.

In arriving at 15.35% as average excess, on certain contract work, of cost over estimated cost, we included all work done on system for years 1903 to 1907. I don't know that the work was carried out in each instance as contemplated; changes might have been made. In some cases, the cost underran the estimate.

591 In 1904, actual cost over-ran the estimated cost 16.65%, In 1902, 15.65%; 1905, 14.04%; 1906, 17.34% and 1907, 11.62%; an average for five years, 15.35%. The estimates of each engineer might vary from a minus quantity to over 40%. There is a large variation in the estimates which cover spurs, sidings, second track, bridge filling, new buildings, etc. It is quite likely that the

same percentage *or* variation would occur in estimates of a value of a constructed property for purposes of appraisal.

The table I prepared was for the purpose of justifying a contingency item. The size of the contingency item would vary with the degree of care used. No general contingency percentage should be applied, as every case ought to stand on its own bottom. As a mere opinion, I should think that South Shore would be justified in using 10% on entire estimate; I know nothing of the conditions.

The amount of interest would vary with the amount of line to be constructed, as that would determine the length of time it would take. We figure interest for full investment, half the time. In Minnesota figures, we had 2,056 miles; as that mileage is diminished, the time would increase.

HOGELAND.

Redirect examination.

By Mr. Butler:

After contractor goes away, the cost of removal of additional earth would be about the same as the contract price though, in some cases, it might be cheaper.

592 The time required to construct a road would depend on conditions in each individual case and not entirely on the length of line. I was mistaken in saying that the C. M. & P. S. was built in 2.5 years. It took nearly four years; they worked from both ends, and transported materiial over two other parallel lines.

593 On January 21, 1913.

JAMES MANEY, a witness called by plaintiff.

Direct examination.

By Mr. Butler:

I am, and have been, General Passenger Agent of plaintiff since Jan. 1, 1912; previously, from June 1905, I was assistant to General Passenger Agent. I have been with the company 29 years, having been Chief Clerk and Rate Clerk in passenger department.

I am familiar with the road, its operation of trains, connections, etc. (Time card, effective Jan. 5, 1913, marked Complt.'s Ex. 56, Maney introduced.) Prior to that time, for some years, the operation of the trains has been substantially on the same general plan as indicated by that time table.

Trains going west are given odd numbers, and east even numbers.

(In answer to specific questions, witness testified to the following things with regard to trains, operation, etc.)

Train No.	From—	To—	Comparative character of business.	Predominating business.	Time.	Record pages
1 (c)	St. Ignace.....	Houghton.....	Fair compared with average; neither heavy nor light.....	Intrastate.....	Day.....	3680-81, 3694-95
2 (c)	Houghton	St. Ignace.....	Ditto	"	"	3680-81, 3694-95
3 (a)	Marquette.....	Houghton.....	Good; above average.....	"	"	3680-81, 3695-96
4 (a)	Houghton.....	Marquette.....	Ditto	"	"	3680-81, 3695-96
5	Michigamme.....	Duluth.....	Below average.....	"	"	3682, 3696-97
6	Duluth.....	Michigamme.....	Ditto	"	"	3682, 3696-97
7 (b)	Soo.....	Duluth.....	Above average.....	" (1)....	Night.....	3682-83, 3697-98
8 (b)	Duluth.....	Soo.....	Ditto	" (1)....	"	3682-83, 3697-98
10	Michigamme.....	Marquette.....	"	"	Day.....	3684, 3699
11 (d)	Marquette.....	Michigamme.....	"	"	"	3684, 3699, 3708
110 (c)	Ishpeming.....	Marquette.....	Below average.....	"	"	3685, 3689
111 (l)	Marquette.....	Ishpeming.....	Ditto	"	"	3684-85-89
13 (f)	Nestoria.....	Houghton.....	Above average.....	"	Night.....	3685, 3700
16 (f)	Houghton.....	Nestoria	Ditto	"	"	3685, 3700-01
14 (g)	Soo Jct.....	St. Ignace.....	Good during 3 summer months; rest of year, average.....	"	Day.....	3686-3701
15	St. Ignace.....	Soo Jct.....	Ditto	"	"	3686-3701
43	Soo	Soo Jct.....	"	"	"	3687-3706
44	Soo Jct.....	Soo.....	"	"	"	3687-3706
103 (h)	Champion.....	Houghton.....	Below average.....	Interstate.....	"	3687-88, 3702
104 (h)	Houghton.....	Champion.....	Ditto	"	"	3687-88, 3702
105 (i)	Marquette.....	Champion.....	"	Intrastate.....	"	3688, 3704
106 (i)	Republic.....	Marquette.....	"	"	"	3688, 3704
51, 143	(j) Soo	Soo Jct.....	"	"	.....	3690, 3707
18 (j)	Soo Jct.....	Soo.....	"	"	.....	3690, 3707
9	Marquette.....	Ishpeming.....	"	"	.....	3690, 3707
12 (h)	Ishpeming.....	Marquette.....	"	"	.....	3690, 3707

THIS PAGE BOUND VERTICAL IN BOOK

595 (*a*) Negaunee to Houghton, cars are C. & N. W. and locomotives South Shore; train is operated over C. & N. W. line to Negaunee, where South Shore puts on its engine and crew. Train does local business between Negaunee and Houghton; South Shore gets all the fares, and some payment from C. & N. W. Sleeping and dining cars between Negaunee and Houghton run between Chicago and the Copper Country.

(*b*) Carry sleeping cars and diner.

(*c*) Dining cars entire distance; sleeping car St. Ignace to Soo Junction.

(*e*) Sleeping car for Marquette from Chicago; this is a C. & N. W. train, operated by their crew and engine; South Shore gets the fare.

(*d*) Chicago sleeper via Champion and the C. M. & St. P.

(*f*) Connects at Nestoria with 7 and 8; sleepers out of Houghton on 16 for Duluth and Mackinaw; sleepers into Houghton, from Duluth and Mackinaw, picked up at Nestoria.

(*g*) Connects at Soo Jct. with 43 and 8, and at Trout Lake with Soo Line.

(*h*) Through route, Chicago to Copper Country, via Champion and C. M. & St. P.; does some local business between Champion and Houghton; handled by South Shore our crew and engine, and South Shore receives the revenues, and something additional, from C. M. & St. P. sleepers and diners.

(*i*) Same as note (*h*) except junction at Champion or Republic, and no sleepers or diner.

596 (*j*) Connects at Soo Jct. with No. 1.

(*l*) Handle Lower to Upper Peninsula travel, and have a good deal of sleeping car business for intrastate passengers.

Sleepers from Lower Peninsula are handled on 1 and 2 and not on 7 and 8; that sleeper goes to St. Ignace; 7 and 8 handles St. Ignace sleeper to Mackinaw City.

Service substantially the same has been maintained on South Shore during past four or five years, except on trains 6, 8, 13 and 16. We are now operating daily sleeping car service between Houghton and St. Ignace, where, previous to a year ago, service was tri-weekly. There is no sleeper service in the winter. There are additional trains in summer. This summer we operated two Sunday trains between Marquette and Michigamme, 38 miles, and two between Duluth and Bibon, Wis., 72 miles, one each way—local for resorters.

I have frequently been over plaintiff's line in Michigan. I regularly receive, from accounting department, reports concerning results of operation of passenger trains, the earnings and the like; some are daily statements, and some more frequently; they have reference to daily passenger earnings.

Monthly reports show earnings by trains. In a general way, I am able to form an opinion as to the volume and kind of business of these trains during the last three or four years. I have not kept any statistics.

597 Complt.'s Ex. 57, Maney, is a list of passenger tariffs filed with the Michigan Railroad Commission, in effect July 1,

1912, and is now in force. It correctly indicates the Michigan tariffs on file with the commission.

(Agreement that tariffs on file may be used by either party, by being produced and called to the attention of the opposite party.)

Complt.'s Ex. 58, Maney, is a list of tariffs on file with I. C. C., including supplements.

Practically all local normal fares in any state, sometime or another become a part of or are used in the making of, interstate fares or rates.

Complt.'s Ex. 59, Maney, is the local passenger tariff of D. S. S. & A. in effect middle of 1911, with supplement 14 and was prepared by me, or under my direction, and states the fares and distances between all stations on our road.

Complt.'s Exhibits 57 and 58, Maney are lists of tariffs except one lately issued, effective June 1, 1912. (This tariff produced and marked Complt.'s Ex. 60, Maney.)

In addition to the tariffs referred to, there is one promulgated by other companies, which passes from points on our line to points on other lines. With that exception, all tariffs promulgated by foreign lines are from points on the promulgating line to points on our line. Our tariffs are one way fares, as illustrated by Complt.'s Ex. 60. Fares between the same points in opposite directions frequently differ.

598 Foreign lines, making rates from points on other lines to points on ours, use our local fare over the part of the line used in the route, as a component part of the through fare, in a majority of cases. The short line is the rate maker; the long line between the same points, to get business, meets that fare; that is uniformly the rule.

Between Sault Ste. Marie and St. Ignace, Soo Line furnishes a shorter route, South Shore being 90 miles, and South Shore and Soo Line, via Trout Lake, being 72 miles. I don't believe that we have any other similar situation in Michigan.

In Wisconsin, although plaintiff is not compelled by law to carry passengers at 2¢, it is compelled to do so through being paralleled by competitive lines, which are on a two cent basis. The Northern Pacific parallels South Shore, being as near as two miles in places, Superior to Iron River, the distance between these points on N. P. being 43 miles, and on South Shore 45 miles. On points on South Shore two miles distant from Northern Pacific, it is necessary to apply the same fare as the Northern Pacific applied to station opposite.

Duluth to Ashland is also a competitive point; the N. P. is direct, Duluth to Ashland; our route is Duluth to Bibon, thence via C. St. P. M. & O., to Ashland. Our distance and fare, Superior to Bibon, are 67.1 miles at $1.34. In my opinion, we could not maintain a three cent fare to Bibon. The N. P. is the rate making line,

599 Superior to Ashland; that handles business from Superior to Ashland by way of Bibon; the fare is in effect via N. P., which would not permit us charging 3¢ a mile. We could possibly

maintain a three cent fare for short distances in Wisconsin, though not for any great distance. The N. P. competition holds us to its basis on all of the line west of Saxon, in both directions, which leaves us free only between Saxon and the state line.

(Witness produced tarriff issued by foreign lines, showing rates from points on South Shore to points on other lines.) The rates read to points on our lines and to points on other lines via our line. They attempt to cover all gateways; e. g., Mackinaw City to Marquette, $5.03, made up of $.50 for Mackinaw Trans. Co. and $4.53 for our local from St. Ignace to Marquette; that is uniformly true to points in Michigan through St. Ignace gateway.

On business through Soo gateway from, say, Buffalo, N. Y., the through fare would make over Chicago or Trout Lake and be applied via Canadian Pacific, through Soo. We would get per mile, about .0258¢, Soo to Soo Jct. we have to accept a prorate per mile, which brings that down to the figure per mile stated.

This is an application of the rule that the short line makes the rate. This particular case would cover Buffalo and points in New York, east, where the through fares would make over Buffalo.

600 It would not apply to all territory naturally tributary to the Soo gateways; for the territory directly east, e. g., Montreal, Canada, fares would make over Sault Ste. Marie, and we would get our full local, Sault Ste. Marie to Marquette, $4.53.

If two cent law was put into effect the rate from Montreal to Marquette, made up of a combination of the fare, would figure $21.20, being $1.43 less than existing rate. I don't think we could maintain the interstate rate at the present amount if we were on a two cent basis in Michigan, as the passenger could buy to Sault Ste. Marie for $18.10 and rebuy, or pay cash fare, Sault Ste. Marie to Marquette, and save $1.43. That would be true to all points on our line in Michigan, out to Montreal. The same condition exists on all business where fares make over St. Ignace.

Where the fare is made over the Soo it would be modified by the differential on account of the rule of the short line making the rate. It would, however, be the full cent a mile for all distances west of Soo Jct.

This illustrates how, at two cents in Michigan, a passenger, Marquette to Milwaukee, where present fare is $6.16, could save 11¢ by buying from Marquette to Negaunee $.24 and Negaunee to Milwaukee, $5.81, total $6.05.

Newberry to Toledo, the present through fare is $8.84 made up of Newberry to St. Ignace, 54.8 miles at 3¢. If local fare from Newberry to St. Ignace was reduced to two cents, it would be $.55 less to Toledo, passenger could buy twice and save $.55.

601 St. Paul to Houghton, via C. St. P. M. & O. to Bibon, present fare is $8.65, made up of our local from Bibon to Houghton, $5.35, being 2¢ in Wisconsin and 3¢ in Michigan. St. Paul to Houghton, plus our proportion of the $3.30 from St. Paul to Bibon, gives us less than 2¢ a mile for 72 miles, resulting in the rate per mile being reduced all along. That is because the business comes by a roundabout route. We still get 3¢ a mile in Michigan, but our

total revenue is less than our local rate. The difference arises outside Michigan.

In business to Copper Country from the east, via St. Ignace, we do not get our full local, it will probably average about 2½¢ a mile from the interstate rate. The amount varies, depending upon whether the rate makes over the Soo, St. Ignace, Chicago or Milwaukee; where it makes over St. Ignace, we get our local; where it makes over the Soo we get less than our local, though the amount is not a constant amount, it depends on the distance.

On tickets from Buffalo to Marquette, we get $4 out of a haul of 155 miles. From New York we would get less, on account of the greater distance, the rate being but slightly higher than the fare from Buffalo, e. g., New York to Marquette, $25.33, making over St. Ignace, we get $4.20 for 155 miles—slightly higher revenue than on the ticket from Buffalo. This is made up of $20.80, New York to St. Ignace, and $4.53, St. Ignace to Marquette, our full local for 151 miles.

602 Montreal to Marquette, via Soo, we get our tariff fare of $4.53; our full local. New York to Marquette, via Soo, we would get $4.20 out of a total of $25.33; the fare is made up of $20.80, New York to St. Ignace and $4.53, St. Ignace to Marquette. The route via the straits makes the rate from New York City; if it comes via Soo, we get the same amount, being our full local from Soo Jct. plus a prorate per mile from Soo to Soo Jct. The fare from New York to Soo Jct. is divided—$3.15, New York to Troy, for New York Central and the remainder on a prorate per mile, using 248 miles from Troy to Montreal, 625 miles from Montreal to Soo, and 46 miles, D. S. S. & A., Soo to Soo Jct. If the two cent law was put into effect in Michigan, I do not see very well how we could maintain the 3¢ fare from Soo Jct. to Marquette on interstate business, in view of the fact that the passenger could buy and re-buy. The through rate would be greater than the sum of the locals, where that is true, a passenger can, if he knows it, and wants to, buy two tickets, instead of one, and save money.

Marquette to New York, via Soo, first class fare is $23.61, we get $3.09, being a mileage prorate after deducting arbitrary of $3.15 from Troy to New York City, for the New York Central. This fare makes over Milwaukee, east-bound, which is the short route.

Marquette to Lake Nebagamon, 227.3 miles the fare is $6.00, made up of 3¢ for 147.9 miles in Michigan and 2¢ for 79.4 miles in Wisconsin. With the local fares in Michigan at 2¢, this would be $1.47 less, I don't see how we could maintain a $6.00 fare, as the

603 passenger could buy to Thomaston; Thomaston to State Line is 13.6 miles; state line to Defer, first Wisconsin station, is 2.1 miles; Soo to Montreal, Mich. is 300.5 miles, $8.90; Soo to Defer, $8.95; under 2¢ fare from Soo to Montreal would be $6.01. With 3¢ fares on interstate and 2¢ fares on intrastate, a passenger from Soo to Montreal would pay $2.94 less than the passenger from Soo to Defer. Newberry to Superior 352.9 miles the fare is $9.50, made up of 3¢ per mile for 244.4 miles in Michigan and 2¢ per mile for 109.2 in Wisconsin.

MANEY.

Cross-examination.

By Mr. Wykes:

The reason, generally, that I say 3¢ could not be maintained for the interstate traffic, is the facility with which a passenger could buy a ticket over the territory in which he could pay 2¢, and thus get out of paying the 3¢ that might be charged on interstate traffic, by breaking up his ticket purchases. In going from Marquette to a point in Wisconsin, he could buy at 2¢ from Marquette to Thomaston, then up from Thomaston to Defer at 3¢.

There are now rates in Michigan upon which plaintiff gets less than 2¢ a mile. This is true as to certain local fares, and there is quite a little interstate business in which we get less than 2¢ a mile.

Duluth to New York City, second class fare, $24.00, brings us 1.629¢ a mile, Duluth to Soo. It is divided on the prorate per mile via Montreal, after deducting $3.15 for New York Central,
604 Troy to New York, 416 miles Duluth to Soo; 625 Soo to Montreal; 248 Montreal to Troy; that same ticket is sold at stations intermediate between St. Ignace and Duluth, at slightly reduced through fare.

Newberry to New York, second class is $21.79. South Shore would get its tariff of $1.64. From our main line stations, Marquette and west, the prorate per mile basis obtains; as you work east, the fare makes over the Soo, the same as Newberry fare did, not to exceed the fare from Marquette.

The business west of Marquette is based on the Chicago rate; except from Champion to Negaunee, the fares to New York are made over Milwaukee; Marquette being intermediate Negaunee to Soo, would take the Negaunee fare.

The second class ticket is the kind sold in connection with steamship tickets. All steamship business is handled in that fare; the first class ticket from New York is about $2.00 higher. The first class fare would be proportioned between the companies in the same manner. Duluth to New York City, second class is $24.00; based on $16.00 from Chicago, that figures 1.715¢ per mile. We would get a prorate per mile proportion of that fare after deducting the arbitrary, New York to Troy.

It would apply in that case from New York to Duluth. You go east on the line, take Marquette for instance, and you have another basis entirely, you get local in there from Soo Jct. to Marquette; this business comes to us via the Soo, we get that, plus a prorate per mile, Soo to Soo Jct., and that basis would apply to the big end of business from eastern New York to Marquette.

605 We get our locals from Soo Jct. plus a prorate per mile from Soo to Soo Jct. For instance, we would get our local, Champion to Houghton, plus a prorate per mile up to Champion.

The mileage prorate division on the proceeds of those tickets would apply to all stations intermediate between Marquette and Seney, it is

understood that lines east of Soo are not to receive more than the tariff fare, or their proportion of the tariff, from the Soo.

McMillan is about the point where we cease to get our local fare to or from Soo Jct. and begin to prorate the fares to points west on a mileage prorate, the reason is that we are making the rate via the Soo, starting from Champion.

We cannot charge a higher rate than we charge for Marquette, and we use the mileage prorate until the rate makes over the Soo. The rates are always divided on the basis they are constructed upon, except in some cases there is an agreement for a different division.

On immigrant business, there is considerable on which there is a return of less than 3¢ per mile, and quite a little on which there is less than 2¢ per mile; on first class tickets, there is considerable business where the prorate per mile is applied, and the South Shore gets around 2¢ per mile. This condition applies to tickets sold on the South Shore to points in southern Michigan and Indiana, e. g. Houghton to Fort Wayne, the South Shore proportion is 2.28¢ per mile; Saxon to Fort Wayne, South Shore gets from Saxon to St. Ignace, for 308 miles, 1.8¢ per mile.

606 Defts.' Ex. 5, states generally, the method of division of passenger rates, in which part of the travel is on South Shore, between the participating companies. The business, where South Shore participated in the division on mileage prorate basis, in many cases yields under 2¢; I would venture to say that the majority was slightly in excess of 2¢. There is a varying rate from 3¢ down, dependent on the location of the station on South Shore. We have no trains handling exclusive interstate traffic, and none handling exclusive intrastate traffic; during summer season, we have two trains, 211 and 212, between Marquette and Michigamme, being Sunday excursion trains, which handle exclusive intrastate traffic.

Those are low fare excursion trains which charge fare of 50¢ round trip, Ishpeming to Marquette, as against regular fare of 88¢, and 75¢ Marquette to Michigamme, as against $2.28 regular fare.

In trains stopping at a particular station, you let off interstate or intrastate passengers, or both. We have stops in Michigan scheduled for only passengers west of Wisconsin state line. None of our trains stop for purpose of taking on or of depositing a passenger of a particular character, interstate or intrastate, they stop to deposit them, promise-ously; they may be all of one kind or mixed.

None of our cars, including sleepers, run over C. P. R. Passengers all unload on American side at Soo; they there take through cars hauled by Soo line. The business through Soo, east, is good at times of the year, but, as a general rule, it is very light;

607 particularly in winter; all our passenger traffic is lighter in winter.

We have no equipment going on to the C. & N. W. regularly; there is a C. & N. W. train operated from Chicago to Copper Country, of C. & N. W. cars; if passenger came out of Houghton at night, he would use our cars to Negaunee, and change to C. & N.W. there. The passenger from points east of Marquette going out of the state, south, would change cars at Marquette or Negaunee. The passenger from

between Wisconsin state line and Nestoria, going out of the state, south, would transfer to the through train at Nestoria, on afternoon service, or, on night train, would go through to Negaunee and transfer there to C. & N. W. train.

There is no passenger service on the Bessemer branch 2.23 miles. On Republic branch, Houghton to Republic, the only passenger service is one train, No. 106, out of Republic en route to Marquette; that is C. M. & St. P. train, from Milwaukee, that runs through to Marquette, via Republic; it does not run over that branch on the return trip. That service has been in there about 10 years. There is no passenger service from Negaunee to Volunteer mine. On the spurs for traffic purposes—49 miles for 1910, 50 miles for 1911 and 62 miles for 1912—there is no passenger service.

Marquette to Winthrop Jct., 17.33 miles, no passenger trains use south track between Eagle Mill and Winthrop Jct. we have no
608 passenger trains between Eagle Mill and Negaunee on south track, we have no passenger trains using south track from Negaunee to Winthrop.

I have a statement, for October, 1912, giving revenue per train mile for various passenger trains; these are estimates. "Local fares" means tickets between points on our line. The figures are determined from ticket collections the- are not the exact figures, but are not entirely arbitrary, being based on knowledge of part of the income. The ticket collections give an idea of what is being done, so far as the business is concerned. It is sufficiently accurate so I think I have a knowledge of the train income from the examination of these. These are reports made to me for information of the officers.

(Sheets produced and marked Defts.' Ex. 6, Maney for July, Ex.7 for October, and Ex. 8 for November, being reports of train earnings.)

West of Nestoria, on main line, called Western Division, our interstate business is the greatest. The intrastate business on that division is quite light, due to lack of population—the local business is very light. I cannot give the relations between the inter and intra business there. The inter business is much greater, in my opinion. In my judgment, July, due to through summer traffic, would show a larger amount of interstate business; the interstate
609 passenger business predominates on the division east of Marquette to Soo and St. Ignace. Marquette to Houghton is where we have what population we have. This is through Negaunee, Ishpeming, Champion and Michigamme. The testimony with regard to the predominance of intrastate business on trains 1 and 2, St. Ignace to Houghton, would include both divisions.

On the Houghton Division, the intrastate business would predominate; there is considerable local travel there. The intra business might be close to twice the inter business on that division; if it is two to one for the whole state, it would be much more than that from Marquette to Houghton.

Mr. Wykes: That would necessarily be true, if he is right about the other two, that the inter predominates on the other two, because he would have to overcome all of that inter on this portion.

The relation of passenger miles was, 1910, intra 18 to inter 14; 1911, intrastate 19 to inter 13; 1912, intra 20 to inter 11. All our local excursion business is on the division, Marquette to Houghton. We have to use the Houghton Division to overcome the interstate business. The Houghton Division is heaviest in both inter and intra traffic; the mileage is: Houghton Division, 95 miles including Republic Branch 112.5; Western Division, 101.5 miles; Mackinaw Division, 197.9 miles. The south track, Marquette to Negaunee, ought to go in Houghton Division.

I have stated the Houghton Division to be heaviest in both inter and intra business, taking the year through; next to the
610 Houghton Division, the Mackinaw Division, east of Marquette, is the heaviest in interstate traffic; the Mackinaw Division also comes second to the Houghton Division in intrastate traffic; that is much heavier than the Western Division.

In my opinion, train 7 handles more interstate than intrastate business, comparing it with the rest of the trains. On 7 and 8, the inter business is also heaviest, and that is based on the fact that the trains have very few stops and are run to cater to long-haul traffic.

When in my testimony I stated that a certain train was the average, or above or below, I meant there was an average income of $1.19 per train mile, and classified trains as falling below or above that amount in earnings.

When I stated that the intrastate business predominated on trains 7 and 8, I had in mind the volume of business during the summer months, out of the Soo, but other considerations lead me to assume that the bigger portion is interstate business. An exact determination could not be made. There are now three lines between Eagle Mills and Negaunee.

(Defts.' Ex. No. 5, Maney, being method of division of rates between participating companies, introduced by plaintiff.)

MANEY.

Redirect examination.

By Mr. Butler:

My testimony as to the relative amount of interstate and intrastate business on trains was based upon general familiarity
611 with movement of traffic; I have no figures, calculations or accounts to support it; this is also true as to the comparisons made with regard to the relative density of the traffic of different characters on different divisions. I have nothing to do with operation, and there is no reason why I should be more familiar with the tracks operated than any person occasionally over the road.

MANEY.

Recross-examination.

By Mr. Wykes:

July and December or January and July would be fair months for determining the density of traffic.

612 On February 19, 1913.

CHESTER J. MCPHERSON, a witness called by Plaintiff.

Direct examination.

By Mr. Butler:

I have spent upwards of 30 years in operating department of railroad service. I entered railway service as Telegraph operator at 16 years; later was station agent, train dispatcher, chief clerk to superintendent; general yard master, chief dispatcher, chief clerk to general superintendent and master of transportation, with Terre Haute and Peoria, a part of Pennsylvania system. For 20 years I was with Illinois Central and Missouri Pacific; for past seven years as assistant to general manager of latter. I have given much attention to matters affecting cost of railway operation and expense incurred in different classes, and to railway economics, which necessitated inquiry of all lines of operation. For 20 years I have sought to get a check on railway efficiency, checking various units of operating department, by divisions; I have traveled all the lines of inquiry, seeking truth as to costs.

For Missouri Pacific I prepared formula for operating costs, seeking unit costs in all departments. I was a witness in Arkansas and Missouri rate cases, in which Missouri Pacific was involved, and, as representative of that company, I assisted in preparing the formula on which division between states was made. In both cases, the question of reasonableness of state-made freight and passenger rates was involved. I was also an expert witness in Minnesota Rate Case (for N. P. & G. N.), involving freight and passenger
613 rates, and in Chicago, Peoria & St. Louis case, recently decided, involving Illinois 2¢ passenger rate.

I have examined Complt.'s Exhibits Nos. 1 to 49 in this case. I have become familiar with operating conditions on South Shore, by going over all parts of the road in Michigan, except Republic branch.

I have examined exhibits in this case dividing expenses between states, and Michigan proportion between freight and passenger. Complt.'s Ex. 41 Delf (method of division of operating expenses between states, and Michigan proportion between passenger and freight), is the method generally used. Because of a simple situation, it is closer, as to amount allocated, than has been reached in other cases I have examined; one difference exists; e. g., some rail-

roads have used gross revenue basis to divide general expenses between states; whether that is any closer is a question in my mind.

The method of Complt.'s Ex. 41, Delf, is very close to, and does not differ materially from, that followed in any other case, where same issues are involved. Portions of three maintenance of way expense items, roadway tools and supplies, stationery and printing, and other expenses, not allocated between states, are occasionally divided on track mileage basis, the amounts represented being small.

In instances in which track mileage basis is used for division of unallocated expense items between states, I know of no
614 other basis or factors that would as nearly reach the truth, and that is a fair and proper basis.

(Witness approves division of 96% maintenance of telegraph and telephone lines between states on total miles of wire in each state.) (He also approves various divisions of unallocated expense items between states upon basis of Complt.'s Ex. 41, Delf, as follows:)

Maintenance of equipment:

Superintendence.
Steam Locomotives—Repairs.
Steam Locomotives—Depreciation.
(Divided on revenue locomotive mile basis. A division might be made on train miles, which would be relatively the same.)
Passenger Train Cars—Repairs.
Passenger Train Cars—Depreciation.
(On basis of passenger car miles.)
Freight Train Cars—Repairs.
Freight Train Cars—Renewals.
Freight Train Cars—Depreciation.
(On freight car mileage.)
Shop Machinery & Tools.
(On basis of revenue train miles.)
Each State Charged with Injuries Occurring therein.
Stationery and Printing.
(On basis of Revenue Train Miles.)

Traffic expenses:

Superintendence.
Outside Agencies.
(Allocated between passenger and freight, and divided between states on appropriate train mileage.)
Advertising.
Traffic Associations.
(Separate freight and passenger items on appropriate train mileage, and joint items on revenue train mileage basis.)
615 Fast Freight Lines.
(On freight train miles.)
Stationery & Printing.
(Separate items on appropriate train mileage, and joint items on revenue train mileage basis.)

Transportation expenses:

Superintendence.
(On revenue train mileage.)
Dispatching Trains.
(On revenue train mileage basis.)
In dispatching trains the train is the thing dispatched; this is whether the passengers be 1 or 100; the train is the unit.
There would be the same amount of work to dispatch a train as a locomotive.
Weighing and Car Service.
(On freight train miles.)
Station Supplies and Expenses.
(On ratio of station employes' account.)
Road Enginemen.
Enginehouse Expenses.
(On locomotive miles.)
Fuel for Locomotives.
(On locomotive miles of each class of service.)
Water for Road Locomotives.
Lubricants for Road Locomotives.
Other Supplies for Road Locomotives.
(On ratio of fuel for road locomotives.)
Road Trainmen.
Train Supplies and Expenses.
(On basis of revenue train mileage.)
Stationery and Printing.
Other Expenses.
(On basis of revenue train mileage.)
Loss and Damage—Freight.
(Freight train basis.)

616 General expenses:

Principally divided on revenue train mileage basis.
Insurance and Equipment.
(On basis of mileage of each class of equipment.)

Referring to Complt.'s Ex. 41, Delf, division between passenger and freight I approve the use of revenue train mile basis for dividing common or unallocated items of expense between the passenger and freight services, giving as reasons:

(*a*) That there is no other basis I consider of value, after much thought and having tested it, or that could be used, and arrive at anywhere near a correct division.

(*b*) Apart from the fact that much of the expense of maintenance of way and structure does not occur from use, the expense due to use arises from train miles in freight and passenger service.

(*c*) The train miles are the causes for the expense of use; the track must be maintained to a standard that will give efficiency and service, both freight and passenger, and for that reason the division would naturally follow the use or cause of the expenses.

(*d*) All there is to a railroad, after all, is the operation of its trains; it all simmers down to train operation; that is all that brings in revenue.

(*e*) I believe it the proper and only factor for maintenance of way and unallocated expense in maintenance of equipment and traffic.

617 (*f*) This brings up question of relative cost of passenger and freight train mile; it is true that they are different; the passenger train mile is made at an authorized speed of double the freight train speed.

D. S. S. & A. time table No. 299, Western Division, effective Jan. 5, 1913, prescribes maximum speed of freight trains as 3 minutes per mile and passenger 1¾ minutes per mile, running time, taking water, irregular stops, etc., not included. Houghton Division time table No. 228 (Complt.'s Ex. 63), effective Jan. 5, 1913, maximum speed of freight train, 3 minutes per mile; passenger, 1.5 minutes per mile. Mackinaw Division time table 221, effective June 30, 1912, maximum speed of freight trains, 3 minutes per mile; passenger, 1.5 minutes per mile.

Considering only that passenger train miles are made at higher speed than freight train miles, with a heavier train, there would be such a difference that one would hesitate to use train miles as a factor in dividing common expenses, but, to one acquainted with practical operation, it is possible to go further than those two factors, and see whether one service imposes limitation on the other, and whether those are sufficient of themselves to equalize practically the expense of the two classes of train miles, as the best factor for dividing expenses that cannot be definitely ascertained; the division would not be exact, but it would be nearer the truth than any other I know of.

618 Construction and maintenance must be such as to meet the maximum service; there is much curvature on nearly every railroad, which must provide an elevation for the maximum speed of trains, and a little wider *guage* to prevent binding and overcome centrifugal force. This imposes a limitation on the freight trains which would not require that elevation with a maximum speed of 20 miles an hour; the result is greater wear of freight trains on the track, an element to be considered in equalizing between the two classes of miles.

The passenger train service is preferred; the freight train must take the side track. This causes an expense imposed upon freight service by passenger service, both of transportation and maintenance; the freight train takes the side track to meet and to let passenger trains in the same direction pass it; it must stop, the switch be opened, and pull ahead on to the track, and stop again. After the passenger train has passed the freight pulls out of the sidetrack slowly, to allow the trainmen to set the switch and get on the train; so that causes two stops and starts to that train, which are an element of expense.

In maintenance of way expense, there is the wear on switch points and frogs, due to use by freight trains, but necessitated by passenger trains. While the train is on the side track 25, 30 or 50 minutes, it

has been using coal, water and other supplies, which, while charged to freight, is due to passenger train.

619 The only element of a train exerting tractive force is the locomotive, and the larger wear of tracks on a tangent is caused by locomotive. On curves, more or less wear is due to car wheels, due to the fact that guage is wider and outer rail is elevated. Freight trains have greatest number of wheels to cause wear on such curves, but that is incident of passenger trains, freight trains don't require the refinement of track to meet high speed service, but must take the consequences of it, which makes their wear and tear greater than if the railroad were built expressly for freight service.

This basis does not reach the division of expense exactly; railway companies, for their own purposes, have adopted the factor of train miles to test their own efficiency of operation; if there were a better unit, they would use it.

A large part of maintenance cost is due to other causes than use; what would divide the cost we know is incident to the train should be employed to divide cost that cannot be allocated to other causes. The reason is there is no way to measure it in units of operation, but it is an expense that must be paid; the best measure, in our judgment, for dividing expenses caused by trains would naturally be the basis to use for the entire.

(The witness gives items where repairs and renewals are not due to wear of train movement; of removal of sand, snow and ice, revenue train mile, basis charges as much to freight as to passen-

620 ger; if anything, passenger should bear more than is charged to it of bridges, trestles and culverts. Certain of the items are hardly affected by wear; so, also of telegraph and telephone lines. Stationery and printing would not be affected by train service; of ties, wooden bridge stringers etc., expenses are due to both causes. The extent of increased wear by freight trains, due to refinement of construction and adjustment in track necessary for passenger service, cannot be reached with certainty.

My idea is that expenses incident to stopping and delaying freight trains are properly chargeable to passenger business. I have made a study of time table and operating sheet of South Shore, to make a chart illustrating the necessity of such stops on that road if the trains moved on schedule, and have participated in making such a chart. The chart (Complt.'s Ex. 62, McPherson) is for Houghton Division, and shows both the normal movement per schedule and the actual movement, or time such train passed a station; I used time table previously referred to (Complt.'s Ex. 63) to take effect Jan. 5, 1913; the time table shows the movement of trains as planned for comparison of the movements as they appear to have occurred by the train sheet (Complt.'s Ex. 61 McPherson).

In operation of passenger trains, a greater length of track is reserved for their exclusive use than for a freight train moving in same direction, as a passenger train runs twice as fast. This means a passenger train must be given between 25 to 30 miles use of

621 track; anything less gives a chance for interference to delay passenger trains. They move a freight train just as far as

they safely can against a passenger train and enable it to get on a side track out of the way. I don't mean freight trains are to be 30 miles out of the way of passenger trains, but I say that, if they are coming together, that is the amount of track behind the passenger not being used and between it and the freight not being used. The passenger train, having run so much faster than the freight train, has left a considerable distance between the last freight and itself. The freight train would have only what she could accomplish and keep off the passenger train's time, or was helped by the train dispatcher; I don't believe I could express that in actual figures; this testimony all refers to single track operation.

The passenger train service is preferred, having first call on the railroad organization: I have heard men of experience and good judgment express the opinion that passenger business on any single track railroad is a losing business.

The company's material *of* freight is carried almost wholly on freight trains, the expense of which is in freight account. On certain railroads, investigation indicated that one and one-half to two tons per car, or about 2% to 2.5% of the freight ton miles, are company freight. The percentage would vary on different roads, due to the tonnage of revenue freight traffic, and the need for material and fuel; it would be a substantial item, but I know nothing of local
622 conditions on D. S. S. & A. Other things being equal, the smaller the amount of revenue business, the higher the percentage, to revenue, of the company's freight would be.

My answers as to the propriety of the revenue train mile basis of division of expense was intended to cover its use wherever employed in Complt.'s Ex. 41 Delf; I believe it the best, and, while not perfect, the only largely reflective basis.

I also approve other bases for the division of certain items between freight and passenger, as used in Complt.'s Ex. 41 Delf, as follows:

Maintenance of equipment:

Superintendence.
(On Michigan revenue locomotive miles.)
Station Employes.
(On revenue train miles.)
Station Supplies and Expenses.
(On ration of station employes.)

Transportation expenses:

Yard Expenses (12 items).
(Divided 10% to passenger and 90% to freight; this is largely a local question, requiring observation of the work done by switch engines; all roads make that division in an arbitrary way; the percentage arrived at by observation of the operating and accounting man; I have no familiarity with South Shore situation, but approve the method.)

Water for Road Locomotives.
Lubricants for Road Locomotives.
Other Supplies for Road Locomotives.
(On same basis as fuel for Road Locomotives which is allocated between passenger and freight.)

623 These divisions between freight and passenger, through use of revenue train mileage, are not a matter of accounts, nor kept by the railroad as accounts. It would be impossible for the railroad to make a division in its books between freight and passenger; there is no necessity in the railroad's operation to do that, so we must go to a matter of statistics for which this division has been used many years.

The Interstate Commerce Commission before 1894 demanded such a division on an arbitrary basis. That was wrong, it could not be done on that kind of a basis, because the question was one of determination on different bases; that was abandoned 20 years ago.

So far as I know, the division by railroads is substantially as given here; in fact, it was adopted by both sides, with no contention, in the Missouri Rate Case; there, the source of contention was between interstate and intrastate in freight and passenger.

Substantially, the train mile basis was used as indicated in Complt.'s Ex. 41, without enough variation among all the railroads to be material. Among operating men, there is a concensus of opinion that the factor for the division between freight and passenger as here used is the best known factor. Complt.'s Ex. 61, 62 and 63, McPherson, introduced.)

624 I do not intend to indicate by Complt.'s Ex. 61 McPherson or claim, that all the delay indicated by the chart was made necessary by meeting freight trains; there are a good many that are due to the passenger trains, and a good many that are uncertain. There are a good many of these delays by freight trains that a man, reading the chart and familiar with train operations, is certain are caused by waiting for passenger trains, but he would not want to testify to it as an actual fact.

A man who has been a train dispatcher, looking over Complt.'s Ex. 62, would come pretty near figuring out the delay caused by waiting for passenger trains, but could not tell how much of it was due to the waiting and how much due to station work, without examining the train sheet and seeing that the train had its maximum number of cars and had no work to do at that station.

(Complt.'s Ex. 43, Delf.) The Michigan passenger operating expense will be divided between interstate and intrastate on the basis of the earnings of each, with an addition to the intrastate business, to represent the greater cost of handling intrastate passenger over the interstate; this is the revenue basis equated. There is a sufficient data on Complt.'s Ex. 43, Delf, on which to base an opinion, and I have formed one—that it costs approximately a minimum of 25% more to produce an intrastate passenger mile than an interstate passenger mile. This opinion is based upon the following:

(*a*) Average journey of intrastate passenger, 1910, was 31 plus miles, while, for interstate it was 143 plus miles.

625 (*b*) Substantially 4.5 different people, on the average, travel over the line in Michigan to produce the same number of intrastate miles as one passenger in Michigan 143 miles.

(*c*) This means a greater use of terminal facilities by intrastate passengers.

(*d*) Intrastate passengers both board and leave the trains in the state, and, in the ratio of 4½ to 1, there would be a ratio in use of terminals of 10 to 1.

The excessive use of terminals requires additional selling of tickets, loading, unloading, checking and putting baggage on and off trains, use of terminal facilities, etc., terminal facilities means, at each station, wages of employees, maintenance of stations and platforms, cleaning, heating, lighting, supplies, ice and water, etc., which make up a large part of the expense of passenger operation.

The number of persons travelling were, in 1910, intrastate 488,745, or 85% and interstate, 100,748, or 15%. Doubling terminals for intrastate makes intrastate 92% and interstate 8%, which indicates the actual physical use of terminals.

Table by Delf (Complt.'s Ex. 64, McPherson), shows interstate and intrastate tickets sold for the year ending June 30, 1912.

This shows, for local tickets sold in Michigan, 98% intrastate; for coupon tickets, 75% intrastate; combined local and coupon tickets sold, 94% intrastate.

626 Each intrastate passenger would use terminal twice and interstate passenger once, making relation of 92 intrastate to 8 interstate, or 11 to 1.

Table by Delf (Complt.'s Ex. 65, McPherson), of ticket sales for year 1911 shows, for local tickets sold in Michigan, intrastate 98%, coupon intrastate 75.5%, local and coupon combined 94% intrastate.

Risk of injury in boarding and leaving trains would be 92% intrastate and 8% interstate for 1910, and risk of train accidents 85% intrastate to 15% interstate (the latter obviously wrong and later corrected, and still wrong.)

The risk of train accidents would probably depend upon distance traveled, and be as 4 intrastate to 1 interstate.

I have examined annual reports of D. S. S. & A. to Railroad Commission of Michigan for 1910, 1911 and 1912; they show, for passenger trains:

Year.	Average cars per train.	Average passengers per car.	Average passengers per train mile.
1910	4.33	13	42
1911	4.42	13	43
1912	4.32	13	43

This shows three passenger cars per train on an average. The seating capacity of these cars (allowing 15 for cafe observation cars) would be 123 people, while only 42 used them, on the average, showing an additional car over the average use; this becomes necessary

627 to provide accommodations for maximum number of passengers at any point between terminals. On account of uncertainty of short haul business, 25% of the expense of that train is due to provision for intrastate business; that would not apply to interstate.

I do not say it would apply to entire cost, as no more train employees would be required; there should be assigned to it 25% of the haulage cost and 25% of the cost of maintenance of equipment of the train and depreciation, and of the maintenance of way assigned to that train as between the cars. It would be hard to give an exact figure for it, or to estimate, as it is not possible to separate the costs common to all the cars of the train. There is no known way of keeping the cost of interstate passenger business separate from the cost of other business, by accounting; the assignment of costs between interstate and intrastate is, at best, an approximation.

But there is a certain amount of synthesis in it, because of factors greater in one case than the other, as (*a*) length of haul, (*b*) additional equipment, and (*c*) greater number of stops for intrastate passenger than for interstate.

Train No.	Route.	Mileage of route.	No. of stops.	Average miles between stops.
1	Houghton to St. Ignace	245	59	4.17
2	St. Ignace to Houghton	"	57	4.31
3	Marquette to Houghton	94.5	17	5.56
4	Houghton to Marquette	"	18	5.25
5	Nestoria to Duluth	109	32	3.09
6	Duluth to Nestoria	"	32	3.09
7	Duluth to Soo	302	22	3.75
8	Soo to Duluth	"	21	14.41

This is mileage in Michigan and this train is interstate carrying also local business.

628 In some instances, the excess cost would be above 25%; in some it would go below; I take it that that would be the average. The average is at least 25%. I do not recall having used the word minimum before; if I did it was not intentional. In my judgment, the excess cost would not fall below that average. I think the cost due to stops of passenger trains at stations should be divided on the number of passengers; of course, each stop would take care of any number that wanted to get on or off. I should say that the ratio would be about ten intrastate to one interstate, taking the average length of haul. If the company were doing simply interstate business, the average stops required would be at 143 mile intervals; while doing intrastate in connection with it, they would stop every 31 miles. Both terminal expenses—taking and leaving trains—should be taken into consideration with intrastate passenger. (Complt.'s Ex. 44, Delf, freight statistics) Leaving out of consideration the ore business, the elements upon which an opinion of the relative cost per ton mile of the intrastate and interstate freight business in Michigan, in each class, must be formed in this case, in the absence of division of less

than car loads, would be the length of haul. The intrastate freight business moved an average distance of 62.35 miles, while the interstate moved an average of 108.28 miles; there was a greater cost in producing a ton mile of intrastate than of interstate freight, due to the greater use of terminals and equipment; two terminals are attached to intrastate and one to interstate business, as a general
629 proposition—108.28 miles with one terminal expense, as against 62.35 miles with two terminal expenses required for intrastate business; two cars as against one car for interstate business. It is axiomatic that the cost per mile, as applied to ton miles, decreases as the length of haul increases. This is on both carload business and less than carload business; two cars being required for the same amount of intrastate business would require double the capital, the depreciation, switching and station employe service of billing, abstracting and handling accounts.

The basis for the conclusion that two cars are necessary for intrastate business to one for interstate is purely on the length of haul; interstate haul averages 108.28 miles; intrastate averages 62.35 miles. After you have gone to the expense of making your 62.35 mile shipment, before you have attained the same number of ton miles, it would be necessary to make another interstate shipment of 46 miles, and each shipment would have a terminal at each end.

Shippers are allowed to use the cars at either end of the shipment for 48 hours; to produce 108.28 miles, therefore, in the intrastate business, eight days have been lost in the use of the car, in time consumed in transporting it between the points, as against two days' use lost for interstate shipment in Michigan; the relation is four to one in the investment in and use and depreciation of, cars.

As to switching, there would be six switching movements in Michi-
gan in the intrastate shipment and one in interstate; the
630 hauling of the cars, if tonnage were equal and class the same, would be of equal expense, per ton per mile, in interstate and intrastate; I should say that it cost twice as much per ton mile, on an average, in the intrastate business as it does in the interstate business; I apply that to all stationary and rolling expense attached to transportation.

Applying to the total expense, including general expenses, based upon the rate per ton mile, it would cost double the amount to produce the intrastate ton mile over the interstate, embracing all expenses that would attach to freight cost.

The General Managers Association has made a tabulation of the gross earnings made by freight cars per day throughout the country; it is in excess of $3 per car per day, while the company gets $1 for demurrage. The illustrations given indicating extra cost of intrastate over interstate business, are confined entirely to carload business.

The less than carload business is the most expensive business that a railroad company handles. In cost of less than car load freight, as between state and interstate, the average haul enters as a very important factor, due to light loading of cars; there is always a much larger average haul on interstate than on intrastate, and the use of

the equipment would multiply in relation to length of haul; if the haul were 100 miles interstate and 25 miles intrastate, there would be four times the use of equipment to make the intrastate ton miles that there would be in the interstate ton miles.

631 In the matter of cars, the same relation would exist, as explained in the carload freight. Generally speaking, the cost of handling intrastate L. C. L. business is at least five times as great as intrastate. I put the maximum as five times as great, it may be eight times; the more I analyze this question the more I have become confident that our opinions have been too low on this extra cost.

McPherson.

Cross-examination.

By Mr. Wykes:

I assume the L. C. L. business was equally divided as between intrastate and interstate; in the figures given, no division between carload and less than carload was given. I took the entire tonnage on the assumption that there was an equality between the L. C. L., and assumed in my answer, based on the length of haul, that the carload business alone was two intrastate to one interstate.

There was nothing whatever from which I could separate the amount of carload and L. C. L. business; my percentages would apply with regard to conditions as they actually existed (for that cannot be separated), unless it developed that there was a greater difference in the length of haul between less than carload that there was between the total. I have assumed the same length of haul in both cases. Where the freight is L. C. L., both classes would be carried in the same train, and probably in the same car; I am not prepared to say what the loading—the proportions—of interstate and

632 intrastate in any particular train or class of trains would be. With L. C. L. interstate and intrastate in the same train, a car of intrastate would be unloaded and peddled out as you went along, while the interstate would probably be retained in the car for another haul.

There is a possibility that a particular train might have interstate freight for all stations along the line. The car might go from Duluth to Marquette, containing interstate freight only to Marquette or stations west; when part of the interstate freight is unloaded, for the purpose of economy of operation intrastate freight might be loaded into the same car, that is, the car would be utilized as far as it could be.

The density of class freight is not as great as of carload freight; this is equalized more or less in the class rates, and for smaller freight there is a considerably higher rate than for carload shipments.

The rates fluctuate somewhat with the length of haul on less than carload business—the shorter the haul, the higher the rate, as will be observed from the distance tariff.

Q. And so, before you can determine whether there is a profit on

a particular class of business, you must compare the cost of hauling business, must you not?

A. You couldn't determine that, prehaps, individually, only in a general way, but, taking the class and the average length of haul, you wouldn't determine the exact cost, but you would determine a relative cost between that and the commodity.

633 Q. But even then, to determine it relatively by classes, involves, an examination of both sides, that is, the rate and the cost, or the revenue and the cost?

A. The exact cost cannot well be determined, we can only approximate that, that is a matter of judgment. The unit cost of carrying freight on a railroad cannot be reached; we can get an average cost per ton per mile by reducing it to ton miles and then applying observation of the work or efforts necessary, the way it is handled, the bulk, etc., by an addition to the ton mile, would be able to reach somewhere near an approximation, possibly. We tried to do that, but it is not exact.

Q. So I understand you to say that it is not possible to get at exact costs for particular commodities or particular shipments?

A. No.

Q. Nor is it possible to get at exact costs for particular classes, even there it is an approximation, but when you have approximated the cost for a particular class, to find out whether that particular business is profitable, you must compare the revenue from that particular business with the cost for that particular business, as you reached it by approximation, is that true or not?

A. That would, of course, be necessary, to bring in the revenue, to determine whether or not it was profitable, but the labor of

634 ascertaining the cost of any one class compared with another class, by investigation, would be prohibitive, and after you had secured it in one instance, you might find a different condition that you would vary that very much.

Q. When I spoke latterly of the class, I meant the class as between inter and intra, and even there you must reach it by methods of approximation?

A. Certainly, you must reach it by those elements I spoke of this morning, that is, the length of haul.

Q. And the more familiar you are with the operation, the character of the traffic and the particular difficulties the railroad has to contend with, the closer you may get your approximation?

A. The more you are familiar with those conditions, yes.

My idea was that the car costing $900, with annual maintenance of $65, would earn $3 per day gross, on an average; the $1 demurrage is not compensatory. The $3 is determined by dividing freight revenue by the number of cars.

My cost of two to one in intrastate over interstate was based on two terminals for intra and one for inter and on the relative length of haul, there would be four terminals for the same length of haul on the intra and one on the inter.

There might be exceptions to that general rule; I gave no weight to, and did not take into consideration, the exceptions, their volume,

or what they were, because even if a car is handled twice, it would be rarely the case that the second terminal on an interstate shipment would equal either one, the originating and the destination
635 terminal, there might be some expense attending an intermediate station. I am basing it on the general proposition that an interstate shipment has but one terminal within the state.

To equal the 108.28 mile haulage of interstate in the intrastate, there would be one shipment of 62.35 miles and another of 46 miles, each involving two terminals; the 46 miles would be necessary to reach the average length of interstate haul.

The character of the terminal—whether at the Soo or at Nestoria—and the cost of the terminal would make no difference in the actual cost of handling the car through them; the process of handling the car at the Soo is precisely the process of handling at Nestoria, so the cost might be very closely the same in the two cases.

The value of the property on which the work was done might be greater and undoubtedly would be greater, at the Soo than at Nestoria; the value of the use of the terminal would not be any greater, because we get the same service out of each, the use, as measured by expenses, would be exactly the same. If you were going to determine the value of the use, you would have to go into revenue; you could not determine the value of the use by your expense, you would not get a solution to your problem of value.

If you were fixing a rental for these two terminals, the rental at the Soo would be much larger than at Nestoria, because you were
636 dealing in values; I didn't make any examination to determine what proportion of the interstate business has more than one terminal in Michigan, that would be a local condition.

I can imagine intrastate shipments on which there would be only one terminal; I made no examination to determine the volume of interstate business having two terminals; that would be exceptional, though it might be true. As against interstate business having two terminals, there is much interstate business with no terminal expense in Michigan, e. g., business from Copper County on Copper Range and Mineral Range, beyond Houghton, to Chicago, by C. & N. W., there would be no terminal expense attending that. Terminal expense for those shipments would appear in accounts of Mineral Range, Copper Range and C. & N. W.

The basic consideration of difference between cost in intrastate and interstate freight business is the length of haul, involving the greater use of terminals and cars and greater amount of switching; the switching item in freight business is a very large item of cost. The switching cars into and out of industries may involve distances of miles, which would be additioual cost; distance would cut little figure in the natural breaking up of cars—in yard work.

My testimony throughout was exclusive of the ore business, and I don't intend to embrace that in any of my figures.

637 In passenger business, I made no investigation to determine amount of interstate business having two terminals in Michigan, but testified on the assumption that interstate business had one and intra-state two, here, also, you have your trans-state passenger

business with no terminal on South Shore—Passengers from Calumet to Chicago, or from Canada to Duluth, would have no terminal service on South Shore.

Q. Would that be true if they transferred at the Soo station; would you say there wouldn'- be a terminal charge?

A. There might not be a full terminal service; that is, the agent wouldn't be called on to sell tickets or to check the baggage; a man might have bought his ticket in Toronto or Montreal, Canada, and his baggage would be checked through to his destination, but there would be the physical necessity of handling his baggage,

Q. And also transferring him and getting the car ready to put him at that terminal?

A. Yes, providing the facilities for transporting him.

The Master: You wouldn't call a change of cars at a transfer a terminal service?

A. Well, I don't know, you might denominate it as a terminal service, it probably would be as much a terminal service as a man alighting from a train and having his baggage put off, except that there would be a difference in accounting, expense, there would be no
638 accounting expense at all at the Soo, while there would be an accounting expense with a passenger alighting with his baggage at his destination.

The percentage of passengers checking baggage is comparatively small, and depends a good deal on the season of the year. I have found that the greatest checking of baggage has been in the intrastate as a rule. Traveling men carry baggage, having it checked from station to station; the number of terminal services they get is enormous—short distances. I have made no investigation to determine the ratio on South Shore; I simply assumed commercial conditions did not vary much in different parts of the country.

As between the interstate passengers themselves, there would probably be a bigger proportion than of intrastate who would have baggage, but the intrastate passengers are so dominating in number that when a few of them check baggage it is still of greater quantity. On the proportion of passengers, the intrastate would run less than the interstate on the basis of passenger miles, it might work out that there was a larger proportion of interstate; i. e., the distance hauled, as represented by miles, might be greater in the interstate business, but the baggage would not have as many terminal services. There is a possibility, of interstate and intrastate passengers for each station; I presume you could find stations on every railroad in the country at which there would not be an interstate passenger in a year. If they are going to go on a long journey, they
639 probably would make their arrangements to go to some large town where they would get full information and start the journey from there, and even then there are relatively few people that make interstate journeys in proportion to the intrastate.

With everybody, an interstate journey a few years ago was an undertaking; today, it is rendered comparatively easy by the conveniences afforded by the railroads, and still there are stations that I know *if*, on the roads with which I have been connected, where,

during my connection with them and intimate acquaintance with the villages, there probably wasn't an interstate journey made; they had cities of good size in the state, and that is where they visited.

It costs no more to stop to let off ten passengers than one, except the length of time necessary to unload extra people.

In reaching additional cost for intrastate passenger, there are some items of additional cost not amounting to 25%, and others which I am satisfied amount to many times that. Viewed ralatively, if a train stopped for ten passengers, nine of whom were intrastate and one interstate, 90% of the cott of that stop is properly chargeable against the intrastate business; I don't say that it would actually increase the expense though.

If we were going to refine the question by close analysis, the relation in that cost would be nine to one.

640 Now, so far as the railroad company is concerned, it is not a penny either way in difference in the cost of the stop, but if the cost of the stop, say, instead of a dollar, probably would amount to two or three, and you are going to analyze that, the division of it as between state and interstate, why, it would be in proportion to the number of people accom-odated. The intrastate would get nine times the benefit of the interstate.

The primary difference in cost in the freight department is dependent upon the length of haul; this is also true in the passenger department, bringing about the conditions I have enumerated. There are other very important elements. The greater number of passengers traveling in one service than in the other produces a cost of more cars to handle, greater use of station platforms, waiting rooms, facilities and expense of hauling, lighting, cleaning, supplies and employees; the figures show 85% intrastate and 15% interstate using the stations, and the number buying tickets from the agent, 94% intra and 6% inter; the other interstate passengers represented people who came on to the line with tickets purchased elsewhere.

At a one man station, it would be necessary to have the agent there for either class of passengers; but, if it were not for the local passenger, you might not need any, because of the interstate travel not being so general; every station has intrastate travel, but few of them have interstate passengers, and others only on rare occasions. If you only had interstate passengers, you would have far fewer stations

641 and the necessity for less property. If there were the same number of people and the same length of haul in each class, the only question would be as one terminal to two.

The reason the ticket sales, shown on Complt.'s Exhibits 64 and 65 are not nearer to the aggregate of the number of passengers carried, is the cash fares and mileage.

In my excess cost of 25%, I regard the possibility to exposure to accident as of the greatest importance, that, even on the South Shore, may sometimes cost as much as all your fuel costs in a year; it is among the possibilities—among the risks you take. I divided that into two kinds, possibility of accident in loading and unloading and of train accidents in transportation, the latter being ten intra and one interstate. This was due to dealing with the average length of

haul; a passenger always is exposed to accident. Every man around railroads is exposed; e. g., an engine might explode.

Q. Another one takes his place, and he is subject to accident for the 31 miles that he travels, but he is substituted for the other man, another one takes it for 31 miles, and he is subject to accident for the time that he is on the train, so, instead of being ten to one, isn't it in the exact ratio that the number of miles in the intra bears to the number of miles in the inter?

A. No, I used this illustration merely to show that it took four and a half passengers to make the length of haul of one interstate passenger, but that did not mean that there was only one inter-
642 state passenger and one intrastate passenger on there at a time. You have got 40 or 50, whatever the relation of the travel is on that train. We are dealing with that average merely to be fair, and not put it on the basis of the 85% intrastate and 15 interstate, we are putting it on the average length of the haul, as the lowest possible way it could be, about four and a half to one, we will have say ten interstate passengers on that train at the time it is wrecked, now, then, you have in your intrastate passenger, relation of four and a half intrastate to one interstate passenger exposed to injury from the derailment or collision, or whatever the character of the accident may be.

Q. For a limited time, for 31 miles, you would have your 45 passengers exposed, but you would have your ten passengers exposed four times and a half as long, because they are on the train four times and a half as long?

A. But the relation is the same, if you are going to get the same passenger miles. Passenger miles—I beg your pardon, if you are going to get your business, you can have as many times the people traveling that 31 miles as you have got passengers; you have got a relation of your passengers of 85% intrastate to 15% interstate, now, in numbers of people traveling, that is about six to one, isn't it? Your interstate passenger is exposed the whole 143 miles, but you have got the equivalent of that 143 miles exposed for every mile—in intrastate passengers for every mile that the interstate passenger is exposed.

643 That ten to one is based on the relation of the interstate haul to the intrastate haul, or, putting it the other way, the relation of the intrastate haul to the interstate haul, and that was an average. Now, in dealing with the actual condition of these intrastate trips, being made up of two, three, four and five miles, it wouldn't apply exactly to the exposure to accidents; if you were going to put it on that basis, it would be greater than four to one—it would be six to one, now, in the exposure to train accidents, I said four and a half to one, not ten to one, the ten to one was the exposure to accidents from boarding and leaving trains; the exposure to train accidents was four and a half to one.

The addition of an extra car, or 25% more equipment, to meet maximum requirement of intrastate business, would not increase all expenses in that ratio; it would the cost of car cleaning and switching, but there would be no extra employees.

The fuel cost should be equitably distributed between the load back of engine, the fuel cost would be a little more with another car added. There is no way I know of to measure the cost of this extra car, other than to divide the fuel cost equally between cars for weight behind engine. The maintenance for car wear on track would increase in the ratio of number of cars; that would be one-fourth the wear, naturally. The wear to rail by cars is slight in proportion to that of the engine. A knowledge of local conditions on South Shore might indicate additional extra costs for intrastate passenger business. My testimony applies to conditions common to all railroads. My
644 direct examination related to operating costs, except the requirement of a greater number of cars increasing the value of the property employed, upon which a return should be allowed, attributable to the freight business.

Other things being equal, density of traffic produces less cost per passenger and per passenger mile. There could not be such a difference of density, I imagine, in two parts of the road, as to materially affect the cost per passenger. As cars must be furnished to meet the maximum demand anywhere between terminals, a train might run over two divisions where the density would vary, but the train would not change the number of cars, and the expense would be relatively the same on that account. Where the trains over two divisions were separate, the density on one division over the other would not affect the cost per passenger mile, or per mile. You have a greater number of passenger miles in that train; you can spread that expense over the greater number of passengers. This 65,000 passenger miles per mile of road is the whole system.

The Master: What bearing does that have on this case, if it were more in some parts, and the cost per passenger mile were less in some parts of the road than in others?

Mr. Wykes: It has just this bearing. The places where the high cost due to scarcity of travel, exists on the South Shore are those places where the travel is more largely interstate; on the Nestoria Division, for example, where the interstate business is six times the intra, there are very few passengers, as compared with the Houghton
645 Division, for example, where the traffic is mostly of the other character, and I think it has a very great bearing on this case.

Mr. Butler: How?

Mr. Wykes: If the high cost per passenger exists on those lines that are almost exclusively devoted to interstate business, the answer is apparent how.

On the Houghton Division, there is probably a greater density of population.

Q. Then, getting back to the question of the use of property, there would be less property involved in carrying a passenger,—that is per passenger,—where the traffic was more dense, assuming values to be equal on two lines, would there not?

A. That is because there would be a greater average of passengers carried per car?

Q. Per car and per mile of line?

A. I don't know that that would be true. You would merely fill up your space that you already furnish and which is not employed, on the South Shore, according to these figures, there is room for 81 more passengers per train, on the average.

Q. Assuming that on one line those trains are nearly full, and on the other line they are nearly empty, in the one case there would be greater use of property per passenger, would there not, than in the other?

646 A. That is not necessarily self evident. That illustration I made was, and any answer to that question must come back to the proposition, that the railroad must furnish accomodations for the maximum requirements between the points between which the train runs; that would mean that the use of the property, if you base it on the number of passengers per train mile, might vary on the different parts of the line. You would use the same amount of property on the line, but you wouldn't utilize in some cases the entire potentiality of that property, and in the other you would, that is all. If now you run a train that is entirely full or the average of passengers in that train practically use the capacity of the train for carrying passengers, then you would use all of the property; that is the difference; you couldn't find a condition, probably on any railroad, where a train would have the same average passenger miles between each station all the way through, or, in other words, the average passenger mile would vary as people got on and off the train. Now, the average trains, of all the trains on the South Shore, is four and a third to four and a half cars; I couldn't say what number of cars were provided on the Houghton Division expecially as distinguished from the Western Division. It would be necessary, to answer that question, that I should know the car supply and something about the details of the travel, because I can imagine, and it is undoubtedly true, it must be an absolute certainty that the same number of passengers are not in the car between all stations between Houghton and

647 Marquette, the part of the road with the greatest density; the full capacity might be used out of Marquette, say to Ishpeming, or to Negaunee.

Q. Now, take the same proposition that you have been answering and, instead of applying it to passengers, apply it to passenger miles? Assume that there is less on one line than on the other passenger miles, then you have a greater use of property in the one case per passenger mile than you have in the other; that is self evident and that applies not only to the property in the train, but to the roadbed and everything else that is used in operating that train; that is self evident also isn't it?

A. Well, you have got to take this into consideration. You put the same amount of property in there, and you may vary the miles; you employ the same number of cars, but if you divide that now as to the use of property per passenger mile, you haven't changed the value of the property used, but if you say the value of property used per passenger mile, you have changed it; but, in the aggregate, the same value of property is used.

Q. Take those trains that you have mentioned that run 81 passengers light; that is, they would hold 81 more and seat them?

A. That is all of them, on an average, on the road.

Q. What additional costs would there be if those trains were full?

648 A. Well, there would be some additional terminal cost; there would be more tickets sold, the auditor would have to audit more tickets, and the treasurer would handle more money, which might involve employing more men. The make-up or consist of a passenger train don't differ on a railroad; it runs the same, year in and year out, unless there is something special going on at some of the towns that requires additional cars, such as fourth of July, or a baseball game, or local fair, or things of that sort, but the consist of the train is the same.

Q. The train costs wouldn't be increased, then, by increasing the number of passengers to the capacity of the trains now run?

A. Not in relation to the hauling cost, no; there might be some minor increase in expenses.

Q. A little more drinking water and a little more ice, and things of that kind, a little more wearing out on the seats and on the carpets, but only an increase in small items?

A. Well, you might have to increase your employees, probably would. You have to provide in every train to meet a number of people—in other words, you have got to be ready to serve any demand. A railroad would like to have it entirely full, and no margin. In this regular service, this regular consists of trains—that is, of cars that run from day to day, not changed,—it is based on experience that will be ready to *service* the public any day that it

649 makes a demand. It always is a little above the actual demand, because, to keep your passengers satisfied, you want to give them seats, and it ought to be done. I will put myself on record now, as a suburban traveler, that every passenger should have a seat. Now, in answering your question specifically, the consist of the passenger train being regular, the expense of handing the particular train over its run, whatever the length of the run may be, would be relatively the same; there would be some few, as I say, minor expenses due to there being more people, the maximum service being reached.

Q. If that is true, then, the fact that there may be a greater number of passengers in a particular department, an increase in one year over another in the intrastate department, the trains continuing normal and as before, should not draw to the intrastate expenses the full proportion that would be drawn by those passengers, if you consider them in comparison with the whole number? On Ex. 43, there were 18 million plus intra passenger miles and there were 14 million plus interstate passenger miles, in 1912, the intrastate passenger miles had increased approximately two million? They had increased approximately two million, to twenty. The interstate passenger miles had fallen off somewhat. Now, to carry the increased two million intrastate passenger miles did not involve the adding of their pro-

portion of the full cost of the service, because you were run-
650 ning your trains anyhow, that is true, isn't it?

A. That is probably true; it didn't increase the cost of the service—the relation—no.

Q. The total cost of running your train, of 2 to 18?

A. No, not the total cost of running your train.

Mr. Butler: That is, it wouldn't per se, it might from other conditions.

A. Yes, I mean it wouldn't, stated as you have stated it.

Q. Other things being equal, it would not?

A. No, all things being equal, that would mean that the passenger miles were the same and the conditions of operation the same.

Mr. Butler: And the haul the same?

A. The length of haul the same.

Q. Now, take on the other hand, assuming the trains were run solely for the interstate business, and the interstate passenger miles decreased from 14 million to 11 million; that would not decrease the train expense in the ratio that those figures bear to each other, would it?

A. Not if the conditions of train miles and all other things were equal.

Q. But if, instead of the trains of the South Shore running with 81 vacant sittings, on an average, they ran with 100 vacant seats, on an average?

A. You are not decreasing the cost at all, that cost is the same, as long as you remain on the ready to serve basis. Four and
651 a half passengers would have to travel 31 miles each to accomplish the same mileage as accomplished with one passenger in interstate; that would be on the relation of 9 to 1. There might and might not be train stops for these passengers in the relation of 9 to 1, or of 4½ to 1. There would be that many terminal expenses in one service as to the other. As to the train stopping, that might be somewhat different; it might be greater or less.

If only one passenger got off and on at a stop, it would work out on the same relation for stops. The local trains I took, stopped at practically every station, with some flag stops. I was on a purely local train, Bibon to Nestoria; the interstate passengers that were on from Bibon gradually thinned out, and people going to Marquette, Houghton, etc., began to get on. Trains 7 and 8 make stops in addition to those scheduled, generally, for passengers beyond the state line, west. I think I figured those in, in arriving at the number of stops; I am not sure. I naturally would have taken all of the probable stops. With mileage in Michigan of 143 miles, if all trains were interstate, there should be some difference between them in speed; this could be accomplished by a fewer number of stops, or by making it a faster train. In looking over the trains on South Shore I find very little difference in their speed; 7 and 8 accomplish the time between terminals at two miles per hour greater speed that the others. Assuming this road was doing only intrastate business, there should be some trains that would be run for the smaller towns,

and stop at all the stations, perhaps, and others which would afford means of communication between the places; that would de-
652 pend upon the demand. It is natural that provision should be made for a through service more quickly than a local service; a railroad measures that by public demand, as expressed in the travel.

Trains 7 and 8 answer at least two purposes, the rapid transportation between the larger cities, and for the interstate traffic as well; they carry a great many interstate passengers. Where the capacity of a train is measured by the greater volume of business between two stations, both the interstate passengers who are on it and the intra who travel between those points would contribute to making it full, and the relation in numbers is such that the spaces being used for short distances shows it is short journeys that makes that space necessary. As a general proposition in railway operation, you can figure closely how many cars you want each day for long hauls; with short haul passengers, that is very difficult; you must be ready to meet any emergency. For special occasions, such as a ball game, if the accom-odations provided would not take care of them, they would put on an extra car for that trip; they would not carry accom-odations throughout the year to answer the needs of extra travel for such purposes; but something comes up every day, somewhere on the line, they must be ready to serve.

I found three passenger carrying cars on the average train, some of them being cafe observation cars, with 15 seats, or a sleeper, ordinarily, you would have a smoker, one coach and cafe or dinning car, or a sleeper, and that, whether there would be 10 or 25 people to use it, and a parlor car, or cafe car, or diner, or sleeper.
653 I don't know as I would dispense with any of those cars if the traffic were lighter between some points on the South Shore. I think the cafe cars on 1 and 2 had a greater number of intrastate passengers; I could not say how it was in proportion to the number of passengers in each class. I didn't analyze that train closely, but formed conclusions as an incident of my journey.

Other things being equal, there would not be many of the passengers traveling 31 plus miles or less who would pay the extra fare for accom-odations in the chair car; you can get a pretty long haul on the South Shore as an intrastate passenger. There are a good many of the passengers at 31 miles or less to bring the average down to 31 plus. As a general proposition, the special service provided by the sleeper and parlor car would be more used by the person receiving the longer haul; it might be an intrastate haul. There is a good deal of high class travel between Marquette and Detroit and other cities in Michigan, which would use those accom-odations. The interstate travel alone would not support it. The South Shore runs a sleeper from St. Ignace to Houghton and return, probably for the intrastate passengers. The day I was on the train, we had a greater number of passengers between Houghton and Marquette on No. 1 than elsewhere on the line. On train 7, I went through the train to observe condition of operation, and that had considerably more from Marquette to Ishpeming than west of there; it would be natural

that travel would be heaviest between Marquette and Houghton.

654 Assuming the travel to be such as it was on the day I was on the train, I do not think I should have dispensed with any of those cars, you could not very well dispense with any but the observation car. I would not have cut off any of those cars after traveling over the road, if I were managing; it seems to accom-odate and please the people. The dining car and cafe car on South Shore is as good as on anybody's road; better railroads than this do not have any better dining car service; it compares favorably with those found on other roads, and no man from New York to California could complain of it.

In Minnesota Rate Case, my testimony was directed chiefly to freight; the conditions influencing excess cost of intrastate over interstate service might vary with different roads with a lot of branch lines. The extra cost would be higher for the road with the branch lines, and my impession is, that in Minnesota case I put it as high as 40%; I don't believe in any case it could run lower than 25%.

The day trains naturally carry more local traffic; as a general proposition, the night train would be preferred by interstate traffic; possibilities of long intrastate hauls are great on South Shore, because there will be considerable travel to Southern Michigan points.

I have, more or less, for 15 years, investigated to determine the exact cost of carrying passengers; I have worked it out, and then given it up, and tried it — every angle that could be worked. I gave it up because I did not get truthful results; anyway it could

655 be worked, it would come, after all, to so much depending upon observation, that could not be demonstrated mathematically, that you might use it to serve certain purposes of the railway, but, take it outside the railway sphere, and they would ask you to prove it. I am still at it, and have not solved the problem yet. It would vary according to conditions on the road, and results worked out for one road would not necessarily apply to another.

Even on the particular road that I am connected with, I am unable to get exact costs; I am not able to demonstrate it mathematically, but have them sufficient for use for statistical purposes—not sufficient to satisfy myself that I have got exact results. In discussing it with other men working toward the same end, you find that you have got where they have and there you are stuck; they have all got to the same basis, and you cannot get away from it.

I never made computations to determine the cost of terminals per passenger, or reached any mathematically correct results for that, because the impossibility of determining that definitely is obvious.

Q. And when you did get the cost, in the general way that you have stated, of carrying passengers, that was based on arbitrary premises throughout, was it not?

A. You might term it arbitrary, if you would say that anything that is not mathematically justified is arbitrary, but your result will be closer than anybody else could get who hadn't the experience to make deductions from their observation to consider in connection with their problem.

656 I should say that "estimated" would be a better word than "arbitrary." The division of costs calls for the application of judgment in the division of items from point to point, and would depend largely on the observation and experience of the man making the estimate. I am not testifying as to the unit cost of carrying passengers. Unit costs are very difficult; you might obtain a very few on a railroad, as compared with some other kind of business. When you divide the costs of a stop at which you deposit 10 passengers, nine of whom are intrastate and one interstate, on the basis of nine to one, that does not attribute the exact cost of each of the different classes; it would not be a problem that any man would undertake, except, perhaps, for a purpose like this. The cost would probably not be much more for depositing six than one, except as to some of the elements entering into it. In the nine passengers, there are nine exposures to risk of accident, intrastate to one interstate. The stoppage cost might be a little greater because it would consume a little more time.

Q. You would attribute the cost on the basis of nine to one, on your idea of that's being a fair method of separating that cost?

A. Yes, if you are going to divide that cost. I should say that the benefits are nine times to the intrastate to one interstate. The natural definitions of the word there would be if the benefit is conferred by a railroad it is all attended by cost.

657 In testifying to the use of the revenue train mile basis for division of common expenses, I testified that the additional speed in the passenger department would not, of itself, offset the extra weight in freight service; there are other elements which would come in. I limit my answer, that the revenue basis could be applied to the division of general expenses to the division between states.

I stated that the element of speed in passenger trains might not of itself overcome the greater weight and number of car wheels of the freight train, because it was a matter of uncertainty; one would not want to make a positive conclusion on any one particular element, or its importance as to the balance, or as to the whole. The weight and speed would have to be taken into consideration; also the limitations of the construction of the property for the passenger service, because to construct the property at the maximum, would increase cost of freight train operation.

If it was a question merely of weight or speed, all other things being equal, I would say that that, of itself, would not be sufficient; as to the effect of operating a heavier train at a low speed over a track constructed for high speed, I believe it would be a proper consideration to make one the equivalent of the other.

That element was the elevation of the outer rail on curves, and the broadening of the gauge, to meet the speed of the faster moving passenger trains, also the passenger train being

658 preferred, and the freight obliged to take the sidetrack in meeting and passing, wears switches and frogs.

I might have pointed out other elements to offset greater freight weights in my direct testimony that would have related to the grand account of maintenance of way and structures, but these are all I

can call to mind at present; those would appear in the maintenance of way account in rails, track material, ties, roadway and track and roadway stores and supplies. The ultimate strain of centrifugal force varies in proportion to the weight and motion. The engineers have a formula something like the square of velocity; I don't think there could be any doubt about the fact that centrifugal force would be greater with greater weight. The chart, (Complt.'s Ex. 63), indicating delay of freight trains due to passenger trains is for Houghton Division only. Conditions are not necessarily the same on all three divisions. The traffic is heavier on Houghton Division; I selected it because it was the shortest mileage, and I could get it done quickest. It is obvious that the greater the number of trains, the more meetings and the more delays. The meeting places are shown on the chart; these scheduled meetings are to get the passenger train by the freight train, and to get the freight train by the passenger train, on a single track.

It is requisite that a freight train pass the passenger train as much as that the passenger train pass the freight train; the only thing is that a freight train takes the sidetrack and waits for the
659 passenger train's arrival; the passenger trains do not have to wait. If you are running passenger trains 35 to 40 miles an hour, I would not take chances on less than 30 miles ahead of the passenger train; it would be different for a train running 22 to 24 miles an hour. On the time card, freight trains are scheduled closer than 30 miles an hour; that is a matter of arrangement. The 30 miles an hour refers to when the schedules are disarranged; the train dispatcher then takes charge, and handles the train and directs the meeting points. He would have to take into consideration the train on schedule to the extent that he must provide for safety.

Q. You- allowance of 30 miles is not an allowance for two trains on schedule, with a schedule meeting point, it is an allowance for a stray train, or a train running off schedule, as against either one on the schedule or another stray train, is it not?

A. So far as a regular orderly operation is concerned, by schedule it would be both before and behind the train, but in the disarranged schedule, it would of necessity be greater. I illustrated that in two passenger trains coming to a meeting point themselves, and there is a freight train in there; that freight train is bound to get a bad delay, unless it is exactly arranged and the actual schedule is carried out, because, if she gets into a sidetrack to allow one train to meet her, she cannot go any further perhaps in a thirty mile distance between those two passenger trains approaching each other, the dis-
660 tance 30 miles, and get anywhere else until the other train had met her, one had passed her, and the other had met her, or vice versa. In approaching each other, a schedule might be made 15 or 16 miles apart with a freight train, that a freight train could get a movement of some sort for a very short distance. You must consider the time necessary to stop the train, to permit the brakeman to get ahead and throw the switch, then for pulling in on a passing track, around something of a curve, all of which takes time.

The time varies, I have seen a heavy freight train take 10 min-

utes to get on to a passing track; they might be able to pull in in five or six; the average would be seven or eight minutes. Railroads require a freight train to be clear of the passenger train by at least five minutes. Under normal conditions, the locomotive, in getting a start and the use of the sand, would cause wear on the track; in bad weather, with dew or water on the rail, it might cause greater wear. It would not cause as much wear and damage to track as would be done on curves or on grades.

After the passenger train has passed, the freight train is free to operate, but, as passenger runs at double the speed of freight, it necessarily leaves an opening there; it is ready for the freight train to go on to it as soon as the passenger train has passed the limit by rules preventing freight trains leaving stations following passenger, which may be within five or ten minutes; it differs on different
661 roads and at different stations, due to topography of track.

There is some service performed by passenger trains for common operation of property; the baggage cars are utilized for moving material that requires quick movement, and for stores, supplies and stationery. Company employees will be transported on passenger trains, and passenger trains would carry company mail; that, so far as it goes, is an offset in service, but the freight train service is very expensive, because carrying much tonnage of company fuel.

The business carried on passenger trains would be comparable with that bearing high rates; it would be carried in the same cars with express, and handled often by the same joint messenger and baggageman, but the volume of company material handled on freight trains is very great, including freight, ties, ballast, rail, track material, timber, lumber etc. On the other hand, the number of persons carried free for service or exchange of service is quite large.

You don't have to furnish additional cars to carry stationery and company passengers, you have to furnish both cars and, sometimes, extra trains for bulk of company freight carried. I think the number of cars given passenger trains would run about the same throughout the year.

I think I testified in C. P. & St. L. case—the Illinois case—that revenue train mile basis was to be applied generally as to all expenses common to both, unallocated to either, without going into separate items; I made no figures for the purpose of that division.

662 My recollection is that, in the Arkansas Case, the division of common expenses between passenger and freight was substantially the same as Complt.'s Ex. 41. In Arkansas Case, we used a different formula for station employees, being an arbitrary division of 75% freight and 25% passenger on unallocated items, due to peculiar conditions.

The same basis for the division of common expense was used in Missouri Case as in Arkansas Case, we presented one basis, the State another, and the Judge divided on his basis; in Missouri, our basis was accepted by the State.

Both Missouri and Arkansas cases comprehended both passenger and freight rates.

In Arkansas and Missouri cases, we divided items which are comprehended on sheet 2 Complt.'s Ex. 41 Delf, on basis of 10% to passenger and 90% to freight, by using what we actually found to be the case, by making observations and determining it in hours devoted to the two classes of work; we reached a conclusion of 5% passenger and 95% freight for each state. Our yard arrangements were especially favorable, and, with rare exception, our switch engines were able to perform the freight and passenger duties.

There were a great many different terminals and different conditions comprehended in the system involved in both those rate cases, the Missouri Pacific, involving 1,400 to 1,500 miles and the Arkansas Case close to 1,400, not including second track. In Arkansas Case, the issues were tried for two railroads, and in
663 Missouri Case there were 18 different systems.

I would not want to testify positively that the ratio of 5 and 95 was used for all the railroads involved, but for our company it was taken from our own test for about a week. We still carry that figure on our operating sheets. I don't know why it should be different in this case; it would depend on local conditions.

Q. The freight train mile is not the relative or the equal of the passenger train mile, is it; they are not the same thing, in other words?

A. Of course, no man could testify that they were exact expense equivalents, but, in considering their direct expense and those that followed because of the limitations placed upon the freight trains, railroad men who have given the question consideration have generally agreed that that is the fairest factor to use, and they have used it for their own purposes. Railroad men might differ individually as to how they reach a conclusion, how much value they gave to these certain elements, but they get to the same place, they all get to the fact that it is the best unit that can be employed, it gets nearer the truth. Of course, if there was any better unit, they would be glad to get it.

Q. They don't all agree on that, do they?

A. They all agree on the general conclusion.

Q. That the revenue train miles basis is the best unit, is
664 that the concensus of opinion among accountants and engineers, in your judgment?

A. I won't say among accountants, I will say among operating men; you might find railroad accountants that might differ on that, because you can get up an argument on anything on a railroad, but I believe that accountants generally, and I know, practical railroad operating men, regard that as the closest unit to employ.

Q. There have been a great many accountants who have taken a different view of it, have they not, and a different view and method has been employed in the division of common expenses in cases other than these mentioned, but which you are in general familiar with?

A. Well, in the evolution of the railroad mind, pretty near every unit that is possible, or combination of units, has been employed, in an effort to get an exact result, and they have been discarded, as well as has the arbitrary division that the Interstate Commerce Commis-

sion first directed be made, they have all been discarded. Now, with the accountants, they have got a limited field for considering that question; the accountants can determine and allocate their expenses from their books; when they come to the matter of common expenses and where their book entries no longer prove to be a guide, their examination has got to stop, and they have got to consider items that cannot be a matter of accounting record. You must go in the field of cause and effect; you must consider further the practices of operation; and those are all matters that the accountant would have no opportunity to consider in the matter, and which are, after all the essentials.

665 He has no guide in his books; the common expenses must be determined on the basis of the known effects, which can only be learned by observation, experience, and the putting of all these things together. That is the reason I said a moment ago that railroad men might not agree in the detail, or the value of the various details, but they came to the same conclusion that the passenger and train mile were practically equivalents, or sufficiently so to be used as units, and give the closest determination of the expenses. Now, in making the efficiency sheets, I know of no road that don't employ that method of division; those efficiency sheets the management is testing itself, and is comparing itself, its efficiency with the efficiency with other railroads, the efficiency of the particular divisions, which of course, would reflect on the superintendence; it is tested in that way.

Q. But for those purposes relative costs are sufficient?

A. No, because one of the very first essentials, is to divide your passenger and freight expense; before you can take a step in the preparation of your operating sheets, you must determine that. Now, if there was any better unit in the mind of men upon which they are going to measure their own effort, they would very naturally adopt it.

Q. The dividing of these common expenses on the basis of revenue train mileage for statistical purposes, was used long before the necessity for its use in railroad rate cases came into existence?

666 A. Yes, sir, it was the standard.

In my mind, the doubt is whether the freight train mile is the equivalent of the passenger train mile—whether the passenger train mile is really most expensive. At a certain time of the year, in bad weather, while the freight train mile appears more expensive, it is because of passenger trains. I have known of an operation six weeks at a time when it was almost impossible to get a freight train over the road because all the activities of the organization were getting the passenger trains through.

Upon the question of whether the revenue train mile basis is fair for dividing costs that don't occur on the line where the mileage is made, but which occur on branches where one class of the service is not carried at all, a railroad won't go to the expense of creating any unnecessary facilities for its operation and any of those facilities for the common benefit of both classes of traffic; if it didn't have that track, whatever it is, that is used by the freight, that business would

have to be done on the main track. You either have to create a facility or do the business on your main track, in some manner.

Q. How does it relieve your main track, if you didn't build out five, six, seven or eight miles to get it, it wouldn't be there?

667 A. You have your railroad for the transportation of your passengers and freight, and you have your passing track, to enable those trains to be met and passed, and you have your house tracks and your freight house to enable you to handle the merchandise, and you have your public team tracks on which you can receive and deliver carload freight, and you have your tracks to the stock yards and then you have your tracks to industries; now, all those facilities are necessary to enable you to do business, and the business you get from their employment gives you your revenue, and business. The employment of any independent tracks for one kind of business or another is merely incidental, and not fundamental. The idea is that your revenue which goes to pay your whole operating expenses and your cost of operation, which is produced by those facilities, is the point of direct consideration in this question. You might as well say that you should eliminate your stock yard tracks and your house tracks and everything on a railroad except main track and the passing tracks.

Q. But those particular things, if you can find where the item of expense on their account is, you will locate it directly, won't you, to your freight?

A. That would be merely the first view of the question. The question is that these facilities are all necessary to enable your business to be done, and, as I said before, in the question of division between passenger and freight expenses, if you consider that on a narrow ground, you would say I will allocate these; when you do, what are you going to do with the revenue produced?

668 Q. So far as you can determine the income of those things absolutely as being of that character, you locate them in the freight side of your problem, don't you?

A. They appear in your freight earnings and in your passenger earnings. As I understand it, you have merely taken certain tracks which are used for freight business solely, and you say this should not be considered in your general division of your expenses. Why don't you on the same basis, eliminate all of your house tracks, and your stock yard tracks, and, as I said before, eliminate all tracks except those that are necessarily for those trains, to enable the conduct of train operation over the road, your passing tracks.

Q. The reason you don't do that is because you are not able to separate and allocate the costs of those things that lie along the main line; so far as you can locate them, you have done it before you have come to the question of what are common expenses, and you are getting at the basis of division of those things that are common after you have set aside those that you know belong to one class of the service or the other?

A. I see no more reason for eliminating any tracks that produce one kind of revenue from consideration here than all tracks that produce that same kind of revenue, and that would take in your yards,

in fact, there is no more justification to my mind, in eliminating any of those independent tracks; that is to say, tracks, just skin
669 the railroad down, undress it, if you please, down to the main track and the passing tracks; they are all necessary to its operation, and at times they might possibly be used; but the whole result comes down to this: In building your freight tracks for freight, you are increasing your freight tonnage, aren't you, and you are increasing your freight revenue? Now, when you get a total, because of the rates existing today, may be in just proportion to each other, but if you increase your freight, increase passenger, you are enabling the road to conduct the business of either without going into the hands of a receiver, or both, you might reduce the rates on one class of business below a living basis; still you might keep out of the hands of a receiver, if you were able to build into a lot of industries and get a whole lot of freight business.

Q. That is really a question of economics you are talking about now and not the question of getting at the division of costs of business. Now, you have stated that the building out of these spurs increases freight revenue?

A. Yes.

Q. If they are used solely for freight purposes, that freight revenue of that part of the business should bear its own expenses, shouldn't it?

A. Doesn't it reduce the cost of your passenger?

Q. Just answer my question, as to whether the freight business should bear its own expenses?

A. The freight business should bear its own expenses, but
670 where you come to a question of interjecting in there a property value to be deducted before you divide either your revenue or your operating expenses, it seems to me you are trying to solve a question on one or two of its factors, and not employ all of them.

Q. I am not trying to get the property value in.

A. As I understand it, it is the value of this track; here is an independent facility, you say the operating expenses of that independent facility should be charged to freight, is that it?

Q. Take, for example, the Republic branch, that the Master spoke about, and eliminate from it the consideration that one passenger train passes over it; assume that it is entirely engaged in freight service, and you can find, either exactly or arbitrarily the cost of operating over that line of eight miles, should that not be directly allocated to the freight service?

A. No. You have got your other side of this question to consider, as you increase your freight business, you are decreasing your passenger expense in common items.

Q. How?

A. Because you are making more freight revenue train miles to handle your increased freight business.

Q. Where are you making it, on the main line or on this spur?

A. You are making it as a whole, altogether.

671 Q. Making it on the spur, too, I assume?

A. I don't know, but my impression is that there is no revenue derived to a railroad from the spurs, that the rates at the junction of the spur with the main track are the same as from the end of the spur—the end more remote from the track. If your freight business increases, however you increase it, that causes you to make an increase in your freight train miles, you are reducing your passenger proportion of the cost.

Q. Let us admit that to be true for the moment. Assume the operation on this spur is entirely freight operation; there is no passenger operation at all; it costs money to operate it. Now, what business produces the cost? Is it the freight operation on that spur, or is it the passenger operation on some other part of the line?

A. There may be there, if it can be allocated a direct cost, that is apparently freight, but what is the effect of it; doesn't it help to decrease your passenger expenses?

Q. That may be true, but the freight operation produces the cost, doesn't it? I would like to have you answer that by yes or no, if you can.

A. I should say, directly, yes, assigned to that particular piece of track, but, as against that, you haven't any revenue from either department.

Q. Now, if we treat that as common expense, and divide it on the basis of the revenue train miles, a part of that expense goes into the passenger expense, does it not?

A. Yes.

672 Q. And that will be in the proportion that the revenue train miles in one department bears to those in the other, those costs or expenses that are due to maintenance that is caused by deterioration or age rather than wear, what relation have those to train movement?

A. The whole of the railroad, in all of its activities, is devoted to only one thing, that is the movement of trains, and anything incidental to that road that is necessary to keep up, regardless of how it was caused, bears its relation to the operation of the trains, because that is all the railroad was built for.

The wear by age goes on, whether you move any trains in passenger department or not, but the only activity of a railroad is its train operation. If next year you move only half as many trains on the South Shore in the passenger department, and the same number in the freight department, the same amount of deterioration, age and cost of maintenance due to that would exist, and, using the train mile basis as the basis, you would only draw half as much to the passenger department as in the previous year; or you could reverse conditions, and draw half as much to the freight department. You could make any proposition, and get a conclusion from it, but these are not conditions that would in any probability ever arise. Year by year, the relation of your passenger and freight train miles will be very close; there may be some special occasion that would change that relation.

The tendency is growing to larger locomotives and longer freight trains, which involves less freight train miles. The substi-

673 tution of different types of locomotives, that will draw three to five cars more in freight service, will materially affect the number of freight train miles. The heavier units make greater cost of maintenance; most of any of these railroads 20 or 25 years ago would not stand the traffic of today, 56 pound rail was once considered good track but today we want 80 to 100, which is occasioned by the weight of the units just referred to; the bridges are constructed to bear more than double the weight. The increase in the size of cars and locomotives creates a much greater expense in operation.

The primary purpose is to decrease costs, and even that result in handling freight business serves to decrease the cost of handling passenger business. There is not much difference between the weight of present day freight locomotives and the larger passenger locomotives. The number of cars drawn by a passenger train has not increased in the ratio with the number drawn by a freight train, as weights of those are considerably different. They began to use this revenue train mile basis a good many years ago.

I don't know that there is any increase in number of cars per train over a number of years ago, but there is in the number of tons per train. We don't use the number of cars in a train any more as representing freight statistics; it is disregarded, we deal altogether with gross and net tonnage, today, per train mile.

Referring to the question of whether I had made any investigation to determine what part of wear on curve is due to
674 elevation and what part is due to the fact that trucks of freight cars do not adjust themselves to the track as readily as passenger trucks, it is a fact that the freight truck is not calculated to meet that condition that the track is elevated for. It is not a matter of speed, the freight track answered the purpose for freight transportation. If there were no elevation, there might be some wear due to freight trains on curves, but it would not be so much. I never made any investigation to determine the proportion of wear due to restoration of the train line after passing the curve, where there was not any elevation, and due to elevation of the outside rail; that can only be observed in yards; on the line you have both elevation and curve. I attribute great wear on curves to the elevation of the outer rail.

There would be some elevation for a freight train speed, you know, and whatever wear was caused on a track that was adjusted for the freight train business on the curve would undoubtedly take place; it would take place, however, in a lesser degree. I have never investigated those two separate things to determine what proportion of the wear one causes and what proportion the other causes.

675 On April 22, 1913.

NELSON CADARETTE, a witness called by plaintiff.

Direct examination.

By Mr. Butler:

I am Assistant Engineer of plaintiff; I have been in that company's engineering department since Nov., 1891. My work has been particularly in maintenance of way and buildings; I have been over the line a great deal and am familiar with its location, lands used for railroad purposes, records, charts and maps, the latter being kept under my direction.

I furnished Mr. Riggs the records, maps, charts and other information referred to in his testimony. I furnished him Complt.'s Ex. 2, Riggs, condensed profile, horizontal scale, 5,000 feet to inch; vertical scale 100 feet to inch; Complt.'s Ex. 3, Riggs, blue print map of Soo terminal, scale 150 feet to inch; Complt.'s Ex. 4, Riggs, St. Ignace terminals 200 feet to inch, Complt.'s Ex. 5, Riggs, small map, Marquette and vicinity, scale 2,000 feet to inch, Complt.'s Ex. 6, Riggs, map of Marquette, scale 200 feet to inch; Complt.'s Ex. 7, Riggs, map of north Marquette, 200 feet to inch; Complt.'s Ex. 8, Riggs, Map of Negaunee mining district, 1,000 feet to inch; Complt.'s Ex. 9, Riggs, Map of Humboldt yard, 100 feet to inch, Complainant's Exhibits 10, Riggs and 10*a* Campbell, map of L'Anse, 100 feet to inch; Complt.'s Ex. 14, Riggs, sample page of track record, Complt.'s Ex. 15, Riggs, map of right of way Negaunee and Ishpeming, 400 feet to inch; Complt.'s Ex. 16, Riggs, map of D. S. S. & A., Houghton yard, scale 50 feet to inch; Complt.'s Ex. 19, Mason, map
of Baraga yards, scale 100 feet to inch; Complt.'s Ex. 20,
676 Hutula, map of Covington town site, scale 100 feet to inch;
Complt.'s Ex. 21, Wallen, map of Ewen yard, 100 feet to inch; Complt.'s Ex. 22, Hamar, Chassell, 100 feet to inch; Complt.'s Ex. 23, Oakley, another map of Covington, used by E. W. Allen, in his testimony and Complt.'s Ex. 24, Kunze map Sidnaw, 100 feet to inch. All these maps are from original records, or from re-surveys in my office, and show correctly what they purport to show.

I gave Mr. Hansel and his assistant full and free access to all the records of engineer's department, including bridge and other records I have referred to; they used the same freely.

On January 27, 1914.

CADARETTE recalled.

Further direct examination.

By Mr. Eldredge:

The principal use of the heating apparatus at the Soo is to heat passenger coaches in the yard; also, the passenger station and freight

house office (14 feet x 20 feet) are heated from the same house. I think there are four small radiators in the freight office, and that not more than .5% of the steam created in the plant is used in heating that office. With that exception, the heating apparatus is used entirely in passenger service.

The wye at the Soo, allocated to exclusive passenger business, is not used for freight locomotives.

The combination freight and passenger station at Brimley 204 square feet, is used for exclusive freight, 276 square feet is
677 agent's and telegraph operators' room, and 320 square feet for waiting room.

The waiting room at Wellsburg is 210 square feet and telegraph office 81 square feet.

At Strongs the waiting room is 256 square feet and office 128 square feet; replaced with new buildings since 1913. The freight was formerly kept in an old box car body, allocated to freight.

At Soo Jct. waiting room is 576 square feet and office 144 square feet, freight room 360 square feet; the office is used for joint freight and passenger, and over the men's waiting room of 288 square feet and the office of 144 square feet are rooms occupied by the agent as living rooms.

At Eckerman the waiting room is 192 square feet and office 192 square feet, the office is used as telegraph and ticket office combined.

At Newberry the office in passenger station is 320 square feet; the office is the only part of the station I would not call exclusive passenger; the agent has his telegraph and express office there.

The agent spends most of his time in the office, in passenger station; I cannot say whether he has an office in the freight building; he probably transacts some freight business in the passenger depot, as the trainmen get their orders and things of that kind there. Assuming he does all his freight business there, about one-half the office should be allocated to freight. He has to spend a good deal of his time making out his way bills and abstract, and one thing and another, and, I think, equally as much time selling and keep-
678 ing account of tickets.

At Seney the office is 150 square feet and waiting room 225 square feet; the office is used for selling tickets, taking care of freight business locally, giving train orders, a small amount of express business, and such commercial telegraph business as there is.

At Wetmore the office is 150 square feet and waiting room 225 square feet; second story is used as agent's dwelling.

At St. Ignace, the passenger station is exclusively used for passenger business; the freight office is in another building, the agent spending some time in both places; I think they have a telegraph operator at both offices.

At Marquette, 3,325 feet of the first floor is devoted to exclusive passenger; 350 feet occupied by entrance to second floor is devoted to common; the second floor contains 3,675 square feet, used for offices of General Superintendent, Assistant Superintendent, Roadmasters, Train Dispatchers and General Superintendents' clerks. 525 square feet would be occupied by train dispatchers; we have no

dispatchers at Thomaston, and all main line dispatching is done from this office; 150 square feet is occupied by Assistant Superintendent, whose duties are confined to Michigan; 200 square feet is devoted to chart room, where time tables are prepared; and 525 square feet by Car Accountant; the basement is occupied by heating plant, used for heating the building and the cars standing in the yard; 90% of the heat goes for the cars. In view of the fact that there must be a passenger station there, and that that passen-
679 ger station would require a roof, I should say one-third the value of the building should go to the upper part and two thirds to the passenger business.

At Negaunee the building stands on South Shore land, and is owned jointly by C. & N. W. and D. S. S. & A.; there is no use except for passenger and express.

At North Ishpeming there is no use except for passenger, express and telegraph office; the freight office is in the freight building; just one desk with instruments on it, 18 or 20 square feet is occupied by telegraph. Except the use by telegraph operator, if used for giving train orders, the use is exclusive passenger.

At Champion the passenger station contains two waiting rooms, 432 square feet and 288 square feet lunch room, 240 square feet and office, including telegraph and express office, the same as at other similar stations, 240 square feet. The agent has an office in freight station, for freight business but there is no telegraph office there. One-half the passenger station belongs to St. Paul road, and one-half to D. S. S. & A.; the space occupied by the two companies' Telegraph offices is 240 square feet. 15 or 18 square feet of office space is occupied by telegraph—just enough for a desk. The express office is a separate building. Except for telegraphing, the Champion station is used in exclusive passenger.

At Nestoria the passenger business contains two waiting, a lunch, baggage and office rooms; the office is used for ticket sales, train orders, and Nestoria freight business. The office occupies
680 240 square feet.

At Lake Gogebic, the dining hall, since spring of 1913 is used as a residence by South Shore agent.

At Thomaston the station contains waiting room, 410 square feet, lunch room, 399 square feet, office, 252 square feet and second floor, contains 252 square feet, used by Assistant Superintendent, when at Thomaston over night. Assuming upper portion joint freight and passenger, and excluding office, 25% of the building ought to be common; the office is used for telegraph, freight, selling tickets and in part by Assistant Superintendent as office when he happens to be there.

CADARETTE.

Recross-examination.

By Mr. Wykes:

At Brimley station the office is entered through the waiting room; if you went there to send a telegram, or had freight business with

that office, or took an express package for shipment, you would use the waiting room, and must use it to make any one of those uses of the offices.

That same thing is true at Wellsburg.

Wellsburg has a population of 10 or 12—the section foreman, his crew and the children—both passenger and freight trains would receive orders from that station.

At Strongs the same use would be made of the waiting room as at Brimley and Wellsburg.

681 That is true of practically all the places where the office bears a common use, or a partial freight use. There is no other way of getting into the office, except through the waiting room in most of those stations; a person doing a freight business with these offices uses the waiting room to get in and out, and for waiting around for receipts, bills, etc. There is the same use of the Newberry passenger station waiting room for such freight business as is done in the office there.

The agents occupy living rooms on the second floor of passenger stations at L'Anse, Covington, Paynesville and Keweenaw Bay; notwithstanding this use, stations containing rooms so used have been, in Complt.'s Ex. 1*a*, Riggs, assigned to passenger service. Where the living rooms of employes were in a separate building, that building has been assigned to common, as a rule. I should say practically the entire second floor of the Marquette station is in common service.

CADARETTE.

Redirect examination.

By Mr. Eldredge:

Trout Lake, in my judgment, 20% of the building should be assigned to the second story, used as living room for the agent. I think in those cases where buildings contain living rooms upstairs there should be a little more detail as to the allocation than Complt.'s Ex. 1*a*, Riggs, contains.

At Soo Jct. part of the second floor is a living room, and 20% of the building should be so assigned. At Wetmore one-third of the building should be assigned to the second floor use for living rooms and the same at L'Anse, Humboldt, Keweenaw Bay and

682 Paynesville. At Covington, the living rooms on second floor occupy but part of the building, and 20% of the total should be assigned to the living rooms. At each of those buildings where there is no upper floor, the station would still be required and must have a roof.

The portions fixed of parts used as living room were proportioned of entire building, and the same percentages would prevail applied to value as for space.

CADARETTE.

Recross-examination.

By Mr. Wykes:

I say one-third the Humboldt station is used by second story, on theory that you must have the roof, the foundation and two-thirds of the wall and material, anyhow. I simply place the extra amount that is added in buildings having a second story to the use to which the second story is put. The second story needs every part of the foundation, and the roof; we have provided, in instances, living rooms for agents or employees not in station.

CADARETTE.

Redirect examination.

By Mr. Eldredge:

I went over the line in July, 1913, and checked by actual measurement the dimensions of all stations and other structures, and their use, and correctly reported the dimensions to Mr. Riggs. I have examined Complt.'s Ex. 1*a*, Riggs, as to the items of station buildings and fixtures, shops, enginehouses and turntables, water stations, fuel stations, warehouses, docks and wharves, and miscellaneous
683 structures, and find that Mr. Riggs has used the dimensions and figures correctly, upon the information that I gave him; the mistakes of Mr. Riggs were mistakes in allocation and not in description.

CADARETTE.

Recross-examination.

By Mr. Wykes:

The office in the passenger station at Seney is used by the agent having charge of both freight and passenger business there, and for the telegraph instruments. I testified with regard to one station, that persons going to see the agent on freight business would, of necessity, have to go through and stand in the waiting room while they were talking with the agent or waiting for him, even though they went to see him on freight business. That is true in practically all these cases where there is an office for the use of a common employee in a station building; that is, that the persons who go to see him would go to see him at that office, and use the waiting room for that purpose, and to wait for him; this is the general rule.

St. Ignace station is used in telegraphing; the same for downstairs of Marquette station.

The cost of ticklers, omitted from Riggs' appraisal, wouldn't be less than $15 or $20 each. There are two or three around Mar-

quette; there are a number of others on the line; I cannot locate them; they would be where there is an overhead obstruction which we have around the iron mines, and in some cases at saw mills.
684 I don't know of any on main line; those at Marquette are on freight tracks.

CADARETTE.

Redirect examination.

By Mr. Eldredge:

The actual cost of bridge 94D was $18,830, at which it was included in Riggs' inventory.

CADARETTE.

Recross-examination.

By Mr. Wykes:

This is the gross charge, and includes loading and unloading of material, and does not include transportation of many items, percentage for use of tools, or overhead costs; just the actual costs of labor and material is kept track of.

The ballast record of the South Shore has been kept since 1891. From that record, I have prepared a table stating the condition of main line track, Dec. 31, 1891, and the amount of ballast of the different kinds at that time and that added since for each year, to June 30, 1913. I also show an estimated amount added for the balance of the calendar year 1913. For each year, 1892 to 1912 inclusive, the period is by calendar years, and in addition I show the condition of track, June 30, 1913, with the mileage of ballast of each different kind. The 50.7 miles is for the calendar year 1912. A portion of the ballast of late years has been carried in regular revenue trains of the company; some of that has been done in every year. Where the ballast is hauled in revenue trains, the haulage cost would not appear in the charges against ballasting.

(The statement prepared by the witness is as follows:)

Record of Ballast in Michigan (in Miles).

Condition of track.	Fine sand.	Sand and gravel.	Gravel.	St. Ignace gravel.	Mine waste.	Stamp sand.	Cinders.	Total miles.
Dec. 31, 1891	239.3	99.2	....	77.0	1.6	....	2.3	419.6
Added 1892	2.8	....	....	21.3	...	....	9.4	33.5
" 1893	7.0	25.7	....	9.0	1.2	....	5.3	48.2
" 1894	3.2	21.8	....	4.9	...	....	13.2	43.1
" 1895	2.8	24.7	....	6.3	...	....	1.7	35.5
" 1896	....	24.7	....	7.0	...	....	5.0	36.7
" 1897	....	22.0	....	9.8	...	.5	.3	32.6
" 1898	....	24.1	....	18.6	...	....	3.0	45.7
" 1899	.7	....	21.3	19.1	...	....	3.1	44.2
" 1900	2.0	....	8.1	2.8	...	....	3.3	16.2
" 1901	....	....	21.6	11.4	...	....	2.1	35.3
" 1902	1.1	....	13.3	9.2	...	....	1.9	25.5
" 1903	....	....	12.0	9.0	...	....	2.4	23.5
" 1904	....	....	....	4.3	...	2.2	2.4	6.9
" 1905	....	....	6.8	11.8	...	5.9	1.3	25.8
" 1906	....	....	7.9	13.8	...	5.9	2.1	29.7
" 1907	....	....	10.2	8.6	...	5.6	1.8	26.2
" 1908	....	....	8.1	10.0	...	5.0	2.0	25.1
" 1909	....	....	....	4.5	...	3.2	2.3	10.0
" 1910	....	....	3.7	....	...	....	.6	4.3
" 1911	....	....	1.2	7.6	...	2.0	2.0	12.8
" 1912	....	....	34.7	10.0	...	4.4	1.6	50.7
" to June 30, 1913	....	....	6.0	5.0	...	1.5	1.0	13.5
" balance of 1913	....	....	17.2	3.0	...	....	1.0	21.2
Totals	19.6	143.0	173.3	207.3	1.2	36.2	68.8	64.83
Condition of track June 30, 1913	16.1	....	194.9	139.4	...	25.3	43.9	419.6

6846 On May 5, 1914.

CADARETTE recalled.

Further cross-examination.

By Mr. Wykes:

I have prepared a list of the culverts, to indicate the changes made in culverts between June 30, 1911, and June 30, 1913, including both those due to changes in appraisal and changes by replacements. That furnishes the details of the changes in culverts on pages 28 and following of Complt.'s Ex. 1*a*, Riggs. The information I have prepared is as follows:

73 old wooden box culverts found in 1913 to be caved in and abandoned as waterways and called filled in the 1913 appraisal. No date of abandonment.

26 old wooden box culverts replaced with cast iron pipe between June 30, 1911, and June 30, 1913. Old box taken out and backfilling put in.

15 old wooden box culverts replaced with concrete pipe between June 30, 1911, and June 30, 1913. Old box taken out and backfilling put in.

4 old box culverts rebuilt with wood between June 30, 1911, and June 30, 1913.

685

16 wooden box culverts found to have been omitted from 1911 appraisal.

4 additional cast iron culverts put in between 1911 and 1913 appraisals, not replacements.

7 additional wooden box culverts put in between 1911 and 1913 appraisals, not replacements.

5 additional concrete culverts put in between 1911 and 1913 appraisals, not replacements.

2 additional concrete pipe culverts put in between 1911 and 1913 appraisals, not replacements.

1 cast iron pipe culvert omitted from 1911 appraisal.

10 open culverts found in 1913 to have been changed to box culverts. No date of change.

On July 21, 1914.

CADARETTE, recalled.

Redirect examination.

By Mr. Eldredge:

I have compiled a statement showing the percentage of curves, straight track, etc., on the main line of the company in Michigan.

From—	To—	Miles.	Number of curves.	Aggregate length of curves (miles).	Miles of straight line.	Miles of level line.	Miles of ascending and descending grades.
Soo.....	Wis. State Line....	301.54	289	47.38	254.16	46.75	254.79
St. Ignace....	Soo Junction.....	42.97	19	3.04	39.93	3.18	39.79
Marquette.....	Winthrop Jct.....	17.33	52	9.13	8.20	3.25	14.08
Nestoria.....	Houghton.....	48.24	81	14.06	34.18	14.76	33.48
Humboldt....	Republic	8.70	26	2.80	5.90	1.89	6.81
Total.....		418.78	467	76.41	342.37	69.83	348.95
				18.2%	81.8%	16.7%	83.3%

THIS PAGE BOUND

686 I know the terminal property of the D. S. S. & A. at Houghton. In the past, it has been used for shipping rock by boat to canal entry near Houghton, and logs have been unloaded there. The principal use I remember was when Portage Lake bridge was wrecked in 1905, when freight going north of Houghton was transferred across the lake at this point. In my judgment, it is necessary for the South Shore to use, as it is its only water front property north of Baraga; it has tracks paralleling the shore for its entire length, within 15 feet of the water's edge. The water is deep to the edge of the land, so boats of reasonable size can go within a few feet of land; should Portage Lake bridge again become injured, we should have to ferry, as we did before. Such an accident nearly happened this spring.

CADARETTE.

Recross-examination.

By Mr. Wykes:

In figuring curves on this line in Michigan, I have taken all curves of every degree, and didn't separate into different degrees of curvature. In figuring the amount of level line, I have taken all grades of every elevation or change of elevation.

The Houghton water front was used for stone work purposes to 1900, about four or five years before which it was used for transferring freight. When the bridge is out of commission, we run trains on it. We load the cars on scows at that point, and tow across the lake, and there transfer to Mineral Range. That was
687 during the season of navigation of 1905. We used the old trestle for that purpose. The scow can go only within 15 feet of shore. We transferred no passenger cars that way.

(This witness was later called to testify before the Court.)

688 On April 24, 1913.

CHARLES HANSEL, a Witness called by Defendants.

Direct examination.

By Mr. Wykes:

I live at Cranford, New Jersey; am 52 years of age. I am a civil engineer, economist and investigator, with offices in New York. My experience and education may be detailed as follows:

1. Locating and Constructing Engineer for Denver and Rio Grande Railroad, four years. Division Engineer, in charge of buildings of first division of the Denver and Rio Grande into New Mexico.

2. Chief Engineer, Wabash Railway, at age of 25, 1884 to 1889. During that time, originated premium system for inspection of railroads, which has since been adopted throughout the United States.

3. First Consulting Engineer, Railroad and Warehouse Commis-

sion of Illinois. Sent to Europe, by State of Illinois, to report on railroads.

4. Commissioner to Europe for the World's Columbian Exposition.

5. Vice-President and General Manager of the National Switch and Signal Company. Installed important signal work on all trunk lines in America and the first automatic signal system and power interlocking plant in England.

6. Devised complete system for commercial accounting and cost finding.

7. Commissioner, appointed by the Governor of Michigan as a Member of the Board of Review, to adjudicate problems connected with the State Valuation of Railroads. See Department of
689 Commerce and Labor, Bulletin 21, entitled "Commercial Valuation of Railway Operating Property in the United States," in 1904, p. 77, as follows:

"In order that there might be no question as to the suitability of the methods employed, a board of review was appointed consisting of Mr. Octave Chanute and Major G. W. Vaughn of Chicago; Mr. Charles Hansel of New York; and Prof. Charles E. Greene of Ann Arbor. All these gentlemen are members of the American Society of Civil Engineers, Mr. Chanute being a past president of the society. With years of experience to ripen their judgment and with minds free from all details, they are asked to consider the different questions arising in the work about which there might be doubt, and to formulate rules for procedure in those cases admitting of a variety of opinion, as, for example, the division of rolling stock in interstate roads, the value of right of way, the percentages to be added for the items of engineering, legal expenses, interest and discount, organization and contingencies, and many others."

8. President of the firm of Charles Hansel and Company.

9. Chief Engineer, Cincinnati Union Depot and Terminal Company.

10. Commissioner appointed by Gov. John Franklin Fort of New Jersey, on May 4th, 1909, to appraise railroad and canal property in that state. The Legislature of New Jersey, in 1910, decided to have the work of revaluation of railroads conducted by one commissioner, Charles Hansel. During the past year, some 80 men have been engaged in surveying every foot of railroad property in the State. This will be the first complete work of the kind ever attempted.

11. Member, American Society of Civil Engineers.

12. Member, Special Committee of American Society of Civil Engineers, on Engineering Education.

13. Member, Engineer's Club at New York.

690 14. Member and Past-President, Chicago Engineers' Club.

15. Contributor to North American Review and various technical journals.

I am engaged to supervise the valuation of the Pennsylvania railroad and its affiliated companies, and in the second place I am a member of the eastern committee of four appointed by the special

committee of railroad presidents, consisting of 18 presidents, to confer with the Interstate Commerce Commission and assist in conducting the valuation of all the railroads in the United States, under the Federal Valuation Act, socalled.

The Indiana Harbor R. R., now consoldiated with the New York Central, was constructed from Indiana Harbor to Dansville, Illinois, 110 miles in length, double track, and crossing the arteries of 23 railroads east and west, the majority of which crossings were at grade. I was in charge of the negotiation of all the contracts for these crossings with the other railroads. I also had direct charge of designing and installing all of the water stations, and was Consulting Engineer for the whole system, and at different times I acted as President. From the time we began construction to the time we got in operation was about nine months; handled about six million yards of earth.

The New Jersey appraisal comprehended 125 corporations. The majority of them are involved in what might be termed seven systems; for instance, the Central of New Jersey has 27 subsidiary corporations. The systems are the Pennsylvania, the D. L. & W., the Lehigh Valley, Erie, Central of New Jersey, and the Susquehanna & Western. I was in absolute charge of everything, and the officers of the State were called upon under the joint resolution to assist me in anything I asked of them.

691 I was engaged to make a valuation; after having done so, I incorporated that valuation into an assessment for taxation. After that, the State retained me to defend the assessment in the appeals of the railroad, so the whole time was over two and half years. The highest number of men I had engaged was 110; we cross-sectioned every foot of railroad and got our own data, as very little data existed in the hands of railroad companies, because it was an accumulation of little old companies incorporated into a big system, and they themselves had very little information, and it was so important in value that we ignored all data, and cross-sectioned, measured and calculated every item in the State.

New Jersey is more or less of a terminal state; consequently the percentage of miles of route or distance between points to the total miles of all tracks is small. In other words, while there are but 2,550 miles of route, there are over 5,500 miles of track, there being considerable third and fourth track there.

With reference to my connection with the Michigan 1900 appraisal, a board of review was appointed consisting of Mr. Octave Chanute, Major G. W. Vaughn of Chicago, Mr. Charles Hansel of New York, and Prof. Charles E. Greene of Ann Arbor, they were asked to, and did, consider the different questions arising in the work about which there might be doubt and to formulate rules of procedure in those cases admitting of a variety of opinion, etc.

The plans on the Cincinnati work in which I am presently engaged as Chief Engineer call for an investment of about 35 million.

692 In the detail I have given of my experience, I have just given the principal employments and works that I have been

engaged in, to show the variety of experience, instead of all the experience.

It might be interesting to observe that in New Jersey is found all of the problems of construction that are to be found in all of the other states. For instance, we have the heaviest construction, in New Jersey, of any state in the Union; that is the D. L. & W. cut-off. Then we have some of the cheapest construction; we have the most costly tidewater terminals; then we have tunnels in various classes of rock, some in the hardest in the United States; then we have subaqueous tunnels and canals, which we valued.

I began my investigation of South Shore August 5, 1912. I made an inventory, and found the cost of reproduction new and the present value of the entire property engaged in railroad business in Michigan.

Defts.' Ex. 15, Hansel, is my inventory, and contains my results. I proceeded upon the specifications as shown upon page 5.

The prices applied and the items and property taken were as of October 1, 1912, as nearly as I could fix it. The prices were obtained from my experience and office records, where I have a great deal of such data, and extensive compilation of unit prices. Those prices were checked with the actual costs to the plaintiff of certain of the same class of articles, as indicated by the books and vouchers, and in my judgment the prices used are fair, reasonable and proper. They would be fair not only for October 1, 1912, but also for a con-
693 siderable period before that time. The prices given to us or found on the purchasing agent's or auditor's books, were surrounding or before that period. For a year or more before this date the prices would be lower, because materials and labor have advanced. I endeavored to give plaintiff credit for what they would have to pay about October 1, 1912.

My experience has indicated that the tendency of prices to October 1, 1912, was up. General tendency applying to all items that enter into railroad construction would indicate that during the past few years there is a more or less upward tendency in prices. The labor and material costs more money. On some things, where skill comes in, such as concrete, we are cutting down the price. The ratio of operating expenses to earnings is converging. The only thing which can keep them apart is the volume of business.

Defts.' Ex. 17, Hansel, is framed upon Complt.'s Ex. 2, Riggs; the areas upon it within the red line are intended to show what I find to be the land presently devoted to railroad use. It applies only to rural lands.

The purpose of the plan was to include, as devoted to railroad use, the part within the continuous red line, except where it is excluded by the broken line within it. Where the continuous red line is made by a broken line it is intended to indicate that the company had no deed to the property, but were occupying it, and we gave them the benefit of ownership, as if they had a deed. Opposite the line from place to place is a statement of the number of feet held or owned by the company. The lands in the smaller villages are included in Defts.' Ex. 17, Hansel, except where we have furnished de-

694 tailed maps, which will be later introduced as exhibits. Where we stopped computing the rural right of way and began the computation of high priced copper or city lands, that is indicated by a dark line drawn at right angles to the rigth of way with a cross at each end. Defts.' Ex. 17 is intended as a graphic description of what is indicated on page 16 of Defts.' Ex. 15. Being on a very small scale, it can only be graphic and approximately correct. Defts.' Ex. 18, Hansel, is a blue print map of Sault Ste. Marie, showing the lands of plaintiff (in red) and Soo line (in yellow) and Soo Union Station grounds (in black). Each parcel referred to in Defts.' Ex. 15 is given a corresponding number on Defts.' Ex. 18.

Land on Defts.' Ex. 18 included within the single yellow ink line is that which in my judgment is devoted to railroad use by the two companies at the Soo. I have considered them as operating as a whole, and allow them the necessary land for joint operations, and divided the land between them equally. I have indicated on the map the non-railroad use in yellow lettering.

I did not include any of the property of the depot company in the body of the report (Defts.' Ex. 15), but included it in the appendix (p. 256). The value stated opposite various descriptions of land (pp. 17-22 of Defts.' Ex. 15) are the present value of the land. That figure represents my judgment of the present value of each of these descriptions, and I would consider that was the value to acquire, considering all the elements. I did not depreciate any values for land. The value opposite each description is the value or cost to acquire which I have fixed.

695 Total value of land used by South Shore in Chippewa County is $55,423; by Soo Union Depot $56,600; total $112,023. In getting at the value of land for Chippewa County, we examined the prices placed on the property by Mr. Riggs, investigated the character of the property, and based our conclusions on those investigations. Our differences are mainly in area for property in Sault Ste. Marie. I have practically accepted Mr. Riggs' prices for that.

In the mining district, values are very problematical, depending greatly upon the owner of the mineral rights in some cases. In the Negaunee and Ishpeming districts, we established a value of $3,000 an acre in the active mining portions and $1,000 in the potential mining district. The values in Ishpeming and Negaunee were taken at a higher figure.

Defts.' Ex. 20, Hansel, is a detailed map showing the railroad property included at Marquette. The descriptions are identified on it by the numbers appearing opposite the descriptions (on pp. 19 and 20 of Defts.' Ex. 15).

Page 18 of Defts.' Ex. 15 shows railroad (red and green) and non-railroad (yellow and brown) use.

At Marquette, we separated the shore front property, in that we gave it a value for the riparian rights separate from the up-land value; we examined the records, to ascertain the considerations which had been given for various properties, and also the assessed value, as a factor in aiding us in our conclusions. We ascertained the value of

contiguous and similar property, and made some inquiries of
696 real estate men, though not extended. Based on those investigations, I arrived at the values stated.

In getting the values of $1,000 and $3,000 per acre in the Ishpeming and Negaunee districts, we investigated, as far as we could, conditions attendant upon construction there; owing to the mineral rights, the conditions were ususual. The analysis of such purchases and payments as have been made would, in our judgment, average through that territory $3,000 in the active, and $1,000 in the inactive, districts. The value must of necessity be an estimate and a matter of judgment. Our judgment was dependent in part upon the inquiry and upon knowledge of prices paid in condemnation proceedings.

While some of it would be higher, some of it would be lower, and it is impossible to judge it accurately. I don't know of any expert in that particular class of values; I don't pretend to qualify as such. It is the same judgment that I would give a client of mine who had engaged my services to tell him what he could do in a certain territory. This is my judgment, all through. It was based upon my belief as much as anything, from experience, and going over the territory, and inquiries made by myself and my subordinates.

Defts.' Ex. 21, Hansel, is a blue print showing descriptions in the mining region. The values through the mining district were arrived at in the way just described. We did not there take into consideration the normal value as reported by the Tax Commission.

In reaching the land values in the various places, we used whatever information was available, and made inquiries as we
697 could, except in the cases of rural land, and observed carefully the conditions, character of soil and location, and, to some extent, used sale values. In Marquette, for example, we took them from the county records, assuming that the specific consideration was correct. The sale value is oftentimes hard to get at from the records. I would rather have the opinion of a man experienced in getting right of way than to depend upon the sale values shown on the records.

The values I placed upon the land are, in my judgment, fair and reasonable, and I have also included sufficient values for rural lands to take care of the added percentages for cost to acquire for railroad purposes.

My values for land throughout represent my judgment of cost to acquire for railroad purposes. I considered the cost of acquisition to be the value. I only made use of Mr. Riggs' results (except where otherwise stated) as to land values.

I used three prices per cubic yard for earth grading: 20¢ for easy work in sand, 40¢ for grading at sink holes and soft ground, except on the new double track east of Negaunee, and 26¢ for other earth work. For loose rock, I used 50¢ and for solid rock $1.35.

The quantities were considered in relation to the work. Sometimes the character of the material is not the essence of the cost; a fill of a foot scattered over long territory would be costly, no matter what material, while if 3 to 6 feet high it could be done cheaper.

This illustrates that the price depends upon a variety of things. The
698 prices I fixed are, in my judgment, sufficiently high. It has been my experience that grading in construction could be done for the price I fixed. In my judgment, the entire grading, clearing, grubbing, retaining walls, and rip rap could be produced new for the amount I have stated, or less. The amounts are $2,442,311 for value new, and $2,419,763 for present value (p. 37, Defts.' Ex. 15).

The average price of ties during the past five years, as determined from reports to the State Board of Assessors, was 33 cents. To this we added 7 cents to cover inspection, loading and transportation, making a total value new of 40 cents per tie. The 55% condition I use assumes a life for the tie of 7 or 8 years. Many of them are not good for that time. On the very best maintained railroads, where they use oak ties and stone ballast, we figure the average is about 75%; 75% of value new may be 100% efficiency. I do not say that fixing 55% condition is fixing the per cent of efficiency, because that wouldn't be fair to the railroad.

The wear on curves is on the inside of the outside rail and on the top of both rails. The tendency of the curve is to force the flange of the wheel against the inside of the ball of the outside rail. I would not expect to find any more wear on the inside rail than on pieces of straight track.

I am now speaking of general conditions. A curve could be so sharp that the trucks of a freight car, which had been standing and had gotten stiff, wouldn't slew, and then you might find a wear on both the inside of the outside and the outside (inside) of the inside rail, but you wouldn't be apt to find it there; still it could possibly be some contact there; I would say practically no wear.

Q. That is on a sharp curve?

A. On a curve practically that you couldn't operate a passenger
699 train around at all, but even on that curve the greater wear occasioned by that condition that I have named would be on the inside of the outside rail.

Q. Take where the outside rail is super-elevated and take a normal curve, not a sharp one, what would you expect to find there as to the condition of wear; where would you expect to find it?

A. On the inside of the outside rail and the top of both rails; in other words, the cross-section of the ball of the outside rail would be diminished greatly in excess of the cross-section of the inside.

Q. Would you expect, or has your experience indicated, that the super-elevation of the outside rail causes a greater wear on the inside rail?

A. No sir.

Q. Now, it has been stated in this case that the super-elevation of the outside rail causes a greater wear of the inside rail due to the movement of the freight traffic, in that the outside rail is elevated for the passenger service a little higher than that service requires; is that a true statement?

A. I would consider that it was not a true statement of conditions.

Q. And you would not expect, then, the freight train in passing

around that curve, where the outside rail was elevated for the passenger service, to cause any greater wear to the inside rail than as if the outside rail hadn't been elevated higher than the requirements of the freight service?

A. I would not.

700 The Master: Can you see how there might be a difference of opinion with regard to that?

A. No sir, it is a matter of fact; it is not a matter of opinion.

Q. Have you ever made any observations?

A. Many.

Page 133, Defts.' Ex. 15, Hansel, Ballast. In my judgment, ballast should be depreciated; I find the cost of ballast on the South Shore, exclusive of side tracks, to be: new $667,807; depreciated $560,480. I got at the amount of depreciation by its condition, and through experience that ballast is always in a depreciated condition, average throughout the road. They cannot ballast any considerable amount of the line at one time, because it has got to be done between trains; even if they set out with a ballast outfit on every section of the road, they would have to do it between trains. There is always a hiatus there when they cannot do that, and there is always a depreciated condition.

Ballast new is worth what it costs, if worth is to be determined by cost of acquisition.

I have great difficulty with this term "value," and I am trying always to have hooked on to it some application. If the D. S. S. & A. property was today for sale as a going property and I was called in to tell proposed purchasers what they would have to spend to put that in hundred per cent condition, I would have to include something for ballast, and that something would be the sum I have set forth here, as near as I can judge.

701 The Master: Now, would you determine that by inspection or by some rule of depreciation, or how would you get at that precise amount?

A. I would do it exactly as I have done it. That is the only way I know how to do it. Ballast, in depreciating, increases in the value by solidification, and some percentage perhaps should be added to an old road for a certain purpose on account of the fact that it is old, and the ground is settled, but you would hardly feel, on the other hand, that they were to be taxed on that theory, and yet the intrinsic value of the property is increased by seasoning.

Q. The ballast might be depreciated to a certain per cent and still the ballast perform the office of carrying the traffic just as well as if it were new?

A. Yes, if that per cent is maintained right along as an average per cent all over the line. Here I might have a hundred per cent adjacent to 25 per cent; to-morrow that 25 per cent is changed to a hundred, and the hundred begins to depreciate, and so on all along the line, it is constantly evoluting.

Q. When you say the hundred begins to depreciate, that means you are approaching, all the time, nearer to the point when you must renew it?

A. Yes, that is it.

Q. And if it never required to be renewed, and would fully perform the office, then it could be carried at a hundred per cent, could it not?

A. Yes, but it must be, and is, renewed constantly.

702 Q. And if the South Shore were all ballasted new tomorrow, and you were making a report for purposes of purchase, that would include the element that you had a time ago of the expenditure necessary to bring it to a hundred per cent condition; you would not then include anything on account of ballast, would you?

A. No.

Q. But if, on the other hand, all of the ballast were five years old, would you include something?

A. I would. That is because the ballast, having been in the track for a period greater or less, there must be some renewal.

Ballast is somewhat peculiar in its relation to upkeep; it is a never-ending cost of upkeep of the track; there is no time in the working season, between the time of frost going out of the ground and the imminent danger of frost coming into the ground, that ballasting is not being carried on. Even in the very best conditions, there is a constant flow into the property of ballast all the time; it disintegrates, blows away, and settles into the embankment, perhaps owing to the character of the ballast, or, depending upon the character, it may settle into the earth beneath it, but other classes blow away and are carried away by the elements, so that there is a constant stream of upkeep there all the time, and yet it cannot be up to a hundred per cent.

The greater part of the depreciation is dependent upon the country, the climatic conditions and the ballast; stone ballast is not affected very much by weather conditions. On this railroad the sand would be materially affected by weather conditions—perhaps more by wind than by rain; and gravel, not so much. St. Ignace gravel is

703 good *is good* gravel; it enriches the roadbed, without any corresponding value. The seasoning makes a better roadbed. All things that help to season it make it better.

On pages 234, et seq., Defts.' Ex. 15, in addition to the values fixed, I added percentages to take care of overhead expense of survey of the line, right of way, engineering, taxes, inspection of equipment and contingencies. All the items contained in the schedule have been considered and affected with overhead charges. All the overhead charges are computed upon other overhead charges; for example, the contingency item was included in the amount on which interest during construction was computed.

In Defts.' Ex. 15, beginning with page 234, I have treated in detail the subject of overhead and incidental expenses. What is there set forth was prepared by me and represents my judgment.

The first expense in railroad construction is the survey of the line, which in the case of the plaintiff would be comparatively uniform for every mile of road. On the other hand, the ratio of the cost of survey to the cost of construction would be above the average, because the graduation is light, and a survey conducted in the sum-

mer would be impeded by foliage. We have fixed the cost of survey by actual estimate at $50,000. If we stopped there, it would appear that $50,000 was the only item that was considered for the engineering cost, but, instead of putting on percentages, as is commonly done in the estimate of a prospective construction, I have analyzed each factor and tried to get at exactly what I would have to spend for each of these various items, and to that sum we
704 have added ten per cent for unfor-seen expenses. In my judgment, the surveying portion of the engineering cost could be done for the sum stated. We all know that there are no engineering difficulties on this line, and that any engineer qualified as a division or resident engineer would be fully competent to take the post of Chief Engineer of this particular railroad. In order to compute that sum of $50,000, I constructed ten survey parties, and in that way, considering their compensation, subsistence and other incidental expenses, and in view of the ease with which the survey could be made, excepting some isolated cases, I considered that particular item, included in the total of engineering, would be covered very easily by $50,000.

Such structures as are on the line would be designed by the bridge company; the organization for the survey and construction of such a character of road would not call for the services of a bridge engineer in the company's employ, because there are so few structures that he would have to design. I myself would send the bridge company the cross-section of the stream, and give a general design of what I wanted, and they would then prepare details and they in turn would be criticized by the chief engineer, but he wouldn't himself be apt to attempt to design those structures, which are insignificant.

Q. Now, what other engineering costs have you found would exist on the South Shore?

A. The engineering costs during construction, and perhaps after construction, so far as the equipment is concerned.

The Master: Better take it in sequence.

The country traversed is practically devoid of highways.
705 The first construction would be the building of telephone lines, to establish communication; headquarters would be established at various points, including railroad crossings, and the entire construction would be completed within two and half years. Construction could be hastened by employing a larger force and increasing unit prices. It wouldn't be practical, however, to attempt to open up the work on the entire line at once, as the quantities in graduation are not sufficient to induce grading outfits to come into the territory for short-time work. Two years and half should be the maximum time for any specific part of the road to be constructed in. It wouldn't be advisable to start construction all over the road at the same time, build certain portions of it, and throw it into operation just as soon as possible. While I have not said that I thought the entire proposition could be accomplished in two and half years, I would undertake to do it. The faster you do those things sometimes, the more economical it is, instead of drag-

ging it along and fiddling. Two and half years would cover the interest charge on account of construction. That means that if they started it all simultaneously they could of course get it done very much under two years and a half, instead of over.

On the Indiana Harbor railroad, from the start of construction to the finish was a little over nine months, and we handled six million yards of earth in 110 miles, and we crossed 23 different railroads, which of course is an impediment to construction, because they don't allow contractors' teams to cross operating railroads, so we had to ship in the contractors' outfits, and unload at each of the several crossings, so they could work each side of the crossings. Those crossings also required safety appliances; we had to interlock all the crossings. I negotiated all the contracts with the various railroad companies, and installed the signal apparatus, be-
706 fore any crossing of the senior company was permitted. That was accomplished within the nine months.

Engineering headquarters would be at Marquette, with different residences east and west. Material yards would be established at Sault Ste. Marie, St. Ignace, Trout Lake, Shingleton, Marquette, Ishpeming, Sidnaw and Houghton; that would be the plan that I would use. It is estimated that ten field parties equipped for camping would be required during the entire period of construction, at a total expense of $170,000. I would be very glad to undertake that contract for that amount of money. In addition to the above expense, the main office at Marquette, with two divisional engineers, would have to be maintained, at an additional expense of $35,000, or a total for the field and office engineering force of $205,000, exclusive of the $50,000 first above mentioned.

Without suggesting that the qualification of your divisional engineer is not such as would fit him for more difficult work, I would say that he would be fully competent to take charge of this as Chief Engineer; that is to say, if you wouldn't bring an engineer who from his age or experience or practice would cause him to demand $25,000 a year, he wouldn't be as good as Mr. Cadarette at the salary he is getting, or I would hope some advance over that, so that I only speak of this to show that it is not high class engineering; almost any graduate one year in the field would be competent to supervise that. I fixed this in a lump sum, instead of by a percentage, because to my mind a lump amount does not signify anything, but if you analyze, as we now do in all construction accounts, the closer you analyze the more accurate you can be. Any given per cent is ab-
707 surd, because five per cent on one road would be entirely insufficient, whereas on another it would be entirely too high, on account of the character of the work; there would have to be more engineers on the building, for instance, of a line like the New York, New Haven & Hartford, and they would have to be higher class average engineers. All that a chief engineer here would need would be a field party or field parties in charge of a transit man, whom you could easily get at from $100 to $150 a month, and I based it on the higher figure.

In a recent appraisal on the New York, New Haven and Hartford,

to justify securities that had been issued, an amount was fixed for engineering which, reduced to a percentage to compare with mine, was 2.2%. Percentage for engineering signifies nothing; you must know the items it is on.

The N. Y. N. H. & H. is not comparable with the South Shore; it is a grand terminal railroad, with a most costly terminal and hundreds of junctions; there are 50 odd companies in the leased line, and each of them has to join on somewhere. This is illustrative of the fact that it is absurd to compare a flat percentage until you know what it is to be applied to. I don't think that this average percentage included the value of the land. The percentage of 2.2 seems to be the total allowance reduced to a percentage on the total value.

Mr. Butler: Yes, it is not the way it was applied. He takes the dollars allowed for engineering, and applies it to a sum including the value of the terminals and right of way, which would be a very very large sum in this grand terminal, wouldn't it?

A. Yes, on that subject, and illustrating further why the New Haven is an entirely different condition is that the class of
708 patrons demand such a high class of service, and the public utilities have urged upon them very large expenses for the benefit of the public, and all of these expenses include very high class engineering; for instance, the New York connection over Hellgate, with the biggest arch ever constructed. It requires very much higher class engineering, and, in fact, in the appraisal of the New Haven by John F. Stevens, he thought it necessary to have two men, to each of which he paid $10,000 annually, and the others in the same proportion, showing that he felt, on account of the great value of each item in the property, that they must get high class talent. The new Haven company has a great many tide-water terminals that are very costly, and under the Massachusetts law they have to eliminate a great many grade crossings, and they are doing it also on their own motion. That was an expense that is not found at all on the D. S. S. & A. The same might be said of the Pennsylvania, or any first class road, but the New Haven stands in a class by itself as to the cost of operation and cost of plant; therefore, the engineering per cent would hardly signify—it has to be analyzed closely.

I added for taxes during construction a general amount of $50,000, and 1% upon the real estate, making $63,709.

Q. The contingency item; you have allowed something to cover that, and will you tell us how you arrived at the amounts that you fixed, and what amounts you have added?

A. In the construction of a railway in a new country, where many of the conditions are unknown and frequently difficult to estimate, the engineer must make provision for these unknown costs. This is frequently done by adding a percentage to the total of the established cost. Where the right of way and terminals or termini re-
709 quire the acquisition of costly lands, where the consequential damages are likely to be high, a considerable sum should be provided for contingencies. In the case before us, we know all the conditions, excepting, perhaps, I should have added the foundations of the retaining wall and some of the bridge columns, because they

were examined, and there is no important construction where the foundations are hidden, and in case they are we allowed liberally for such unseen foundations. We have estimated the extra quantities of graduation necessary because of sink holes and soft ground, and the quantities of graduation measured in the full prism have been increased wherever the condition of the ground has shown the necessity of additional material, as demonstrated by several years of operation. Now, those soft spots, a good many of them, would not have appeared in the construction or the survey of the road, especially in the survey of the road; the engineer wouldn't be apt to sound all of these depths, because it generally is done by the cross-section party, but the estimate has to be made before you can finance and before any cross sectioning is done. The waterways and bridges have been computed as they actually exist; therefore, there is no question of contingencies in the reproduction of the thing which has been built. In further explanation, if any is needed, of that paragraph, I would say that the difficulty in a first survey is to decide upon the openings for water and for other purposes. Oftentimes it has been found after the road was in operation that their openings were insufficient. I think, generally speaking, that is true, but, having built these and having had the experience of the openings and bridges necessary, the contingency so far as that condition has occurred is, I think, eliminated.

710 The ballast has been measured, as stated yesterday, as have the ties and rails, and all stations and structures are fixed quantities. Now, before you construct, you cannot imagine properly all of the buildings which you would have to have in your final operation, but, having these now before us, we know what we have got to produce to make an equivalent of the present construction. Shrinkage has been allowed for embankments, and in taking profile measurements care was exercised to favor the greater quantity. I was particularly concerned about that, and gave instructions that they should be called off from the profile by two different persons, at different times, to check up any error, and always give the measurement in favor of the higher quantity instead of the lower. In view of the care with which the elements have been separated, measured and considered, we do not feel that an allowance of more than 10 per cent should be made on the following: Grading, Sidetracks, Shop Machinery and Tools, and Engineering. After having added on those items, as before stated, for engineering, we again add ten per cent legal expenses, organization and general interest and taxes, furniture and fixtures and stores and supplies. To all of these items has been added ten per cent after having in graduation; for instance, included quantities that did not appear in the prism but were assumed to have been used in the construction, and after adding very heavy percentages to some parts of the road, in order to determine the final quantity, we then again add 10 per cent to cover any possibility.

Q. Now, why would not such a contingent allowance be necessary on such items as ties and rails?

A. Because they are capable of being accurately determined.

We did not count all the ties, but counted typical sections
711 and then took also the standard of the railroad company into consideration as to how many ties they expected to keep up in each mile of track, so that the rails and ties are not subject to contingencies as long as you know the distance which you have to cover—the miles of route.

Q. The method of your ascertainment of those items, for example, ties, is equally accurate for practical purposes as a count, is it not?

A. Yes, I think so. It is hard to vary the number of ties in a given length of rail, because, even if you desire to get more ties in than 16 or 17 to the rail, it wouldn't be policy to do it, because you have got to get between the ties with your tamping bars, and if you get them too close you couldn't tamp up the road.

Throughout the entire line there are no conditions which invite legal troubles, except through Negaunee and Ishpeming; a small legal staff acting with a right of way agent would have no difficulty in handling all legal matters. In addition to the $20,000 provided for right of way agent, we think that $50,000 will cover the legal expenses, making a total of $70,000 to cover the item of acquisition of right of way and the legal expenses incidental to any other feature of construction.

It is impractical to determine the office cost of acquiring land by using some per centum of entire cost of the road. The right of way is through a very thinly settled country; much of the land is held in large tracts, and in our estimate of cost to acquire we have added at least a hundred per cent to the normal average value of the rural land in each county. We believe that, with the D. S. S. & A. obliterated,
if we were given the task of acquiring a right of way, much of
712 the land would be acquired free of cost; rights of way and additional lands are acquired by operating railways in States where land values and consequential damages are much greater than in the Northern Peninsula of Michigan for not more than 25 per cent in excess of the normal value. We are required, however, to determine as near as practicable the sum that is necessary to produce certain property. It is a suppositious case, and we feel that all coubt should be resolved in favor of contingent or unforeseen expenses; with these conditions in mind, we have included in the overhead expenses a sum of $20,000 to cover the expense of the office, the field force and the right of way and land agent. That, added to your $50,000 for legal expenses, makes the $70,000 that I included under Legal Expenses.

The organization, drawing mortgages, etc., will be done by the legal department, the printing of bonds and stocks and the general administration over and above the engineering and legal expense should not exceed $100,000. I consider that a very liberal figure. That is an arbitrary figure. You couldn't figure a percentage. It is better to have as much analysis as you can, I think, of all these items.

The $100,000 was just my opinion; you couldn't analyze it; nobody can tell how much you are going to pay for the printing of bonds or stock until you have them printed, or the cost of drawing

a mortgage and of supervision. I don't see how anybody could do anything more than say, well now, with such a force for a period of time—I do analyze it to a certain degree, by going over those features—such a salary, the head of the department and his aides would be perhaps such as a superintendent of construction, after the operation had partly begun, until that time construction
713 should be in the hands of the chief engineer, but there is in the handling of construction trains, as soon as you get up to that point why you are out of engineering department and into the operating department, but it has been the fashion to keep up that construction account as long as they could, and many of the railroads in the country have been seriously handicapped by that construction account because that was a common dumping ground for anything the promoters saw fit to dump in there.

Q. You have added by way of interest on the investment during construction; will you give us the methods *at* which you arrived at the amounts or percentages added, and the amounts?

A. The financing must provide for interest on all disbursements during construction. This interest must be paid, not only upon the actual money expended, but upon the face of the securities hypothecated to secure the money; construction bonds bearing 5% cannot be sold on better than a 6% basis, or about 85; it is impossible to precisely determine the amount of interest chargeable to construction, but it can be fairly approximated, and I have endeavored to analyze that feature as follows: The first important item is the right of way in lands; upon this item, interest at 6% is allowed for two years, or 12% in total; items 3, Graduation, and 5, Bridges, Trestles and Culverts, may be fairly considered as evenly distributed throughout the entire period of 2.5 years, and on these items we allow interest at six per cent for 1.25 years, or 7.5% on the total under schedules 3 and 5.

Item 6, Ties, will be purchased as soon as possible after construction is determined upon and paid for when delivered on the line. The number of ties required would necessitate shipments from
714 outside, which would possibly be received at railroad crossings, where tie yards would be established. The average time of purchase would not exceed 1.5 years, and we have allowed 9% on the purchase price of ties. Items, 7, Rails, 8, Track Fastenings, and 9, Frogs, Switches and Crossings, are put down last, but in order that no delay may occur, these materials should be delivered at the various yards in advance of the time the roadbed is ready to receive them, and on these we have allowed 6% interest.

Item 11, Track Laying and Surfacing, is figured 6%, and Item 10, Ballasting, should follow track laying immediately, so as not to kink the rails. The expense attendant upon these two items should not cover a period longer than one year, and, to provide for the interest charge, six months' time has been taken for the average, or 3% on items 10 and 11.

Item, 12, Fencing, is the last item constructed, ordinarily, and is generally left until the road is open for operation, when men and materials can be conveniently transported. We have allowed three

per cent on this item, as on 13, Crossings, Cattle Guards and Signs, and 14, Interlocking and Signal Apparatus.

Item 15, Telegraph and Telephone Lines, is one of the first expenses, and on this we have allowed 12%. Item 16, Sidetracks, are built partly during the time general construction is going on and partly after the line is in operation. An allowance of 6% has been provided to cover interest on this item.

Items, 17, Station Buildings, 19, Shops, Enginehouses and Turntables, 22, Water Station, 23, Fuel Stations, and 28, Miscellaneous Structures, are built after grading is completed, and are not
715 generally finished much in advance of the line. They are generally delayed until we can carry the material on cars. Materials must be purchased in advance, and an average of six months consumed in construction. To cover this interest charge, 4% has been allowed on items 17, 19, 22, 23 and 28.

Items, 20, Shop Machinery and Tools, and 18, Construction Tools, are allowed interest at 3%, to cover the average time on hand before the road is opened, and, of course, in machinery you always get credit if you ask for it, 30, 60 or 90 days, especially if you are buying an amount sufficient to accommodate the whole road.

Items 26, Docks and Wharves, and 27, Electric Plants, are among the last items to be built, and none of these structures will require more than one year to construct. To cover interest, 3% has been allowed.

Item, 29, Survey and Engineering Supervision, will continue throughout the work; an interest charge of 7.5% has been provided.

Items, 30, 31, 32 and 33, Equipment, is generally purchased through an equipment trust agreement, outside of the construction equipment, which is provided by the contractor or taken care of in the unit prices allowed for cost of construction. No equipment is required until the road is put into operation, and generally the first interest coupon doesn't become due until six months after the equipment is received. So no interest charge has been allowed for equipment.

Interest is allowed on schedules 35, 37, 38 and 39 at 6%. The largest expense will be during the latter part of the work, consequently a rate of 6% on total expenditures will fully cover interest charge on those schedules.

716 Q. Would the money on the bonds all be turned over to the railroad company at once, or would the bonds be turned over as the money was needed, as a matter of practice?

A. I should expect to turn over bonds to the bank as I hand vouchers to them to pay, as near as may be; I would always have to give somewhat more in the bonds than the actual monthly pay-roll would call for, or monthly accounts. Of course, if the whole sum was to be borrowed and deposited in the bank of the company who was financing it, it would be very good financing for the banker, but very poor for the railroad, and I wouldn't consider that that would be done.

Engineering on Roadway and Structures, including the survey, $255,000; Engineering on equipment, $61,042; Contingencies,

$479,735; Legal Expense, $70,000; Organization and Administration, $100,000; Interest, $745,349; Taxes, $63,709. In each of these, the value new and present value are the same, none being depreciated; in my judgment, these amounts are sufficient to cover the expense of these items.

For the entire South Shore property, including every item noted, the total value found by me is: cost of reproduction new, $15,531,227; present value, $12,596,114. Those are my final figures for the value of the physical property, including an estimate of $100,000 cash for working capital, but not including the property of the Mackinaw Transp., Soo Union Depot, or Soo Bridge, Companies.

My value, before addition of overhead charges, is:

717

	Value new.	Present value.
Physical value before overhead charges	$13,756,392	$10,821,279
Overhead charges	12.9%	16.4%
Overhead	1,774,835	1,774,835
Adding Overhead	$15,531,227	$12,596,114

I did not follow the practice of taking the flat percentage of each item of overhead cost; I attempted to deal with the case as it existed. I have never believed it proper to assume the same percentage on the items for overhead charges, as these items vary so greatly in different properties. The description of the subject of overhead and incidental expenses is set forth in detail in Defts.' Ex. 15, pages 234, et seq. I feel that my judgment in the consideration of the definite items of overhead percentage is productive of greater certainty and accuracy than adding a flat percentage.

I added for Stores and Supplies: value new, $280,059; present value, $280,059. This was divided between states on the basis of track miles—82.9% to Michigan.

Those are taken as of June 30, 1912; we did not go back over a period of years, but simply found what was then on hand; they might have had more or less at a previous time.

The $100,000 for Working Capital was purely arbitrary, based on our opinion; this is a fair amount; they may have had $50,000, or $150,000.

718 (It is understood that the text of Defts.' Ex. 15 shall be treated and considered as the witness, Hansel's testimony.)

It is my judgment that on Oct. 1, 1912, the South Shore property in Michigan devoted to railroad use as a whole could have been constructed, the right of way being acquired and structures put there, for the figure stated as my value new (p. 4, Defts.' Ex. 15), $15,531,227, or less.

The present value of $12,596,114 represents my judgment of the present condition or value of the property on Oct. 1, 1912. The term "present value" is intended to convey the value new as de-

preciated by the elements *or* use or obsolescence, and has nothing to do with sale value; it might be the same or different.

In my opinion, the property would not be worth any more at any time in a period of three years preceding the date of the inventory, meaning the present condition or value.

As bearing on the item of Interest; it is the practice of railroads to hold back from the contractors generally 10% or 15% of the estimates. I cannot answer whether that would affect the item of interest; the contractor would consider that in his unit price, if he is wise. In fixing prices, e. g., grading, a contractor making a bid should, and does, so far as he is able, consider the contingencies which he is required to assume. The only place he can put them is in the unit prices. The prices he charges is the measure of what he is going to get out of it, including his profit; those prices include
719 everything, except contingencies by way of quantity, because quantities are developed as the work is done, consequently most contracts are based on unit price.

If South Shore were to be reconstructed in entirety, the amount of grading and work required would not be such as to produce any considerable increase in prices of labor or material; it would if it had to be done in six months time, but, under ordinary conditions of construction, taking, say, 2.5 years, it would not. Nothing was allowed in my unit prices for advancement of labor or material due to the demand from reproduction. On Indiana Harbor Railroad, where grading was approximately the same as South Shore, construction was completed in 9 months. I had no intimation that prices increased; the contractor took it at a fixed amount, and seemed to be satisfied with his contract; we had no trouble getting bidders there. I was the consulting engineer.

720 HANSEL.

Cross-examination.

By Mr. Butler:

Defts.' Ex. 15, Hansel, page 17, item 1, 6.3 acres: Riggs' value, $2,500 per acre. I reduced that valuation to $2,000, because of abandonment of certain developments going on at time of Riggs' appraisal, because there was no growth of the town that way, and because I considered $2,000 an acre a very fair price, higher than I would expect to purchase it for; I never bought land at Soo, nor did I ask any person other than Tombo about its value there.

My opinion was $2,500 an acre was high for that land. The improvement on tract 2, (Defts.' Ex. 18, Hansel) had been abandoned; they had taken up the track and were not doing any more filling, the idea being that if there was demand for that character of land the improvement would have been continued. There wasn't any evidence of any development or any demand for that land.

As to parcel 1, on Defts.' Ex. 15, priced at $2,000 per acre; if I had only made the trip to Soo, referred to, I would not be qualified to

give any opinion, but I have had occasion to value property in various states for various purposes. So far as I know, no person is qualified to say precisely what the value of land is for railroad use, especially at a terminal; so many elements enter into value that the value of land for the precise purpose for which it is to be put is entirely a matter of opinion, and cannot be proven. My figure is the estimate I would give a client, based upon knowledge acquired in many years of work.

721 I had before me the statement of Mr. Riggs, but, because the town was not growing in that direction and there was no demand, I would certainly expect to buy cheaper than his values; I saw the testimony taken in this case on the value of real estate at the Soo; I was influenced by everything that had bearing on value. I did not examine the testimony of the witnesses as a judge; I mean that I had the value fixed upon that by Mr. Riggs at the time that he fixed the value; I also had the value given in the testimony, I don't know who by, of various tracts of land in the vicinity, and I had my own observation of the character of the land and the fact that there was no development going on in that section; I considered the value given by me to be as high as I would expect to pay if I were to build the road.

Mr. Wykes: Mr. Hansel's testimony all through, I think, indicates that his investigation was rather superficial as to land values; that is, it is the judgment of a man of experience, not acquainted with the detail. I am going to produce the detail for you.

I understood that there were to be so-called experts on the land employed by the State and therefore I wasn't expected to go into it in the same manner by producing sale values and trying to

722 apply them, as if those experts were not to take up that subject, consequently, I put upon the land the values that I would expect to have to pay if I was called upon by the State or by an individual to give him an estimate of the cost of building that road, and I certainly feel that the investigation was sufficient for that purpose.

The area of the 100 foot strip, item 8, included in railroad use is about 2.5 acres; Deft.'s Ex. 15, Hansel, item 8, shows 3.4 acres at $1,000, or $3,400; that is the price for the land in 100 foot strip, in the triangle of the wye. I don't think the balance of triangle worth that per acre; I didn't estimate that; not included in railroad use, it would be worth under a thousand dollars an acre.

I formed an estimate of the lands inside the wye, in view of severance damages, which is higher than the whole tract; I should say $600 or $700 an acre for whole tract without the railroad on it as the highest estimate.

The remaining land is high priced farm property; that is all. It is not city or suburban property in any sense of development.

The value put on such portions of right of way and station grounds as shown in schedule were the values considering all elements I thought should be considered in acquirement; this includes expenses of acquirement and element of cost on account of forced purchase

and the fact that seller asks and gets a higher price because of the necessities of the railroad.

723 Generally, the railroad has to pay more for land than true value; sometimes it doesn't pay anything. The excess is sometimes as high as 200%, and sometimes more; I always had the cost of acquisition in mind.

I had the testimony taken with reference to values at Soo. I didn't give much weight to Stradley's value of $1,500 per acre, on item three, for ordinary purchase and sale. It didn't seem to me to be the testimony of a person whose judgment I would accept.

Deft.s' Ex. 19, Hansel, St. Ignace, 2400 ft. dock property, #16; Riggs' value, $10 per foot, $24,000; Hansel, $15 per foot, $36,000; that is just my opinion of the value. I saw Riggs' figures before I fixed my valuation at $15. Had no data except my examination, notes and experience. I presume we had all of the testimony at time we fixed that value; am not sure. I went over such testimony as was furnished me, spending 4 or 5 days going over it. I made memoranda as to this property on trip of Aug. 5, 1912. The shore front between the steamboat pier and ore docks seems to be of very small value, has shallow water, and there would probably be no demand for it for any purpose except it be the building of a pier or a dock, and no connection can be made with such pier or dock except by tracks in the street, or through the street.

I don't think I was influenced here by the testimony of Hoffman and others; I don't recall that feature of the testimony.

724 Deft.s' Ex. 20, Hansel, at Carp Furnace, South Shore crosses Carp river in northerly and southerly direction, being a mile from city limits of Marquette. The line follows the lake shore, and, generally, the land on the left or westerly side is fairly high ground up to the crossing of Carp river. On the north side of Carp River and east of the furnace, the line swings to the east over the highway and along east side for a considerable distance. The bluff northerly and southerly of Carp River and the configuration of the ground is such that a railroad approaching Marquette from east, to get a reasonably cheap location, must be close to lake.

That a railroad approaching from east must be between bluffs and the lake renders the property more valuable, because of necessity of use for railroad purposes, than if it were an open stretch of country; not only is the land more valuable for railroad purposes, but because owners would put a price upon it taking that into consideration. In valuing the road through Marquette, I attempted to take into consideration all of the elements which I thought would affect the property's value.

If you had to pay $100 per front foot for the land along the lake shore, valuable on account of riparian rights, I am not at all sure that it would be cheaper to acquire that land than it would be to attempt to go around to the city of Marquette from the east

725 through the hills or bluffs that I have referred to. I believe it would be cheaper and better to take the upland elevation; I would have to study that to be sure. If we were to assume a

reasonable price to be $35 per front foot for the land abutting on the water on which to construct the road between the lake and the bluffs, it would certainly be cheaper to go up on the hillside than to pay that price; I suppose to do this it would be necessary to go up onto the hillside as far out as the city line, in which case the distance would be 1.5 miles at $35 a foot; this would amount to $277,000.

You do not necessarily have to go around the bluff, but you would go on the side of it. I have not figured out at what point you would get down to the lake level; it would be ultimately necessary to get down there, but not of necessity with the main line. I might be higher up with my station in the city and come down to water front with a heavier grade; I presume we would have to come down the front to get to the water.

To get into the best part of Marquette would take 2 miles further, or 3.5 miles, which, at $35 per foot, would cost $470,000 for right of way.

I mean it is 3.5 miles from city line to Marquette station, according to mile posts. I decline to testify as to the difference between the cost of that and a railroad built on the bluff, because I don't
726 know until I survey it; it is my judgment that it would cost more to come in on the lake front, at $35 a front foot for riparian rights, than to go up on the bluff in some way. I am satisfied that, adding the cost of construction down there to the $35 a foot, you would have a higher figure than you could buy the right of way for, adding cost of construction, inland. At $35 a foot, right of way would cost $155,500 per mile, exclusive of other items; I have no idea that right of way inland would cost anything like that.

I don't know what railroad construction inland would cost; all I can say is that my opinion is that, at $35 a foot for the riparian ownership or rights, it would be cheaper to come in there. That is a fact I could only determine on actual survey. Ultimately you must come down from the hill to the lake shore, but not of necessity with the main track; I don't know how you would avoid coming to the lake shore with the main track and get into the heart of the city; I have not surveyed it. The question of relative cost is entirely speculation and guess work on my part; I have not been asked to prepare myself on that subject at all.

Item 31 (pp. 19-20, Defts.' Ex. 15), 1,100 feet water front: Riggs' value, $35 per foot; Hansel's value, $1 per foot. The railroad owned, but did not use, the water front; I didn't class it as railroad use, and gave it a nominal value. I found no riparian use of that property.

727 The only value I gave to the riparian use is value for piers or docks. I found that there was rock thrown down there to riprap the track and protect it from the water; I found the riprap in use and have given credit for that. If there had been any construction there out from the shore, I would have included it as railroad use. The riprap is not of that value; that value is beyond the riprap. Any value given for that purpose is beyond the riprap, under water. The $1 a foot is just a nominal value for railroad use. If you occupy all of land to water's edge, there is not a riparian use of the property.

Land is often bought for use as upland, without buying the riparian rights; you can put a building on it without destroying the riparian rights, or sell it to somebody else to put a dock on, giving right of way over the land to get off the dock, in this case over or under the railroad track. That is often done. It is no good to you unless you want to put a pier on it; that is often done; you hadn't devoted the riparian rights to railroad use.

I don't think you have turned the entire property to use. I can cite many cases where they buy to the shore and do not own the riparian rights at all; it is often the case. I think we found riprapping at that place, and that it had been necessary to riprap other land each side of that, to protect the track. I undertook to separate the land from the appurtenant riparian rights, and to value it in that way; I frequently do that in valuation. Often, they do not own the
728 riparian rights at all, because it costs too much for the purpose of upland. I don't know, but I should say that 1,100 feet strip is 50 or 60 feet wide. I would suppose that that could be bought without compensation for riparian rights; if I was the railroad I wouldn't buy the riparian rights there.

It is my judgment that for $1 a foot I could buy that 50 or 60 foot strip of land 1,100 feet long, and separate it from its riparian rights. There is no valuable use of the riparian rights other than putting structures on them; I can imagine a person might want a dwelling above it with his view unobstructed by docks or railroad sites. The property is platted up to the street adjoining that strip. That is easy to do, of course; that don't give it value, just to plat it. I believe you could purchase that 1,100 feet for $1 a foot, because there is no apparent demand for it other than for railroad use, as now used. I believe I was furnished the testimony of Asire and Robertson.

Along this 1,100 foot strip, the railroad, in a sense, damages the surrounding property.

I was not asked to determine the cost of it at the time of location of the railroad. In getting production cost of the land, I assumed the existence of the railroad; I proceeded to value that piece of land under the conditions existing today, showing there was no demand for the frontage for any purpose. When called upon to get reproduction value of railroad property, you must not take into consideration damage that was done residential property in its acquire-
729 ment. You take it as the conditions exist today; it has been damaged from some cause or other; the value of it is as it is.

We allow nothing for severence damages in our estimate, because, on the other hand, where it has appreciated beyond the cost of the land at the time it was purchased, we gave credit for that unearned increment. We didn't consider what it cost when they built it; that was not our problem.

I didn't consider the value of the adjoining property at the time they built the railroad; that property may have been higher in value at the time they built the railroad than it is today. On the other hand, in some other case, the unearned increment has increased the value of the land over and above what it cost to build, in which case

we considered the increase or the conditions that obtained at the time of the survey.

In taking the parcels I considered them as irregular parcels and of the shape in which they would be required, as purchased. I took the several parcels as owned by the railroad and endeavored to fix a value as of October, 1912, taking into consideration all elements.

Understand, if the Court please, that all of this whole thing is suppositious, at the best; it is hypothetical, and because of those elements it is necessary to exercise your judgment as to all the elements of cost that would come into the acquisition of the land at the time you are considering it, and to say just exactly what weight was given,
730 or if any weight was given to any particular item, in all of the cases, or in any particular case, I am unable to say.

The Master: According to what you have just said, you did take into consideration abuttal damages, if you took any of the elements that would enter into it.

A. I endeavored to.

The $1 per foot is based upon my opinion, the opinion being based on experience and conditions and the evident fact that there was no demand for that frontage other than for railroad purposes. There is not a dock anywhere south of the city, except the Standard Oil pier. There isn't a pleasure boat anchored anywhere, or any evidence of any desire to use the land. Had there been piers—even small ones—owned by the owners of the upland, to get to that water for pleasure or business, I would have considered that, but there is absolutely no occupancy and no apparent object in using that portion of the bay.

I cannot give a supporting figure for the $1; it is simply a matter of opinion, based upon my experience. I could find no evidence that this property had any riparian value. In my valuation I don't consider whether there was any value to the riparian rights; I have never, until today, seriously considered the value of the riparian rights.

Q. And yet you answered the Master today that, because you couldn't see any docks or pleasure boats, it didn't have any value?

A. Well, I wasn't discussing that particular situation, but
731 all of this, I said, if you please, the whole frontage south of the oil pier there was unoccupied, and I did not consider that any of it had any particular value for the purposes of riparian rights, and I still say that it is not used by the railroad in any sense of railroad use.

I've valued riparian rights and upland in property on p. 18*a*, Defts.' Ex. 15, Hansel, reaching a value of $53,750, as against previous value of $62,500.

I think my item 33 is the same as Riggs' second item, 2,200 feet inside Marquette harbor.

Our valuation is divided differently; the value of approaches for ore docks 4 and 5 is my opinion, taking conditions as I found them; I have had experience elsewhere and considered the conditions and the development or undevelopment of the harbor, 100 feet of the dock approach is on east side of Lake St. For the purpose of dock approach, I could see no difference between east and west sides of street, and fixed a price for any purpose of $25 a foot.

Q. Did you in any way consider severance damages?

A. I attempted to consider all the elements affecting value, considering the ownership of the adjoining lands had an *affect* on value.

Item 34, Defts.' Ex. 15, frontage west side Lake St., north line Ely lot to Jackson St., 1,000 feet; valued $30 a foot; it is of greater value than the item under 33, of 100 feet just referred to. The
732 value of $30 was my opinion, considering the size and depth of the plat and the conditions; all the values were made on my opinion. I inquired of no outsider as to the value or sale prices of real estate in Marquette.

The only information I had was the evidence in this case and my personal opinion after going over the entire situation. I examined each parcel, and, so far as I was able, made comparisons of the cost of acquisition, having all the elements in mind that I could bring to bear on the subject. I considered all the testimony I had before me, and judged partly from that and partly from my own observation, I presume.

Item 34, p. 20 Defts.' Ex. 15, frontage west side Lake St., north line Ely lot to Baraga Ave., $15 per foot. Rejected Riggs' value of $30, because the configuration of ground depreciated the value; the ground rises very abruptly, and must be excavated to be occupied for any purpose. It would not be considered for the purpose of residences.

In reducing the value of Riggs', Asire and Robertson 50% on this I endeavored to carry out the sense of proportion between values, meaning to consider the depths, availability, and all the elements that go to make up the value of a tract; some of the land is valuable because of its use for a variety of purposes, and at other points there are fewer purposes for which it could be used, therefore there is a proportion between the two, in the variety of applications of industries or other earning organizations. On 34*a*, there is a very shallow frontage. The upper end is used for a park; there
733 would be a very small demand for that tract for anything but railroad purposes.

All of the land is for railroad purposes; I don't estimate the value for that purpose. All the land occupied is valuable for some purpose; to take out a part of the track would destroy the continuity of the rails, consequently one foot is just as valuable for some purposes as any other foot. Where there is a narrow strip of land between a high bluff and just room enough for a yard, with no other land in the vicinity that can be put to use as a yard, that land has a special value for railroad purposes; I never gave it such value, because it cannot be estimated by anybody that I know of, e. g. there is no price railroad terminals could afford to accept, if continuing in business.

If they were deprived of their terminals and could not acquire others, there is no price they could accept if they expected to continue in business; there are very few pieces of land that I could estimate in dollars and cents as value to the railroad. In some cases they would vary the route, and in others they could not, that gives the latter a special value, which I cannot estimate in dollars and

cents. Yes, I think I can go into Marquette and estimate the value of property, without finding the holding or sales value. I cannot, however, estimate in money the special value for railroad use. I can see a difference in the value to the railroad and the value of the land.

Q. Is there none of this land that had a special value, this land along that lake front, because it was the only desirable practi-
734 cal route into the city of Marquette, and very limited in extent, so that the owner would be justified in charging higher price for it than he would where there was a vast quantity of it, and the railroad would have to pay a higher price?

A. I think we have considered those elements.

Q. You have considered all of these elements?

A. In all this valuation.

Item 35, Defts.' Ex. 15, frontage west side Lake St., Jackson to Mesnard, 565 feet, value by plaintiff's witnesses, $20 per foot, by Hansel $10; that is my judgment of the value.

Item 36, Defts.' Ex. 15, frontage west side Lake St., South of Hampton St., 170 feet. In valuing this, I applied same considerations as to all other places.

Item 37, 46 50-foot lots, between Mesnard and Hampton Sts., present a problem of valuing city property. I estimated the value by the surrounding conditions, and evidences of development or lack of demand, whichever seemed to exist. I spent more than 2.5 days' time in Marquette, and, besides that, had evidence through my assistants, through the testimony, and the observation of the ground; in that valuation I was somewhat influenced by the testimony. I fixed those values myself, in consultation with my assistants.

Item 38, 12 50-foot lots; $200 was my estimate of the value of that group.

735 Item 41, frontage on Front St., Baraga to Washington St., depot grounds, 343 feet; the Front St. end of the 40 feet thoroughfare is also here rejected, leaving 303 feet. For the remaining 303 feet, my value of $400 per foot is my opinion, after studying all the conditions and data and such evidence as I had.

Item 42, 184 feet frontage on Front St., south of Baraga; I based my opinion there upon the character of the ground, the buildings opposite and the conditions surrounding; it was my judgment, based on my knowledge of the location, together with such use as I made of the Riggs' valuation and the testimony of witnesses furnished me.

Item 44, 14,000 sq. feet in Alley east of Third St. Riggs' valued 14,608 sq. feet. Our areas were checked. I fixed price and arrived at it in the same manner as the last preceding. Also valued all property frontage on business streets and where lots are involved in the same way.

In reducing Riggs' price on 14,000 feet from $2 to $1.50 per square foot, I have no recollection of the reasons, except the configuration of the piece, it being an alley, influenced me in placing $1.50, which is fairly high; I did that in spite of all testimony. That is a situation that is entirely a matter of opinion; it is an alley, back of lots fronting on Washington and Main Sts.; there is no sale value

for that kind of property, and no demand for it except for railroad purposes.

736 You could only determine what the owners on Washington St. would be willing to buy at from an actual offer. To get at a precise value we would have to assume that railroad was not there, that town was same size, that there was demand for the property on each side, and then go to each owner and find out exactly what he would sell for. If it were attached to the rear of lots on Washington St. I should expect, on condemnation for railroad purposes, to get it at the price fixed; $1.50 a square foot is no small sum of money.

Item 45, Defts.' Ex. 15, equivalent of Riggs' 100 foot frontage on Baraga Ave.

Item 46, equivalent of Riggs' 150 foot frontage on Spring St.

Item 47, Third to Fifth Sts., 3.5 acres, at $3,000 per acre; the same as Riggs' 21 lots Third to Fifth Sts.

Item 48, Fifth to Park Sts., shop grounds, 15.5 acres at $2,000 an acre, is same as Riggs' 60 lots, shop grounds, Fifth to Park Sts., $500 per lot; agreed with Riggs on latter two items, on same theory that in other cases I could not agree with him, basing my values upon conditions and investigation.

Item 49, corresponds with Riggs' 34 and 36 acre tracts south and west of Nester's Add.

As to Riggs', Robertson's and Asire's value of the tracts aggregating 70 acres at $900 and $1,000, I felt that if I was correct in throwing out the considerable area on account of non-railroad use, I

737 could not consider any estimate on the whole. I didn't come to the conclusion that the whole was worth more than they fixed on it; for railroad uses, the excluded area between the tracks would be worth as much as the land that had tracks on it. It would not be valueless for other uses; it would be an excellent place for an industry, if there was any demand. The piece on the south is more desirable for dwellings than for any other use; it is hardly accessible to the railroad, and is good high ground, suitable for cheap dwellings. The existence of the yard parallel to, and within 200 feet of, Washington St. lessens value of land there for high class dwellings.

Item 52, north line right of way to city limits of Marquette, 6.8 acres, $200 per acre; this is my opinion of the value.

Item 54, south line right of way south of Division St., to north line S. W. ¼, of S. W. ¼, Sec. 26. 4.1 acres as against Riggs' 16 acres; our value ($200) is the same as Riggs' for the acres included. Our value includes nothing but the 100 foot strip.

We didn't adopt Riggs' value; I didn't disagree with him, because I didn't consider the whole area, but only what we were appraising.

(Strip, about 1,400 feet, from No. 54, on Ex. 20, to platted portion of city, omitted from Hansel valuation; it is something between 3 and 4 acres.)

738 Item 55, 96.4 acres: the value on that strip of land varied; I estimated the average at $75. We were over that part of the line on other occasions than our first trip. The character of

the land is easily observable, whether tillable or timber, underbrush or swamp; it is easy to see from the end of a train, oftentimes easier. Land untillable in present condition, lying close to a town of 13,000 people, may have a value beyond that of tillable land further away. This is between Marquette, Eagle Mills and Negaunee. The notes indicate this is on the side hill, not suitable for farming, and very cheap charactetr of land; I consider $75 an acre high for it.

Item 53, north line of city limits of Marquette to mile post 163; 90.3 acres, as against Riggs' 79 acres.

Item 56, north line from mile post 163 to mile post 164 plus, 4200 feet, and south line, mile post 9 to mile post 3, acreage 86.5, divided into two tracts, one 46.5 acres and another 40 acres. (Witness indicated division between these two tracts, one being at $1000 and the other at $3,000 per acre by pencil line on Defts.' Ex. 21, Hansel.) The division is approximate, as it could not be absolutely correct; we could not go a certain distance with an acre at $1,000, and then suddenly change to a value of $3,000 an acre. The intention was to separate the potential ore values from the developed and operated ore values; the line is somewhat of an imaginary division between the two qualities of land, but generally shows the division. I am putting the black line on from
739 memory of the situation.

I instructed Mr. Tombo to get together all the information he could on the subject of these land values, after which we consulted together, and I determined that that would be a fair division between the developed and undeveloped ore bodies; to determine that with any accuracy would require surveys of the ore bodies, which I did not do. In giving these values I considered how much I could get into that territory for, in the same general location, if I could get in at all. It might be that, with value of the land as held by the owners, it would be absolutely prohibitive to build a railroad in there.

It would depend greatly upon the attitude of the owners of the land, which I could not determine; if they had to pay over $3,000, it would cause great hesitancy in building there at all.

There are so many conditions affecting value there that I don't understand myself, I frankly say it, that I haven't found a definite explanation of, nor have I seen any condemnation proceedings or court proceedings on this area that we have under consideration, that it was in my mind a matter of judgment as to the value or the amount we would have to pay for the surface; I didn't attempt to estimate the value of the ore underneath at all.

I determined it to the best of my ability; spent but a short time on this investigation personally, probably not more than a day on the ground, and going and coming. We stopped at Negaunee and Ishpeming, went slowly over the roadbed, and over the sta-
740 tion grounds; was not on old line at all, but could see it full of cars, and got a general view of the surface; didn't attempt any estimate of values under ground, but I had all the information available at the time.

I didn't intend to say that anything above $3,000 would be prohibitive, but that it is quite possible that the conditions of ownership could be such that the price you would have to pay would be prohibitive. We had the testimony of Mr. Riggs and I saw testimony giving results of condemnation proceedings in the immediate vicinity. I observed that Belden and Young put a higher value than Riggs, and supported their judgment by accounts of actual purchases and sales. I don't recall having before me the prices actually paid for the new line, 2.6 miles; I presume that we did. I don't think it would be right to value the land at less than cost to the railroad, unless they had intentionally paid more than they could have gotten it for.

I think if a piece of property is purchased in good faith, and with reasonable intelligence, as I presume this piece was, that the company would be perfectly justified in carrying it in its assets at what it cost them, but, as a general principle, I think we should hesitate to formulate any theory on the subject, because conditions may change very quickly, and, if you care to have me, I will illustrate.

I cannot give the name of any person of whom I or my assistant inquired about these values. My assistant expressed an opin-
741 ion as to these values to me; I always ask. I cannot say whether I adopted his opinion or my own; if I had formed an opinion in advance, there would not be any object in consulting. The conclusions I came to are my own.

Item 57, Riggs, $3,500 per acre; Hansel, $4,000. I think Riggs' figures were as accurate as could be determined under all conflicting conditions, and, because of elimination of a certain area further from center of Negaunee, the balance would be at a higher average per acre. Having adopted Riggs' basic value of $3,500, the rejection of 5 acres induced a higher average value for the balance, because portions of it would be nearer the heart of the city. I gave the testimony of Belden such consideration as I thought it worth.

Item 58, N. line, from mile post 167, 8,700 feet west, within limits Negaunee and Ishpeming, right of way for single track, considered equivalent to a width of 50 feet. This item corresponds to Riggs' item of track rights Negaunee, main line 8,700 feet. On an assumed width of 50 feet, part of this description valued at $4,000 and part at $3,000, producing a value of $34,000, against Riggs' $43,500.

Item 59, Teal Lake branch to Negaunee, 7,300 feet; Riggs' value adopted.

Item 60, track rights, Palmer branch to Milwaukee mine, 9,200 feet, valued at $1.50 per lineal foot.

Item 61, S. line in Ishpeming and Negaunee, mile post 167 W. to center line, Sec. 11, Riggs valued 12.77 acres at $1,000
742 per acre; I valued 12.4 acres at $3,000 per acre, on the theory of $3,000 per acre in developed mineral territory; we believed it such and so increased it to be consistent.

Item 62, 38.3 acres; 8.3 acres from west end of item or Ishpeming limits at $1,000 per acre, and balance, 30 acres east toward Ishpem-

ing and Negaunee, at $3,000 per acre; arrived at this in the same way as other mining values.

Item 63, 9.6 acres, at $3,000; Riggs' valued 9 acres at $3,000.

Item 65, 7 acres at $3,000; Riggs' value, $3,500. Arrived at value on same theory as other developed mineral lands, giving same value to all land where we believed mineral might be said to exist, except where we were higher on account of the added value in the city. Where mineral value was the only element, $3,000 was our limit; $1,000 was where there was a lesser possibility of iron ore.

Item 64, 5000 feet in Ishpeming, N. line of Sec. 10, to center of line Sec. 9, $3,000 feet at $30 and 2,000 feet at $5; Riggs valued entire at $30; I made distinction in price because I considered east end to be of higher value; the 3,000 feet ends between sections 9 and 10. I took into consideration all elements including minerals and gave a value to the 3,000 feet, because of possibility of land being underlaid with iron ore.

Under 2,000 feet possibility of iron ore also; the east end was of higher value on surface, being in more valuable quarter of Ishpeming and not because of greater mineral rights.

743 Item 68, Mary Charlotte Branch; Hansel 3 acres, value $100; Riggs 3.2. This appeared to be in active mining district. Values subsequently increased to $2,000 per acre. Portion of Palmer Branch also appeared to be in active and potential mining district. (Value subsequently changed to $2,000 an acre.) On consultation with my assistant I fixed values on Michigamme, Republic and Champion station grounds and on Champion mine branch. At Humboldt, I allowed 4 acres at $100.

I remember the 1,500 feet of water front at Houghton. South Shore road goes into Houghton on the best line and easiest entrance from east; and it must have yards and terminals on water front. If riparian rights in use, it would be worth more than I have fixed. All of the land along the 1,500 feet is in use; I excluded part of its value in appurtenant riparian rights and I have excluded riparian rights for the reason alone that they have not been developed into railroad use or any other use. It could be sold or occupied by others under lease to bring in an income, it has not been so done. You are not using the riparian property, which is a mere right attaching to the land because of its location.

You are using all of the fast land, but not that under water, which you have the right to use. I almost always, in my experience, separate the value of the land under water from the value of the fast land; it is generally separated. The upland, fast land was necessary for railroad use; frequently that land is bought separate from its riparian rights. I don't know what you could have done there; it is the rule, rather than the exception, where the values are high.

744 In a sense, I have not allowed the value of mineral rights, because, if I had, we might have gone to such a sum as to be prohibitive; I don't know what the mineral values are. I think the cost of the getting onto the surface would be enhanced, because of the value of the mineral underneath. With the riparian rights, you still have them, you own them. In the other case, you don't

buy them. I don't assume the responsibility of a basic figure used by me for right of way, but do for the multiplier of 2.

The population figures in Defts.' Ex. 15, were taken from 1910 census; Baraga, 100 (p. 10) is probably a misprint for 1000. The term "present worth", as used on page 5, defts.' Ex. 15 means a reproduction cost of the segregated items new, less a percentage to represent present condition, but not commercial nor fair taxable or sale value.

As far as I was engaged in the problem, it was to ascertain a correct inventory of the parts, including lands, structures and equipment, not including intangible value, cost of developing business, or cost as a going concern, or franchise or good will value. My results do not purport to give any opinion of fair value of the property as a whole for use as a transportation machine in production of ton and passenger miles.

In my profession, there has grown up in recent years, especially since the Michigan appraisal of 1900, a quite well established
745 practice of getting at reproduction cost; much has been done toward accomplishing the definition of value applied to various conditions for various purposes. Some things are now reasonably settled which were then subject to further consideration, doubt and dispute, but many problems remain about which there is difference of opinion in my profession, and among economists, publicists and lawyers. Most of the differences are referable to the underlying conception of "value", the particular definition for that term as applied to the particular purpose of the valuation.

The value of the use of an instrumentality for the performance of its function, may be, and frequently is, very much more than its sale value or its taxable value. It may be either below or above.

The terms "present worth", "present value", and the like, are indefinitive. We must consider the matters heretofore refer-ed to in this cross examination to properly weigh the value of any reproduction figure, however accurately made. Usually, and generally speaking, the value of the use of a thing for the performance of the function for which it is created is greater than its second-hand value. That would be true of locomotives, cars and movables on railroads generally, except that there are periods of depression and of affluence which affect conditions, depending largely on the period of time through which it has been operated and accumulated friendships, interchange of business and contracts of advantage.
746 As an instrument of commerce, a railroad well located and built in obedience to a reasonable public demand, economically constructed and properly maintained, is usually worth more than the cost of its parts new.

It is possible to conceive of situations where the reproduction new cost might exceed its fair value; want of necessity, or want of economy in building, might show the other side of that truth. In seeking to establish a reproduction cost new, the first conception indulged is, that the property to be appraised does not exist as a railroad or part of a railroad, but has existed, and that it is to be created, replaced or reproduced; that is, that the right of way

is unimproved for railway purposes, but that the community, contiguous lands and properties are in precisely the same condition as now. The change conceived is the obliteration of the railroad, except that the land is presumed to be in the same condition and devoted to the same uses as the abutting land.

Further on the same subject indicating that in the problem the land is to be treated as being of the same character and condition as the adjacent areas are at present.

Original cost or condition of right of way is ignored in getting at reproduction new, figure.

Generally speaking, the conception is that the particular property, of the same general design in its lands, improvements and moveable parts, is to be reproduced, except that, if an equal or better design can be constructed at smaller cost, it should be so considered.

747 That principal I applied sparingly; it should be applied with great care, to avoid speculation and conjecture. The grades, curvature, alignment, rolling stock and structures were taken as they are, as a rule.

After organization of corporation, the first thing to be thought of is, where you will get the money to build; in reproduction problems, that ought to be thought of—how much you will need, how you will get it, and what you will have to pay for it. It is proper to take into account fair and reasonable cost of financing, in getting reproduction figure.

That includes interest on idle money during construction, which is a proper charge. It is now well settled in my profession that whatever would have to be reasonably paid ought to be allowed in this kind of an estimate of reproduction cost. The amounts to be paid depend upon the prospects of the company, condition of money market, etc., but the prospects of the property would be principal factor. The prospects are shown more accurately under the conditions we are trying to act under than they showed at the time of the conception of the scheme.

The element of certainty of success would tend to decrease the cost of money; a certainty of failure, more or less well grounded, would prohibit the enterprise. I assumed that if the property here was to be bonded at 5%, bonds could be sold on 6% basis. I assumed that the money could be borrowed and that the railroad was going to be built.

748 I didn't review the history of the past, or undertake to form an opinion as to whether it could get money on a 6% basis or at all. I assumed that if it could not get it at 6% it could not get it.

Q. Now let us assume a railroad in any part of the western country, with the mileage and trackage that this has, or assume the prospectus of the creation of one that would cost $15,500,000, that is about your reproduction new figure, and an annual interest charge of $913,700, and assume further that in 25 years of its history it never earned that much, or could not, its net earnings never amounted to the interest, and that of recent years it averaged about $500,000; on that as-

sumption, and for general application, you would not say that the money needed to produce or reproduce it, could not be obtained.

A. If a property to cost $15,000,000 was shown to earn only $500,000, I doubt if there would be any possibility of financing it at any rate of interest; for the further reason, that the earnings estimated are insufficient to support the capital, and the estimated earnings are generally as high as the imagination of the promotors can fix them, and the financiers generally underestimate the income rather than overestimate it.

On property like South Shore, with mileage planned, and prospect of earning less than an interest charge of $900,000 annually, you could not obtain the money on such a prospectus at 6%. In some cases, there is a value, to other properties which it joins, or which operate it, that would make it desirable to construct and oper-
749 ate at a loss. That was not the consideration of my reproduction estimate, which was that it would be built as an independent property and that the ordinary interest charge which would warrant its being built as an independent property, would not exceed a 6% basis. To get the money at 6%, its prospective earnings should be twice its interest, that is $1,800,000 per annum above operating expenses and taxes.

Assuming the South Shore road in Michigan, well located and maintained and economically operated, and built in obedience to a reasonable public demand, and that its net earnings, after operating expenses and taxes, for a score of years, has averaged less than $900,000 per year, in my opinion its earnings are too low, either from want of business or low rates. The description of territory (pp. 10-15, of Deft.s' Ex. 15) would indicate that there must be relatively little interstate passenger traffic on lines of South Shore in Michigan, as compared with railroads of New Jersey, Southern Michigan, and Michigan as a whole. (Subject to objection that the answer involves an examination of traffic conditions, which witness has not made.) Had I been studying the possibilities of business on the line, I should have gone into the question of what traffic was probably tributary to the line. I have only indicated the character of the villages and hamlets, and given the population in the various counties, to indicate the density of settlements as affecting the
750 value of the land to be acquired.

If the population indicated on Deft.s' Ex. 15, (pp. 10-15) included all people naturally tributary to the line, there would be a sparse passenger traffic. The haul would be short, though that is often an advantage; the haul would be greater per inhabitant than in a densely populated section. Upon a prospectus describing that territory and this property with a 2¢ passenger rate, I would not loan $15,000,000 at 5%, if it were only to haul passengers; I would not advocate such a loan with freight and interstate passenger business, the total of which never amounted to the interest at $900,000 a year on the average.

Q. Would you not also think that on those conditions which I have assumed in that question, supplemented by what you observed, two cents per mile for adult passengers is too low in that territory to

justify the creation of that property or to make it possible to create it on the hypothesis that you could borrow and get fifteen and a half millions at six per cent?

Mr. Wykes: I renew all the objections previously made.

A. I understand the question, and in answer I will say that I have not studied the amount of business; in some sections people travel oftener than other sections, and I don't think I have sufficient facts either to accept—to advocate or turn down such a proposition; I don't think I have had enough facts before me to answer either way.

751 Assuming that this property has not averaged for 20 years, over taxes and operating expenses, the interest charge of $900,000 per year, and assuming my description of the territory to be true, 2¢ passenger rates would not enable the borrowing of money to reproduce the property, if that was all the business of the company. Assuming that was not all the business, but that the total business on the average for 20 years would not pay the interest charge, the case being entirely suppositious; I don't think you could get the money.

Any project that had to bear a heavier interest charge than 6% could not be prosecuted. If the charges on that property have not for 10 years averaged enough to pay the interest charge, which I have assumed to be necessary, as low as 6% (the case being suppositious) the charges or aggregate net earnings are such that such a piece of railroad, with contemplated or assured earnings which were below 6% could not be financed.

To procure the money on 6% basis, the earnings in prospect ought to be twice the interest charge; if they were less than that, I don't think the money could be obtained. I don't think that, unless by a fair and reasonable prospect it appeared that a property such as this would earn net above the operating expenses and taxes $1,800,000 per year on the average, taking good and bad together, the money could be procured to built it.

752 A schedule of rates which, taken on the average in good times and bad, does not give reasonable assurance of net earnings of twice the interest charge or reproduction cost new at 6% are too low, in my opinion. The trend of feeling is that way; on going concerns that can borrow below 4%, I have considered that an annuity of 5.5% and taxes should be allowed before intangible value would be considered.

If we didn't believe the earnings could exceed $500,000 average, I feel that on such a statement it could not be financed without more business or higher rates, or both. On 5% bonds selling at 85, $15,000,000 of money would be raised by about $18,000,000 par value of bonds; this would require a 40 or 50 year bond. It is easier to sell a 5% bond on a 6% basis than a 6% bond at par.

After determining interest rate, we must determine length of time required to reproduce the plant. This is a matter of judgment, and, in some cases, of great difficulty. Frequently, the interest at half the rate for the full time is estimated as necessary; that is the general

practice of the past. I have analyzed it more closely, and taken it item by item and calculated the time that the money would be used, in the belief that the practice has been far from accurate.

I did not apply any supposed net earnings during construction to interest account, but figured that when portions of the line are finished the interest charge would cease. Operation of a part during construction would be attended with greater overhead and administration charge on a few miles than on many.

753 I don't think the operation of a considerable division of the road when completed would render the carrying of business on the completed part more expensive, or hinder the construction operations. The completion of the road enables the company to earn from outside business and to handle its own materials better than if it had to carry it by an inferior transportation facility. In any particular reconstruction problem, it is assumed that company will handle its own material over completed parts, but they do not carry it free of charge. To carry passengers and freight to intermediate points contemporaneously with the haul of that material could not be attended with greater cost than if the road were completed, because the demand of the public for service would not equal the capacity of the road. They could not expect to handle or secure as much business in the beginning as ultimately.

Ultimately you would get the cost from it or more, depending on volume and conditions of operation. I think it was not proper to subtract anything from interest charge on account of the earnings from a part during the 2.5 years I assumed necessary; each particular property presents its own problem. Interest should be allowed on the overhead items which occur; if incidental expenses don't occur, that is an over-calculation of interest charge.

A variation of allowance for interest analyzed on my basis would occur between appraisers of equal capacity and character on account of the differences of time and of rate charged. It is conceiva-

754 ble that discounts, commissions and interest might substantially exceed 6%, but a going concern in many cases can get money at 4% at par today; e. g. Pennsylvania Railroad. I think it would be absurd to calculate the interest here on that theory.

To get at the cost of obtaining right of way, you would have to deal with individual owners; you assume the right of way runs through their land and severs it. The meaning of severance damages is understood; we took it into account in making this appraisal. The depreciation of abutting lands not taken is always involved in the cost of acquisition; that amount is difficult of ascertainment, as in some cases the railroad appreciates and in other cases depreciates value in estimate of owners.

Straight through a 40 acre tract (Government survey), a 100 foot right of way would equal 3 acres. The amount of damage to that 40 would be affected by the manner of crossing it, its topography and the location of streams and highways; each tract presents its own problem in getting at the severance damages. It might in many cases be cheaper to buy the whole lot, this is frequently done, and is good business.

The value of the use of the land in a street is, I think, just as great as if the fee title was in the railroad company; in getting at reproduction cost I didn't give it any value, I didn't allow anything for the land or rights in it. Where revocable rights, not likely to be revoked, are used, they have a value, to include which would be speculation, though perhaps it ought to be taken into consideration.

755 Page 18*a*, Defts.' Ex. 15, Hansel's assumption was the track was wholly within street, and no value for right of way there was used; if third party owned yellow strip between Lake St. and the lake, damages would have to be paid for cutting off his street front if they existed; it may be an advantage, ordinarily it would be a damage.

If it developed that buildings not requiring railroad facilities were there, there would be considerable abutting damages. Usually, a railroad running within 10 feet of the shore line would enhance the value; there is no rule. In many cities, it would appreciate the value if they could have a railroad along the water's edge. In case one owner owned a large tract along the shore line of a harbor, it would depend on the shape of the ground and depth of water as to whether he would be damaged or benefited.

If the riparian rights, when the railroad came, were of great value to the owner of all the shore on the harbor, and the railroad took all the land, the riparian rights would not of necessity be impaired; they might be materially enhanced. Whether I would allow for damages to the riparian rights, I would have to decide; there is no precedent for that. If there was damage, I would certainly allow it.

I considered that all cost to acquire certain tracts would be as shown in the schedule. Where the railroad company was not using riparian rights, I allowed nothing for them, meaning I did not itemize or schedule them as an asset or cost of construction; that is my uniform rule.

756 In the appraisal of all right of way, including Houghton station, I included damages, if in my judgment there was any damage. To take all the fast land of the 1,500 feet on Portage Lake at Houghton would probably impair the value of the riparian rights, and to that extent it ought to be allowed; had that been developed, I believe it should have had a much greater value than Riggs gave.

The value of use, by carrier, of land in vacated streets and donated lands is as great as though paid for. In prospectus to get the money I would not say property was of less value because using vacated streets; this involves definition of value, whether cost, use or sale value. The cost value is less, due to things not paid for, but not the useable or sales values.

There is a good deal of uncertainty in getting at the amounts of legal expenses in a reproduction problem. They cannot be inventoried; they can only be appraised. By reason of this uncertainty, I added a contingency of 10%. The same is true of organization, administration and interest, to which I have added a contingency.

The expression "contingency," as used in this schedule can be defined as covering uncertain items that may or may not arise. There has been much discussion about the allowance of anything for contingencies. If the contingencies arising are properly allowed, the

amount charged is just as much of an investment in the property as anything else. In such an estimate as this, they are absolutely essential, and it is as legitimate as the item for locomotive engines.

757 The contingency item, in estimating an existing property, differs from that where property is not constructed, but there are contingencies in all cases which I think should be provided for. The percentage is variable with the cost of the elements to which applied. It is now the practically well settled practice of my profession to allow contingencies, and there is no doubt about its propriety in my profession. The percent has to be determined with each particular condition.

The correct definition of the things which justify this allowance is: "uncertainty," "unknown conditions," "those which have not been, and cannot reasonably be ascertained or foreseen."

Upon such an inspection as was made by me on South Shore property, it is difficult to ascertain, without soundings, the yardage actually hauled onto some of the places; in those cases we gave 100% more than was shown on the surface. Ascertaining by measurement, the quantity might be increased or diminished; in such cases the quantity was small. It could only be determined by doing the work; the profile is not reliable, mathematically, because the earth may sink away. I would not say that the measurement quantities are always more rather than less, my instructions have always been that the excess of quantity is always given over that which would appear in the prism of a profile, or even the prism as found on the ground. In case of a yard in existence 50 or 75 years, there is no way of determining what the surface of that yard was before filled in.

758 The yardage in an old road cannot be found precisely, and one reason is you cannot tell how much has sunk into the surface. The density of the embankment increases with time; that could not be produced except by time. Engineers allow for the settling of the surface under the weight, including that settlement in the prism by requiring a certain percentage of elevation to be put in the bank over what is ultimately expected to be there. That percentage is understood to cover shrinkage and settlement.

An old roadbed is cheaper to maintain and worth more to use from every point of view than a new one. It is recognized uniformly, the world over, by railroad engineers that the roadbed appreciates in value with the lapse of time and reasonable maintenance.

Assuming that a road bed was new at X number of yards, that after being properly maintained for a quarter of a century it still had X number of yards, but in the meantime had become solidified, stable and steadfast, vegetation had grown upon its banks, the slopes of the cuts had become fixed, the road had ceased to settle, slide or sink, it is worth more and is a better tool of operation.

By adding a percentage to the actual quantity that is estimated you can, as far as intelligence will permit, cover that item by yardage, but not in stability. The knitting together, in steadfastness, is one thing, yardage is another. You cannot produce the former except during the same period of time and under the same conditions. Nothing was allowed for that appreciation, except in an increase of quantities. The appreciation would be shown in the commer-

759 cial value of the road. Nothing was allowed in my figure to show the value or quality of solidity of the bank.

Railroad men recognize that the old roadbed, reasonably well maintained, is of much greater value than a new one of the same kind. That can be gotten at by the difference in cost of upkeep. Safety, dust, comfort and use would all be elements; I do not know how to estimate that. A new roadbed is more apt to wash out than an old one, accidents are apt to happen from cloud bursts or heavy rains and the cost of maintenance is less in the old road. Speaking generally, there is a very large appreciation of value in the roadbed, due to proper maintenance and lapse of time, which cannot be reflected in a reproduction new estimate. This road bed is a more economical and safer operating tool than a new one. The extent of that I did not estimate.

Mr. Wykes: It doesn't involve any expenditure, you don't claim that it involves any expenditure other than would be reflected in the cost of reproduction, as Mr. Hansel has fixed it.

Mr. Butler: I am one of those fellows that thinks that the thing that I have got is of the same value, whether it involved expenditure or not.

Mr. Wykes: I am not questioning you on that.

Mr. Eldredge: I shall never give you a present because you will never appreciate it unless you paid for it.

760 In work done by contract, the contractor estimates a profit and assumes the liability for contingencies. Unit prices here are based on contract work; I didn't base them on actual cost. Loss by storms and weather are included in the unit prices. The percentage added for contingency is intended to include all contingencies of every kind whatsoever. My contingencies do not allow for damages by a heavy rain before road completed by contractor and turned over.

I cannot say how much I allowed for contingencies for grading in unit prices; unit price was intended to cover the cost of that work, including the contractor's profit. The experience in fixing unit prices includes all conditions of bad weather, etc. I allowed 10% in the contingency item on grading.

In addition to the 10% of quantities allowed, 10% again, on the total, is sufficient to cover the contingency item of grading, after the contractor has turned it over to the company. If it was assumed that the company was to do the work, the contingency item would not be larger. If construction is to be done by company, the unit prices would be smaller than the ones I took—at least 10%.

We have added much more than 10% in quantities; in many places, where holes and soft ground are indicated on the profiles, 100% was added to quantities, and the additional 10% besides; the blanket 10% was on account of possible allowances that should have been made in quantities or prices. It is as proper to allow contingencies for unit prices as for quantity.

Delays in receiving material may delay the work of construction, or make it necessary to put in a temporary bridge; that ought

761 to be covered in unit prices. In a way, you can foresee these things by experience. If we do not encounter those difficulties, the profit is greater. I think delays in traffic ought to be included in unit prices, not in contingencies, as should loss of men's time by bad weather. If the company did its own work, there would be no unit price, though I would estimate the graduation at contractor's price. The estimate would be the same in all respects as to quantities. The possibilities of strikes, and all contingencies of every kind into which labor entered, includng track laying, I would include in unit price, as I would, also, demurrage on material.

The delay, or loss, adding to the cost of construction, would fall on the contractor, if there is one; nothing would be allowed to contractor for that, unless otherwise specified in the contract. The item of cost of material yards would fall probably under contingencies. Assuming no contract, it would fall in the unit price, assuming a contract, it would fall there too; so it would be in the unit price either way. That would apply to all the elements of track laying; also, the engineer would have an item for an estimate of the cost of the material yard; I didn't. I made no distribution of the cost of the yard to any items. No allowance in contingencies was made, though, if found to be an increase, it is properly a contingency. Personal injuries, accidents and insurance would be contingencies, except it be a contract. The contractor generally bears all the losses. There is chance of personal injury in track laying operations; there should be no contingency, as I think the price given is ample. In the case of

762 the contractor being the railroad itself the difference between unit prices and the contractor's prices provides for the contingency. The cost of reproduction ought to be the same, whether there is a contractor or not. If the railroad company did the work, the engineer's duty would be to estimate the cost in advance; the classification of accounts would be of the same names and in the same form as here. You would have an item of contingency on such an estimate, for the company to do its own work by.

In case of construction by the railroad, the contingency item would be carried in the difference between the unit prices and the total estimated cost. It would be included in the difference between what I would have to pay a contractor to do the work and the total estimate of the work. I would include the contractor's profit in my estimate, though I had no contract, and all those contingencies would fall against the contractor's profit. The possibility of personal injuries would affect the total of the contingencies. My estimate for contingencies, being a little more than 3% of the total estimate, as a great deal of the total is for land, does not include anything for personal injuries, strikes, mistake of plans or change of method by engineers, for demurrage, for delay by transportation, for difficulty in getting or keeping labor, or anything on account of the uncertainty or appraisal of land; that is covered by unit prices, and, in case of land, the contingency is covered by the added 100%.

I intended to make the real estate price so high that no contingency would be necessary. The quantity is not uncertain in

763 the land. Contingencies are allowed to cover uncertainties in price as well as in quantity. Contingencies for strikes, de-

murrage, loss on account of controversies between engineer and contractor, material yards, difficulty in securing labor and uncertainty of unit prices is included in contractor's price, which I always assume in figuring. I added 10% for contingencies to each of the items, 3 Grading, 16 Sidetracks, 20 Shop Machinery and Tools, 29 Engineering, 38 Legal Expenses, 39 Organization and General, 40 Interest and Taxes, 41 Fixtures and Furniture, 42 Stores and Supplies.

No one would expect the same percentage to apply to each of these items; it could not be precise. The item of contingency cannot be the result of analysis; it is a matter of judgment, based on experience. You would not include a grading price high enough to cover the 10% here allowed, as that contingency covers quantity as well as price. The same result would be obtained by applying it direct, so much in quantity and so much in price. I think 10% added in Cooley appraisal for contingencies to the whole; at that time engineers did not attempt to analyze.

They had not added 100% and 25% to quantities that I have added, so they are hardly comparable. If I analyze closely, the contingencies diminish; I don't know as I know of the reproduction of a railroad by any state or railroad engineer where the percentage of contingency to the total was as low as this. For a road to be built, I should estimate higher; sometimes I go as high as 15%, I think the practice is from 10% up. Of course, they are not in a position to analyze as closely as I was in this case.

764 It is frequently necessary, on account of indeterminate factors, to allow higher percentages. I don't know, as less than the 4% on total allowed by me is much lower than customary or usual for new work, or for estimate of C. O. R. I have studied percentages allowed for contingencies; as high as 10% has been allowed by many engineers for specific purposes; e. g. cost of reproduction of a railroad. I cannot tell what percentage of the total has been allowed in state estimates and by railroad engineers. There is no common practice on the subject of reproduction; we are in embryo state on that.

I don't know of any of the railroads that you speak of that have actually surveyed the line, and therefore the contingencies must be higher, and under certain conditions of unit prices contingencies should be higher or lower.

In New Jersey, I included contingencies—called it overhead charges, interest, and so on; that was everything; we included engineering, interest, lawyers and organization at 7%; it was too low to get fair reproduction value. It would be too low here, because I have allowed 16.4% on those same items.

There is a customary practice in engineers' offices as to contingencies for work to be done; the minimum on railroad work is 10% of the total, covering everything.

Q. Now, the justification then for a lower percentage here lies in the fact that the work exists, a greater familiarity and ability to analyze the costs, than would be in case it did not exist?

765 A. That is the controlling factor, yes.

In reproduction of this railroad I have assumed completion of the whole in 2.5 years from time construction was begun on

any particular division. Assuming any division could be concluded within 2.5 years, I assumed as divisions from St. Ignace to Marquette, 155 miles, another from Marquette to State Line and another from Nestoria to Houghton, each taking 2.5 years, whether done contemporaneously or not. I would have material yards at several points, as stated in Defts.' Ex. 15. Assuming the existence of other railroads, I don't think it would take more than 2.5 years for entire road to be built at the same time. Some parts of it could be constructed in better time except for soft or swamp ground. The cost of the legal end, in the preliminary work, before acquisition of the land, would take over 2.5 years, perhaps I ought to have added another six months on that item.

At the end of 2.5 years, you would not have as good a roadbed as now, because it has to have age to season it; that cannot be included in reproduction. If the operation is successful, as to that item, reproduction estimate is always necessarily less than actual value as an operating tool. As an instrument of commerce, the roadbed solidifies by time, and operation over it is better. Much of the roadbed in flat, soft country is made of gravel hauled from pit over a long period of years. This is done at an increased cost over reproduction
766 new estimate. It is impossible to say when construction ends and operation begins.

A considerable amount of yardage must be moved after contractor finishes and during the first few years of operation, to take care of settlement, shrinkage, maintaining shoulders, etc. It is difficult to consider that item under a percentage, as height of bank has much to do with it. As to unit prices, the fact that quantities were put in piecemeal is not considered in reproduction estimate; as to quantities, an effort has been made to cover that point. I aim to get the quantities that were there, and assumed that they were put there as part of the original grading. As a practical matter, until you have sod on the bank, you must keep renewing it.

In the existing road, the grades have been corrected, cuts filled in, high bluffs cut down and curvature and alignment changed, frequently resulting in abandoned property, which reproduction estimate does not reflect. Reproduction estimate does not reflect added cost due to piecemeal construction. Generally speaking, the yardage put on after operation of the line commenced would cost more to get it there than if it had been put on all at once. This is due to slow orders and all that. On the other hand, we must remember that, with a track there to haul our material, in many instances, it would be done cheaper. Generally it would be dearer, but, if you go into as much as half or a quarter, I don't think it would hold, when a small amount has been added, it is a great deal higher; the smaller the quantity, the greater the increase of unit cost; that increased unit cost, might increase average substantially.

767 Have made a study of the progress of cost of grading per yard during the past 50 years; it doesn't result in giving me any information. I have consulted contractors, in some cases they are higher, but increased efficiency in tools, and the knowledge of how to do, sometimes counteracts that. Leaving out of consideration land costs, and taking into account piecemeal construction, I think,

in come cases, if we were able to analyze those things, we would find that the first cost of a railroad was higher than the cost now to reproduce; I think frequently, enough to take up the increase in value of right of way. Concrete and constructural steel are the only items which have gone down.

Rail 30 or 40 years ago cost $60 to $100 per ton. It would be difficult in the absence of records to ascertain original cost of South Shore.

Q. Assuming a development and growth of the road like the South Shore in that territory during a period of say 30 years, you would expect original cost of the parts of that road, leaving out the land now for the time, to be as high, would you not, as your estimate of reproduction new?

A. I don't like to go on the record, because I haven't had an opportunity to make that search, but I would be under the impression that I might expect to find that to be true.

Cost of reproduction of South Shore would be increased, I think, if there were no other railroads in the territory, in cost of sup-
768 plies, subsistence, materials, labor and boarding men.

Q. The problem of depreciation, I think we agreed during the cross-examination, was an important one, and quite elusive, like the definition of values?

A. Yes.

I did not intend to represent South Shore as in only 81% of operating efficiency, or that it is not in proper efficiency. The 81% is the first column depreciated into the second column; you could not get the second column without first spending the money in the first. I did not intend to indicate that the value of the use of the property in its existing condition was less than the value of its use new. Certain parts of it as an operating tool are more valuable than if brand new.

This is true of all parts of the road, so far as earnings and operation are concerned. My depreciation is based on inspection. The percentages of condition arrived at by application of straight line method of depreciation does not represent value any more than present value column or percentage column in my appraisal; they are often unjust. Railroads, generally, reasonably well located, with reasonable traffic and rates, properly operated and maintained, are always worth more than reproduction new cost; we pre-suppose a net revenue if they have reasonable traffic and reasonable rates. Assuming a reasonable volume of business and reasonable rates, the South Shore road as an instrument of commerce is worth more than
769 my estimate of its reproduction new cost at $15,500,000, leaving out the terminals. The commercial or sales value may be destroyed by reduction of rates.

If the road was earning a sum over and above its fixed charges, it would be worth more than it could be produced for, meaning the commercial value or the estimate of its value in the eyes of the public, as shown by the earnings. The par or market value of the stocks and bonds, or the sale value, has nothing to do with the value of the use of the property.

Including International bridge, Soo Union Depot and Mackinaw Transportation Co. property, my total reproduction new value is

$15,949,099, and present value $12,334,745. This is the face of our totals, not including corrections.

It is a principle of my valuation not to depreciate labor items; Mr. Riggs, and everybody I know of, carries track laying at 100% because it is a labor item. It is a question, very debatable. Track laying and surfacing includes the temporary surfacing before ballast is applied. On ballast I did not depreciate the labor of applying, but did depreciate the material and hauling.

The hauling is a labor item; everything can be reduced to labor. We allowed 2¢ for ballast material, leaving 53¢ labor and hauling, or 4% material to 96% labor. Everything comes down to labor.

Q. Isn't it as reasonable to decline to depreciate the 96% of labor in ballast as the 100% of labor in track laying and surfacing, or the 5% or 6% in rails, or whatever per cent it is in rails?

770 A. Well, it is true that the value of all material is practically dependent on the cost of the labor, and the assumption in this case was, as with all other material, that the price of the material alongside was 35 cents, the same as we would purchase steel at $28 a ton, if we attempted to keep the labor item up. Of course, in the rail we would have to go to the steel mill, and go everywhere where the item of labor appeared, and I presume that there is a criticism, and that perhaps the whole thing ought to be depreciated including the labor.

Q. Here is an item of track laying, which is labor, all labor, a hundred per cent; now right there, analogous kind of work is ballasting; that is most all labor?

A. Yes, everything is all labor.

Q. Well, the ballasting as you analyze it—take the item as it is built up, applying ballast, it is 96% we will say for the purposes of the point, labor; now track laying is all labor, you carry it at 100 per cent?

A. Yes.

Q. And the question has come to my mind: I cannot answer myself—why shouldn't ballasting be treated in the same way, at least insofar as the 96% of labor?

A. Well, I can't say; if we carried out that theory, of course, it would apply to every item in the railroad, that we ordinarily buy. Here is how this comes about: We ordinarily buy the ballast at so much a yard delivered alongside, and the railroad installs the

771 ballast with its own force, the same as it does the rail or any other thing they buy. Now, if we analyze everything down to its constituent parts, probably 95% of everything would be labor. I was saying how this comes about. I presume, strictly speaking, that we should depreciate all the labor, but I don't know, that is a point just between.

Q. Don't you see what led to this? It was the item of rails, where you did not depreciate the hauling item or freight item of rails?

A. No.

Q. But you do depreciate the haulage or freight item, so-called, of the ballast, and it struck me that there was a sort of contradiction or anomaly there?

A. I don't think there is, after all. We generally buy the rails delivered F. O. B. at the point of delivery; we generally buy ballast the same way, and all other materials that go into construction, and the habit has grown up, I presume, the habit of thought that because we do that and because there is no expenditure on the part of the railroad for the labor in the steel plant, or in the hauling of the steel or any of those items, we consider the cost of that to be 35 cents in the case of ballast, and that the labor is performed by the railroad, and that it is constant. I don't know that that can be defended or not. I am sure I don't know whether that could be defended. It perhaps ought to be depreciated, and that is how we have depreciated it, whether it is correct or not.

772 Q. You think that track laying ought not to be; the practice is settled on that, isn't it?

A. I have always kept it constant. At the time of my appraisal in New Jersey, we debated that for hours and hours, and we couldn't come to any conclusion that was entirely satisfactory.

Ballast needs renewal from time to time, due, in large measure, to its sinking into roadbed. Upon the ballast sinking into the roadbed, it makes it better and more solid; on soft ground, I would prefer earth, or even hay, as a mattress. In the bank that has been made, filled, it is improved as a usable thing by addition of ballast. Railroad men like plenty of clean ballast, they don't figure on any value. They may consider it of value to the roadbed, but not in the value of the ballast, as it has ceased to be ballast. As a rule, it makes the railroad better. The roadbed is better after the second application of ballast, to take the place of the first, which has sunk into the roadbed, than it was before.

My estimate does not take into account betterments to roadbed by gravel additions put on as ballast. The ballast, after it settles down and ceases to perform the function of ballast, may or may not strengthen and render more stable the roadbed. A hard or solid roadbed is not desirable, but a springy but solid roadbed is. I don't suppose experience justifies the inference that the adding of ballast upon soil on South Shore makes bed too solid. It is the solidification of the embankment which makes it worth more. Sand and

773 gravel ballast sinking into the soft and unpacked places in the soil on roadbed like South Shore makes the road worth more.

The common method of construction is to elevate the outer rail at curves according to speed desired for trains; a well recognized formula for this exists. They also increase the gu*a*ge owing to the degree of curve.

This is to avoid crowding the outer wheel over the rail, i. e. to help slew the trucks. The outer rail is longer than the inner; the wheels do not turn on the axles of the truck, and both wheels have to make the same number of revolutions, so the wheels traveling on the inner rail have to slip some on the rail.

If the elevation of outer rail is markedly excessive for the speed at which trains move, flange will not wear inner rail; it never does that. There would be greater stress and wear on top or ball of the

inner rail—not on inside. In direct testimony, I was only asked about inner side.

HANSEL.

Redirect examination.

By Mr. Wykes:

I have prepared a statement indicating corrections in Defts.' Ex. 15, Hansel. (The following indicates the corrections:)

774 *Memorandum of Additions to the Hansel Appraisal of the D., S. S. & A. Ry. Ex.* 15.

Schedule I—Real Estate.

	Value new.	Present value.
Sault Ste. Marie, Items 2 and 3, page 17:		
50 foot right of way to Kelley Mayer Co., American Brick Co., Bradley Watkins Co. 2.8 Acres at $1500 ..... $4200 ½ Interest 2100	$2,100	$2,100
Marquette, Item 49, page 20:		
Consolidated Fuel & Lumber Co. grounds, 2 Acres at $1500	7,500	7,500
Marquette, Item 54, page 20:		
1160 ft. of right of way 100 ft. wide 2.7 Acres at $250	675	675
Iron Mine Branches:		
Item 67, page 21, Winthrop Branch; trackage rights 1.94 miles, considered equivalent to 50 ft right of way. 11.8 acres at $2000..... $23,600 Previous total for item 67..... 6,900	16,700	16,700
Item 68, page 21, Mary Charlotte Branch 3 acres x ($2000—$100)	5,700	5,700
Item 69, page 21, Palmer branch 31.3 Acres x ($2000—$100)	59,470	59,470
	$92,145	$92,145
Overhead expenses, 15%	13,822	13,822
Total amount to be added to Hansel Valuation, Schedule I.....	$105,967	$105,967

775 Schedule V.

Bridges, Trestles and Culverts:	Value new.	Present value.
Add $8.00 per M F. B. M. to the unit prices of timber in Bridges, Trestles and Culverts, to cover cost of transportation by team, etc.		
This addition applies to a total of 3,850 M F. B. M. and amounts to	$30,800	$18,788
Overhead expenses, 15%	4,620	4,620
Total amount to be added to Hansel Valuation, Schedule V	$35,420	$23,408

The 15% added for overhead charges was not depreciated. It takes into account the contingencies, those are not depreciated. On a bridge, when 80% condition is reached, the time has come nearer when it must be replaced; when it is replaced, it involves an engineering charge, a new contingency with the overhead charges that apply to that kind of an item. In the railroad as a whole, as the structures are replaced, the overhead charges will again occur throughout the railroad somewhere. The points at which those will occur is measured by the percentage of condition; the same
776 applies in less degree to the renewal of parts; the percentage may be higher or lower, owing to the character of the repair, but those items come under the charge of upkeep.

As the time approaches when a structure must be renewed, the time also approaches when not only the material, but the labor as well, must be put back. In a bridge structure, that appears not only in the material, but in the labor.

Q. Tell me what distinction there is between that and the item of labor that occurs in track laying and surfacing?

A. Well, in track laying and surfacing, the item that is expended by the railroad is in the act of placing the materials on the roadbed and surfacing it, and that is constant, no matter what the cost of the material is, and it has been the practice, perhaps without any sound basis, of not depreciating the cost of the track laying and surfacing, the idea being that the ballast is delivered at the price. The majority of the cost of the ballast may be in labor, but it is generally furnished the same as bridge timber or steel, or cars or any other item to the railroad generally speaking, and therefore the habit has grown up—that is, I have done it, at least—of considering the labor of putting that in place as a constant element, because it is going on day by day, all the time, and it differs somewhat from any other expenditures of labor on the road, because of the fact that it is an item that can be constantly kept at a percentage of efficiency, and it is about the only item that can.

777 Q. Then the reason you do not depreciate labor in track laying and surfacing is, that it is kept at a hundred per cent of efficiency, not that it is kept at a hundred per cent of condition?

A. That is it exactly. I stated in my testimony that, in depreciat-

ing the condition of the roadbed, I did not intend to depreciate the efficiency of the roadbed. That is about the only factor in the physical elements of a railroad that can be kept constant; it is turning over every day, you might say, except in winter time, when they don't disturb the track, but even then some things are done to it to sustain it, whereas a bridge or any other structure, you cannot overcome the decrepitude, the invisible or intangible decrepitude, there comes a time when the whole structure has got to be changed.

Q. Suppose the condition were permitted to run down to 50 per cent on track laying and surfacing, would not then, to bring it back to a hundred per cent condition, it be necessary to add both material and labor on equally proportionate amounts, to bring it back to the hundred per cent ?

A. Yes, I should say that would be true.

With the material put in to renew the track laying and surfacing goes the cost of labor of putting it in. My theory of including the cost of labor constant is for the reason that it is being constantly operated upon; it is different from any other item of the road. It is
778 ope[illegible]o a variety of opinions, whether the cost of labor should be [illegible]stant. In my opinion it ought to be included as a constant factor. On ore dock at Marquette, I depreciated 40% covering entire structure, including labor, material, engineering, contingency and everything of that character. This was true also of buildings, I don't recall any exception to the rule, except in track laying and surfacing. Labor forms a large part of the cost of all materials; it would be large in rail. There is a very small percentage of the cost of labor expressed in the iron ore. There cannot be any betterment on account of the track laying and surfacing; it is a constant factor, which must be the same item over and over again, so I feel that it always exists there. There would be a betterment where you put in a heavier rail in the excess cost.

On the inspection of the South Shore made by myself and assistants, I spent sufficient time to do the matter justice to all concerned. In my judgment, taking into account the manner of preparation for my appraisal, the inspection and time spent on the work personally by me was sufficient to form the basis for the appraisal I made. My personal time on the work covered a period of three months—something every day. I feel satisfied that I gave the work all the time it required, and it was at all times under my personal direction and supervision. Have gone over the data at hand and comprised in the appraisal sufficiently to satisfy myself that it is correct.

779 For land value I included the excess cost to acquire for railroad purposes, and the values I have placed take into consideration elements which make my valuation higher than the normal or ordinary land values in the community. For rural right of way we added 100%, and in other cases considered the severance damage in addition to the increased cost of acquisition.

Generally, where I rejected parts of parcels from railroad use, I gave higher price to the area included on account of the severance. The value of the whole, including the excluded area, would average slightly below what we averaged for the whole.

I never attempted to value the land of South Shore for railroad purposes, meaning as an income producing utility; I made no investigation of, and I don't know anything about, the South Shore earnings or its traffic, except by general observation. I have no knowledge of the operations of the road. I have not sufficient knowledge to say whether it produced or does not produce sufficient earnings, or whether a particular classification of rates is too high or too low, or what it should expect to get out of a particular kind of traffic.

Q. And if you have answered any such question, is it with reservation that you had not made any detailed investigation of those things?

A. I certainly haven't made any detailed investigation, and I do not feel entitled to answer any question along that line. I
780 did answer some suppositious questions, hypothetical questions, suppositious cases; I gave my opinion, that is all.

Q. Leaving out of consideration entirely the Minnesota rate cases and the other rate cases that have been decided since you testified, and having in mind the criticisms of your valuation that have been presented to you, are you still satisfied with the appraisal which you have made with the exception of the places in which you have modified it?

A. Yes, sir.

Q. And those modifications appear in your testimony today?

A. Yes, sir. I have no corrections that I feel should be made. I have never made any investigation to determine rate of return expected on investments in Upper Peninsula of Michigan. I have knowledge of very many bond issues which bear less rates of return than 6%, very many below 5%, a considerable number below 4.5%, and some as low as 4%.

The general concensus of opinion is that the density of traffic decreases the unit of cost; this applies in both the passenger and freight traffic.

Q. To answer whether the South Shore is or could be profitably operated, would it be necessary for you to know the character and extent and rates and costs of the ore traffic?

A. Yes, sir, all the traffic and the operating conditions and contracts for interchange of business with all the lines that there
781 is interchange or possibility of interchange with.

Q. Did you know anything about the ore traffic except very generally when you gave your previous testimony?

A. No, sir.

Q. Would it also be necessary to know the contract and operating conditions as between this railroad and the Canadian Pacific, which is a parent company?

A. Yes, sir. I think, as I have stated, it is necessary to know the contracts with all companies, that would include a parent company, if any such existed.

Q. A community that afforded a heavy ore traffic might indicate greater returns from railroad operation than would be indicated by population, or other industries generally, might it not?

A. Yes, I think it would be entirely independent of any such

conditions. It might be, and probably would be, independent of population and dependent upon the volume of ore and the price per ton mile for carriage and the cost of the service to carry it.

Q. Before you could determine whether the money could be obtained to build the South Shore, or to rebuild it, if it were taken out of the territory in which it is located at present, you would be obliged to know, would you not, the earnings, the sources of the earnings, the possibility of connections with other companies, the question of whether it was making betterments out of operating ex-
782 penses, and a great many other considerations that have not been mentioned in this case in testimony at which you have been present?

A. I would say yes to all of that.

Q. Mr. Eldredge suggests this form of question: Do you think you have sufficient knowledge upon which to predicate an opinion as to whether the money could be obtained to rebuild the South Shore?

A. No, I have not

Expense of piecemeal construction due to widening shoulders, putting in of ditches, perfection of alignment, etc. is charged to operating expenses, as a rule, and is considered upkeep of the roadbed. In adaptation and solidification due to age and renewal of ballast due to operation, there is no charge to capital for any added value growing out of those things. There is no betterment account on ballast in I. C. C. classification.

I have made no investigation of the original cost of an existing railroad; I have not had any experience except where I constructed; I have never made any investigation of a railroad or part of a railroad 15 or more years old, with a view to getting at original cost, and have never made comparisons of costs dated back 15 years or more with present day values. There is nothing in this case which permits me to make an approximation of a comparison of the original cost of South Shore with my value or Riggs' value.

Item of injury to employes in contingencies; If I were a
783 contractor, I would include it in unit prices. Road would not be worth any more because accident occurred, though it would cost that much more.

There are many other elements of items of contingency that are a burden, instead of a value; that would apply to strikes, washouts, failure of material to arrive, and a variety of other things entering into contingencies.

All of these unfor-seen expenses are included and allowed in my unit prices, except where I have allowed extra.

784 HANSEL.

Recross-examination.

By Mr. Eldredge:

Item 68, Mary Charlotte Branch, originally valued at $100 per acre, now valued $2,000 per acre; that is entirely on account of the

minerals supposed to be in the land. I made no investigation to know whether it had any other or different value; there is not any other value apparent. Regardless of what Mr. Belden stated, there is not any evidence of any demand for building purposes on strip covered by this 3 acres. I did not pay any attention to Mr. Belden; the land was unoccupied and there was no evidence of activity.

Embankments increase in value by lapse of time. I allowed no such value on South Shore in reproduction cost, except to give 10% on account of the shrinkage to try and produce the same condition which it is impossible to produce actually, meaning 10% extra yardage allowance. It is the practice of many railroads to sod their embankments and frequently the slope of the cuts. Nature does the same on slopes and banks; they add value to the railroad, and could be appraised. I included no such elements in my valuation. In answer to Mr. Wykes' question, I mean that, as a general proposition under ordinary conditions, the land along the railroad increases in value after the construction.

Route of South Shore into Marquette and Houghton from east especially adapted for railroad use. I added no value on ac-
785 count of that. South Shore road as it comes into Marquette, after crossing Carp River, presents a cheap method of constructing a railroad almost the cheapest imaginable. Referring to construction, it is very economical and leads to a natural place for a yard. The cost of constructing that railroad and yard is less than it would be approaching Marquette from east over any other route.

Q. Would it not be a way to estimate the value of that land for railroad purposes, if you took the difference between the cost of the construction through it and the cheapest cost elsewhere?

A. Yes, that would be a minimum value for it; it might be worth a great deal more. I didn't undertake that problem, you understand.

Q. Estimated in that way, it would present a minimum value?

A. I think so.

Q. Estimated in that way, the valuation which you have put upon the company's property in Lake Street, aside from the water front in connection with the ore docks, speaking of it simply as railroad construction, is much less than its value for railroad purposes?

A. Speaking of it that way, yes sir.

Q. And that is true of the entrance into Houghton, all the way practically from Chassell, to Houghton, is it not?

A. Yes, not in such a degree, I should think, though; not to such a degree in dollars and cents, I should think In other words,
786 the difference per mile would be greater at Marquette. I should think; it would be higher cost at Marquette per mile.

Q. Can you bear the location in mind?

A. I think I do.

INDEX TO VOLUME II.

	Original.	Print.
Testimony of Crescent A. Parker	787	577
Clerk's certificate to volume 2	892	648
Testimony of Henry C. Adams	893	650
Mortimer E. Cooley	949	683
F. L. Batchelder	992	708
Henry R. Harris	1002	715
Stephen Wood	1008	718
Dias Wiseman	1016	723
John Hager	1019	725
Martin Ryan	1020	726
Joseph Durocher	1023	727
Charles E. Lytle	1025	728
Morgan W. Jopling	1054	745
Edward C. Anthony	1056	746
Charles R. Lewis	1058	747
Robert B. Rifenberick	1074	756
Sumner G. Horton	1076	757
Festus R. Metcalf	1108	779
J. R. Davis	1110	780
Fred M. Twiss	1124	789
A. B. Hubbard	1134	795
Charles M. Whiteside	1133	796
Joseph L. McCheskey	1141	798
William M. Snell	1143	799
Charles E. Chipley	1147	801
Charles Ripley	1150	803
Ralph J. MacKenzie	1155	806
William Pierce	1162	810
Charles J. Johnson	1163	811
James Kennaugh	1165	813
L. J. Le Veque	1171	816
F. J. Burtless	1172	817
Thomas McCormick	1175	818
Edward C. Cooley	1186	836
Melville W. Thompson	1195	842
Clerk's certificate to volume 3	1323	913
Testimony of Augustus C. Hone	1324	914
Albert R. Dilley	1325	914
Rolland C. Allen	1326	914
Charles A. Lindsay	1350	927
John B. Berry	1399	955
Charles P. Howard	1434	975
Wayland W. Walker	1450	985
Ray Brotherton	1459	990

		Original.	Print.
Testimony of	Jacob P. Werner	1463	992
	F. J. Bachelder	1464	992
	Levi P. Atwood	1477	1001
	G. F. Bristol	1491	1015
	George L. Fowler	1495	1016
	Nelson Caderette	1497	1020
	A. E. Delf (recalled)	1512	1028
	R. C. Young (recalled)	1566	1058
	Edward S. Bice	1569	1060
	Charles F. Loweth (recalled)	1571	1061
	C. A. Parker (recalled)	1577	1065
	George E. Fisher	1639	1100
	L. C. Smith	1640	1100
	Hazeal J. Payne	1642	1101
	Elden E. Dadson	1646	1103
	Clement C. Williams	1659	1110
	Edmund J. Kates	1681	1123
	Edgar French	1684	1130
	Henry C. Adams	1686	1131
	C. W. Hillman	1694	1136
	W. W. Walker	1729	1156
Agreement to statement of evidence		1734	1159
Judge's approval of statement of evidence		1734	1159
Clerk's certificate to volume 4		1735	1159
Stipulation in regard to printing record		1736	1160
Complainant's Exhibit	33—Statements of mileage	1740	1163
	35—Statements of operating revenues (entire line)	1749	1167
	36—Statements of operating revenues (in Michigan)	1752	1170
	43—Mileage statement	1755	1173
	52—Statement of estimated loss by application of act 276	1757	1174
	53—Railroad mileage from report of Michigan Railroad Commission, 1910	1761	1179
	54—Statement of operations, &c.	1762	1180
	55—Five-year view of railroad income per mile	1765	1184
	67—(Extracts from) Statement of revenue train mileage, year ending June 30, 1913, &c.	1767	1185
	68—Statement of estimated loss by application of act 276	1771	1188
	201*a*—Valuation statement 1914	1774	1190
	201*b*—Valuation statement 1915	1775	1190
	201*c*—Valuation statement 1916	1776	1190
	220—Statement of operations in Michigan, June 30, 1914	1777	1191
	221—Computations of rate of return on property valuation	1783	1195

787 On July 23, 1913.

CRESCENT A. PARKER, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I have been connected with the Michigan Tax Commission and State Board of Assessors since March 1, 1901, first in a clerical capacity, and later as accountant, performing work of accountant eight or ten years, and carrying the title since 1909. I have access to records and files of the Tax Commission and State Board of Assessors.

(It is agreed that the Cooley 1900 appraisal was a valuation of the physical property of Michigan railroads, with the intent to establish the cost of reproduction new and the present value as depreciated.) The summary of that valuation indicates the value of the separate items of physical property and the totals of physical property of plaintiff, which are: Cost of reproduction, $11,433,202; present value, $8,875.624.

(It is understood between counsel that the whole of such appraisal shall be considered in evidence; the record marked Defts.' Ex. 23, 1900 appraisal. Mr. Eldredge details objection to introduction of 1900 appraisal, and Mr. Wykes states the purpose for which it is introduced, being to establish value in 1900 bearing on value today.)

(Witness produces summary of 1902 State appraisal; same marked Defts.' Ex. 24, and offered in evidence.)

(Counsel agree, with reference to the valuation of 1902, that its general purpose was this: Plaintiff had filed a bill in the United States Court to restrain the collection of taxes upon its property, claiming that its property was assessed in the year 1902 at full cash value, while property throughout the state locally assessed was assessed at
788 less than its true cash value. The State defended, on the ground that if the property throughout the state were not assessed at true cash value, neither was the property of plaint- so assessed. The items of the inventory of the property of plaintiff valued on the part of the State in 1902 were in general the same as in the 1900 State appraisal.)

In the summary of 1902 appraisal of plaintiff's property, the several detailed items are given; the totals, excluding stores and supplies, are, cost of reproduction, $11,820,036, and present physical value, $9,087,095.

Substantially the same people made the 1902 appraisal as that of 1900, Professors Cooley, Adams and Riggs being employed. The State had passed an act assessing railroads on ad valorem basis, and the 1902 appraisal was done as a part of the Attorney General's work in defending litigation involving taxes of 1902. The railroads con-

tended that a general under-valuation of the general properties of the state existed, and that the general properties were assessed at a fraction over 81%, and the appraisal was made to show that the railroad property was not assessed at its cash value in 1902, but, rather, was undervalued.

PARKER.

Cross-examination.

By Mr. Eldredge:

The summaries of the 1902 appraisal are the only details of any kind connected with that appraisal which are in our office. These summaries were turned over — the Tax Commission after the litigation, for use in revising the 1900 figures. The railroads were first taxed ad valorem on property in 1902, and the South Shore final assessment was $12,500,000; the assessment of 1903 was $11,000,000.

789 PARKER.

Direct examination resumed:

In 1905, there was another valuation of railroads in which Professor Cooley participated, and of which he had charge. This was an attempt to cause the State Board of Assessors to increase the railroad valuation. The Attorney General claimed the assessment to be too low, and retained Professor Cooley and his associates. (Witness produced summary of the appraisal, which was marked Defts.' Ex. 25, and introduced in evidence.) The summary shows results for plaintiff for 1905 as follows: Cost of reproduction, $12,818,512; present value, $9,960,405. The appraisal of 1905 was completed Feb. 14, 1906.

PARKER.

Cross-examination resumed:

The detail of this summary of the 1905 appraisal is in the Attorney General's office.

PARKER.

Direct examination resumed:

(It is agreed between counsel that reports of plaintiff to the Michigan State Board of Assessors and the Michigan and Wisconsin Railroad Commissions, 1900 to 1912, and all reports filed with such board or commissions during the pendency of this litigation, are to be treated as in evidence and may be referred to and included in the record, and used by either party.)

The details of value and description of property of plaintiff, as claimed in its sworn reports to the State Board of Assessors from 1903 to 1912, are as follows:

790 Plaintiff's report to the State Board of Assessors for the year ending June 30, 1912, under the caption, "Real Estate Owned. Detailed statement of the real estate owned by the Company in Michigan on the 30th day of June, 1912, where situate and the value thereof. (Typewritten sheets may be attached if necessary.) Description and Location. * * * The value of the following items being taken together to make up the total value: Engineering, Right of Way & Station Grounds, Real Estate, Grading, Bridges, Trestles & Culverts, Ties, Rails, Track Fastenings, Frogs & Switches, Ballast, Track Laying & Surfacing, Fences, Crossings, Cattle Guards & Signs, Interlocking & Signal Apparatus, Telegraph, Station Buildings & Fixtures, Shops, Roundhouses & Turntables, Water and Fuel Stations, Warehouses, Docks & Wharves, and Miscellaneous Structures," reports the value as $9,117,946

The personal property, under the caption, "Personal Property. Detailed statement o fall Personal Property, including moneys and credits owned by the Company in Michigan, on the 30th day of June, 1912. (Typewritten sheets may be attached if necessary.) Description. Personal property of the Duluth, South Shore & Atlantic Railway Co. situated in the State of Michigan as follows: Cash, Stores & Supplies, Shop Machinery & Tools, Ferries, and a proportion of the total value of Locomotives, Passenger, Freight and Miscellaneous Equipment," is reported as 2,027,000

A total of $11,144,946

The oath in plaintiff's 1912 report to the State Board of Assessors was as follows:

"I, the undersigned, A. B. Eldredge, President of the Duluth, South Shore & Atlantic Railway Company, on oath do say
791 that the foregoing return has been prepared, under my direction, from the original books, papers, and records of said Company; that I have carefully examined the same, and declare the same to be a complete and correct statement of the business and affairs of said Company in respect to each and every matter and thing therein set forth, to the best of my knowledge, information and belief; and I further say that no deductions were made before stating the gross earnings or receipts herein set forth, except those shown in the foregoing accounts; and that the accounts and figures contained in the foregoing return embrace all of the financial operations of said Company during the period for which said return is made.

"I further state that the valuation of property, except as otherwise appearing, are my estimates of the value based upon earning capacity of the property & that I have no other means of personally making a valuation. I further state that I do not know the value of the lands listed as not used in operation and I believe that some of the lands so listed are in fact used for railway purposes, that this is a

matter not easy to determine and is now involved as a legal question in a suit between the Railway Co. & the State.

(Signed) A. B. ELDREDGE, *President.*

Subscribed and sworn to before me at Marquette, Mich., this 14th day of September, 1912.

(Signed) W. J. ELLISON,
Notary Public."

The records of the State Board of Assessors, 1902 to 1912, show the following details with regard to values reported and claimed by plaintiff, and assessments made of the property:

Year.	Total claimed in report.	Tentative assessment.	Final assessment.	Claimed on review by plaintiff's representative.
1902.....	$4,462,261	$11,250,000	$12,500,000	$7,698,850
1903.....	7,832,195	11,300,000	11,000,000	9,000,000
1904.....	7,777,224	10,000,000	9,500,000	7,950,000
1905.....	7,711,354	9,650,000	9,500,000	8,434,133
1906.....	7,884,151	9,650,000	9,625,000	9,000,000
1907.....	7,898,925	9,675,000	9,675,000	No Appearance
1908.....	7,655,582	9,675,000	9,675,000	" "
1909.....	7,426,535	9,600,000	9,600,000	" "
1910.....	7,768,605	9,600,000	9,600,000	" "
1911.....	11,131,000	9,600,000	9,600,000	" "
1912.....	11,144,946	9,600,000	9,600,000	" "

792 PARKER.

Cross-examination resumed:

Plaintiff was represented on review, 1902 to 1906 inclusive; its representative, on each appearance, claimed values higher than stated in the report; in no instance did the Board adopt as low a value as claimed by plaintiff's representative.

I have been present at a number of the sessions of the State Board of Assessors when they valued railroad property; they did not make a valuation of each separate item, except through following the State appraisals. There are no details kept of the railroad assessments. The Board comes to their judgment and sets down the gross figures; I don't think the valuation of any road was ever based on an inventory and valuation of the separate items. It is not the individual judgment of any one man.

The starting point was largely the Cooley appraisal, and they took into consideration earnings and prospective earnings. They started out with the Cooley appraisal, which has always been before them as a guide. If the earnings indicate a greater valuation, they use the earning value. I think there never was but one road assessed more than the Cooley and Adams appraisals.

PARKER.

Direct examination resumed:

The statute requires the State Board of Assessors to assess railroad property at its true cash value. The Board has before it the idea that the general property is under-assessed, and that probably affects its judgment, somewhat, in these matters, but I would not want to state.

793 The following is a part of the certificate attached to the assessment roll:

"I do further certify that we have set down in the above assessment roll, all the property of railroad companies, union station and depot companies, telegraph companies, telephone companies, sleeping car companies, express companies, car loaning companies, stock car companies, refrigerator car companies, fast freight companies, and all other companies, subject to taxation in this State by a State Board of Assessors, according to our best information, and that we have assessed the same at what we believe to be the true cash value thereof."

The Gailbraith bill was Act 282 of 1905; under that bill, the Board attempted to establish the average rate, by bringing the other property to its true cash value. After the passage of the Galbraith law, the Board attempted, following provisions of that law, to determine an average rate, by adding to the value of the state a certain amount which they conceived was the amount necessary to bring the assessed value of the state to 100%, using that as a divisor for the purpose of determining an equalized rate, dividing that into the amount of the tax of the state for that year. The rate applied to railroad properties is the average rate on general properties of the state assessed locally.

That average rate in 1905 was $17.40. The assessed value of the state for that year was $1,574,422,700, and the Board, in the attempt to equalize, brought that amount up to $1,875,000,000, on the assumption that the assessments of railroads were at cash value. Since 1905, the railroad assessments have not fallen off, but have increased seven or eight millions; a number of small properties have gone off the roll. The increase has been in the value of the same properties.

In the first year, the State Board attempted to make an equalization, and the equalized average rate then reached was $13.62; the actual average rate that year was $16.55, while the 1912 rate

794 was $20.80, per thousand dollars of valuation. The State Board of Assessors in 1902 found the percentage of undervaluation of the general property of the state to be at 82%, or substantially 18% less than cash value. That action proceeded upon the assumption that the railroad properties were assessed at cash value and the other property at 82% of value. In the attempted equalization of 1905, the percentage of assessment of the general properties was found to be 84%, and the railroad properties were assumed to be at cash value.

The aggregate assessments of the railroad properties were, in 1902,

$198,641,000, and in 1912, $210,884,500. From 1902, the assessments of the general properties of the state have steadily increased. The State Board of Assessors, in making its railroad assessments, always has before it the inventories and appraisals of 1900, 1902 and 1905; they compare back and forth, and take into consideration all the elements that they can consider in valuing property. They have before them an abstract of the reports containing, in condensed form, the mileage for ten years, the equipment, cost of the road, cost of equipment, earnings, expenses, income sheet, balance sheet, previous assessed valuation, Cooley and Adams appraisals—every item of information it can give them—and additions and betterments, shown in a separate item.

The Board does not place any separate value on the specific items, but their attempt is to reach a value for the property. The value is really the agreement of the members of the Board, and may be a little more than the Cooley appraisal with additions and betterments, and sometimes a little less. The Board, in making its assessments, has before it the figures reported by the company as the value of its property.

795 PARKER.

Cross-examination resumed:

I would not say the Cooley appraisal of 1900 was very good evidence of the value of a railroad in 1913, nor would the 1905 appraisal be, without additions and betterments. The value of all railroads is higher in 1912 than in the appraisal of 1900, and, in many instances, considerably.

PARKER.

Direct examination resumed:

The State Tax Commission has a large force of men at work in nine or ten counties endeavoring to bring them to cash value; they are now working in Marquette and Baraga counties, and last year worked in Gogebic, Iron and Dickinson counties.

The general instruction is that they are to value these properties as near as possible to cash value. They go out and make the examinations (they are equipped with the sales), to verify the sales in the first place, the first and second parties, and the consideration, the parties to the paper, and to value all the property, real and personal. And they are instructed to inspect every piece of property on the assessment roll, and to discover omitted properties. They are expected to examine, and pass their judgment on, every piece of property. The report is filed with the Board, and it calls a review, if necessary. Gogebic County was completed and reviewed last year, and the property placed on the roll.

(Mr. Eldredge makes detailed objection to the results, on the theory that the man investigating should be produced to prove the

values. Defendants' position is that values for assessment so fixed are evidence of the value of the adjacent railroad lands.)

796–7 I have tabulated the figures showing the values placed by the citizens' committee in Marquette on certain real estate there as an informal assessment, and also the assessments of 1911 and 1912. The tabulation shows a list of lands commencing at about the south city limits of Marquette and proceeding right through the city to the western limits, following the track as closely as possible; also the lands following the south track out of the city, and the lands following the Dead River branch, to the north. It shows the addition they are located in, the description as found on the assessment roll, the value placed on that same property by the informal committee, and the value at which said properties were assessed in 1911 and 1912.

The figures appearing in the last three columns are dollars. The descriptions are sufficient to identify the lands. I took the figures off the rolls, myself, and I intended they should be, and I believe they are, correct. I think the majority of the cases have buildings on, and they are included in the figures. The table is marked Exhibit 27*a*.

798 By informal valuation is meant that made by a committee with regard to which plaintiff's witnesses, Robertson and Asire, were cross examined. (Mr. Eldredge makes detailed objection, on the ground that the figures are not official and have no more weight than any other hearsay evidence.) I found this informal roll in the office of the City Comptroller, in Marquette, and other figures for 1911 and 1912 were taken from the original assessment rolls. The State Board of Tax Commissioners is now making a valuation and assessment in Marquette County, having completed Marquette City. The law requires Michigan assessments to be at cash value. These rolls contain the usual certificates which state these assessments to be at cash value.

PARKER.

Cross-examination resumed:

Notwithstanding the law makes this requirement, it has not always been complied with. Until the State Board of Tax Commissioners took the matter in hand, cash value assessing had not been done, I think, anywhere in the state. The Tax Commission took the matter in hand seriously a number of years ago, and then there were a few years they were rather quiet, hindered by the fact that their powers were curtailed; the law now gives them ample power.

I made up the Marquette list, myself, from the rolls. I think, in general, you could follow the descriptions of the outlying property along the line of South Shore, from the south, right through to the west. The property in Marquette is either adjacent to the railroad property or was so situated as to, in my judgment, throw some light on its value.

799 The Tax Commission was trying to get the property as close as possible to cash value. There is always a range of judgment, and somewhere between the ranges of judgment the truth lies. They don't want to get it over cash value, but endeavor to get cash value. I have not had an opportunity, personally, to know what they did to real estate values in Marquette; the records are not back here yet. The values now appear on the local assessment roll, and are accessible there.

PARKER.

Direct examination resumed:

The only case where real estate is omitted is where someone is exempted. The Tax Commission was very active from 1900 to 1905. During that time, many counties in Lower Peninsula—60% of them—were reviewed. One year, 20 counties were reviewed. Except on one or two special complaints, the general trend, where reviews have been held, has been upward. The assessments of the state from 1899 to 1905 were increased from $968,000,000 to $1,574,000,000, an increase of $606,000,000. From 1905 to 1912, the increase was to $2,078,694,409, or an increase of $504,000,000. From 1902 to 1912, the increase was $660,000,000.

I have attended reviews; the field men are present at them. In the last few years, there has been a placard at hearings, stating all property is to be assessed at cash value. I don't think there are any printed instructions to the men; frequently, we have taken them in for a school of instructions. I attended the last one, here, in December. At this meeting, the problems met in the work are talked over; the Commission gave its ideas regarding the work, and the general instructions were cash value.

800 PARKER.

Cross-examination resumed:

Relatively, the Tax Commission has not been reducing the valuation of property reported by tax payers under oath below the figures represented in many cases; I know of two instances. I know of no instance where they did in a whole town. In the year in which they valued 21 counties, the force of men employed was 50 or 60, and they were engaged largely in verifying sales, etc. They took from the County records all of the sales, and interviewed one or both of the parties, verifying the sales and finding out the actual considerations.

Mr. Wykes: Mr. Eldredge, in the litigation referred to, in 1902, in the course of which the valuation of 1902 was made, will you concede that this litigation was in the Circuit Court of the United States for the Western District of Michigan, and that it was appealed to the Supreme Court of the United States, and that one of the claims of error of the complainant was as follows? The claim of appeal is this:

"The assessment in question in this case was upon the property of the complainant at its true cash value. The rate imposed upon the property of the complainant by the proceedings in question in this case was the average rate paid upon property in the State other than that included in said Act upon which ad valorem taxes were assessed for State, County, Township, School and municipal purposes. The evidence shows that such other property was uniformly intentionally and generally assessed at the time in question at eighty-two per cent (82%) of its true cash value; 17 per cent of the tax in question, therefore, should be set aside."

Mr. Eldredge: Objecting to the proof as irrelevant and immaterial, I do concede it.

Mr. Wykes: I produce the record in the case of the Duluth, South Shore & Atlantic Railway Company against the Auditor
801 General, Perry F. Powers, being No. 477 of the October term of the Supreme Court of the United States of 1905, and ask to have it marked as Defts.' Ex. 26. That is the official printed transcript.

Mr. Eldredge: Objecting to it as irrelevant and immaterial, I will concede that in that litigation the complainant here offered in evidence a communication from the State Board of Tax Commissioners to the State Board of Equalization, in which they set forth that they had determined the percentage of true cash value as compared with the assessed valuation in certain townships, as follows:

Alger County:

Au Train	75.0%
Burt	80.0%
Limestone	75.0%
Mathias	70.0%
Munising	90.0%
Onota	90.0%
Rock River	75.0%

Baraga County:

Arvon	52.6%
Baraga	50.1%
Covington	57.2%
L'Anse	43.0%
Spur	48.2%

Chippewa County:

Sault Ste. Marie Township	65.0%
Dafter Township	65.0%
Superior Township	75.0%
Trout Lake Township	60.0%
Sault Ste. Marie City	100.0%

Gogebic County:

Bessemer City	66.8%
Ironwood Township	56.3%
Bessemer Township	50.0%
Wakefield Township	37.9%
Marinesco Township	87.5%

Houghton County:

Chassell Township	51.9%
Duncan	54.3%
Portage	48.7%

802

Luce County:

Columbus Township	65.0%
McMillan Township	75.0%
Pentland	60.0%

Mackinaw County:

Brevort Township	94.1%
Hendricks	30.0%
Moran	80.0%
St. Ignace	63.0%
St. Ignace City	101.1%

Ontonagon County:

Haight	41.5%
Interior	38.1%
Matchwood	44.4%
McMillan	34.2%
Rockland	56.2%

Schoolcraft County:

Manistique Township	48.8%
Germfask	22.8%
Seney	31.3%

It is stated that these percentages do not include the assessed valuation of several mines.

Mr. Wykes: Will you admit that at the time of the litigation Mr. Dust was a member of the State Boards of Tax Commissioners and Assessors and was called as a witness for the complainant?

Mr. Eldredge: Yes.

Mr. Wykes: Will you admit that he testified that the State was assessed at from 85% to 90% of its value?

Mr. Eldredge: I will admit that upon cross examination Mr. Dust testified that he had no knowledge of any county in the state which

was, in 1902, assessed as low as 30%, saying, "I don't think there was any assessment as low as 30% in 1902, giving your best estimate," and he said, "Well, I should think from 85% up, 85% up to 95% or 96%, or along in there."

Mr. Wykes: Will you admit that two of the other commissioners—Freeman and Sayre—made affidavits on behalf of the com-
803 plainant to the effect that the state was assessed at above 80% of its cash value in 1902?

Mr. Eldredge: It is understood, Mr. Wykes, that all of these admissions are subject to my objection that the testimony offered is irrelevant and immaterial.

Mr. Wykes: Yes.

Mr. Eldredge: I will admit that in that litigation Tax Commissioner, Freeman, said, in an affidavit made on behalf of all the different complainants in the litigation referred to, that the total true cash value of the property of the state of Michigan, other than that subject to assessment by the State Board of Assessors, *were,* according to the information and knowledge of said Freeman, assessed at 82.7% of the true cash value thereof, and that Commissioner Sayre, in a like affidavit, said exactly the same thing.

Mr. Wykes: Will you admit that that affidavit was prepared for these men by complainant's attorney?

Mr. Eldredge: If the record shows it, I will admit it.

PARKER, recalled.

Further direct examination.

By Mr. Wykes:

The State Board of Tax Commissioners has informed the State Board of Equalization every five years of the cash value of the state, as determined by them; to get the data on which to advise, a systematic investigation was carried on; the advice was submitted, generally, in the form of a report. The State Board of Equalization met in 1911, and the State Board of Tax Commissioners made a report to it that year. The getting together of the data upon which that report was based took most of 1910 and to the middle of August, 1911, with a force varying from 60 to 80 men, and, at times, 100.

804 Q. What was the method of their investigation?

A. The first step was to take from the County records, or the records in the office of the Register of Deeds, a transcript of the sales that had taken place in two or three years. Those sales were then classified; I mean, by that, they were taken and sorted over with a view of getting rid of all dollar considerations, with a view of eliminating, as far as possible, all transactions that appeared to be family transactions, between relatives and families, with an idea of getting only straight sales to use in its investigation. In a great many counties, they made personal investigation with their men, verifying these considerations stated in the papers, verifying from one party or the other, the party that sold or the party that purchased the property. In other counties, they confined their attention to simply an inves-

tigation of the sales or a computation based on the sales as compared with the assessed valuations. In all of the counties, they compared the sales with the assessed valuations of the same properties that were involved in the transactions.

The purpose of the recourse to sales was to establish the sale value of the property. (The witness produced a copy of the report of the State Board of Assessors, based upon the data thus gathered for 1911.) The percentages reported for the several counties traversed by the D. S. S. & A. were:

Alger	44.8%
Baraga	44.1%
Gogebic	22.7%
Houghton	76.4%
Marquette	37.0%
Ontonagon	37.5%
Chippewa	59.3%
Mackinaw	43.4%
Luce	56.5%
Schoolcraft	34.8%

805 The report states the method of collecting the data, and the number of sales examined.

Q. Read that part of the report, will you, please?

A. "General property. Transcripts of all real estate transfers evidenced by warranty deed, covering a period of 3 years, were taken from the records in the offices of the various registers of deeds throughout the State. The number of transfers so taken was over 200,000 and included all recorded within the period mentioned. The consideration named in each of these sales was then compared with the assessed valuation of the same property and these records were then taken to the office of the Board and the data properly assembled; only such transfers were used in making compilations as upon examination and investigation were found to be bona fide sales. The per cent of assessed to actual value for each county was then determined, based upon the considerations in the various deeds, and the assessed value of the same properties; this per cent was then applied to the total assessed valuation of both real estate and personal property in the county. The Board in so far as it has been able to do so with the force at its command, has examined and verified the transfers referred to."

The report is a printed public document. Personal property did not enter into the percentages; they were determined on real estate. The percentages arrived at and reported for the different townships through which the line of the South Shore runs were:

Alger County:

Au Train	32.4%
Munising Township	40.2%
Onota	55.5%
Rock River	46.7%

Baraga County:

Baraga Township	54.2%
Covington	34.5%
L'Anse	43.3%
Spur	49.3%

Chippewa County:

Bay Mills (No percentage arrived at)	
Superior Township	65.58%
Trout Lake	44.47%
Sault Ste. Marie City	74.43%
Sault Ste. Marie Township	59.7%

806

Gogebic County:

Bessemer Township	49.33%
Ironwood Township	34.24%
Wakefield Township	40.71%
Bessemer City	43.27%

Houghton County:

Chassell	28.03%
Duncan	33.92%
Portage	47.26%

Luce County:

Columbus Township	26.70%
McMillan	38.05%
Pentland	41.77%

Mackinaw County:

Brevort	35.48%
Hendricks	45.35%
Moran	36.17%
Portage	52.69%
St. Ignace Township	53.71%

Marquette County:

Chocolay	49.8%
Ely	14.1%
Humboldt	41.7%
Ishpeming Township	22.8%
Marquette Township	34.9%
Michigamme Township	31.5%
Negaunee Township	27.5%
Republic Township	45.3%
Sands Township	12.1%
Tilden	34.1%
Ishpeming City	55.7%
Negaunee City	40.5%
Marquette City	62.7%

The townships in Marquette County through which the road does not run shows percentages as follows:

Forsythe	32.1%
Powell	31.0%
Richmond	16.1%
Skandia	25.8%
Turin	37.6%
Wells	28.8%
West Branch	32.8%

The percentages for townships in Ontonagon and Schoolcraft counties through which the road does not run are as follows:

807 Ontonagan County:

Haight	30.19%
Interior	23.35%
McMillan	19.92%
Matchwood	23.63%
Stannard	22.20%

Schoolcraft County:

Germfask	26.91%
Cusino	22.06%
Seney	28.33%
Manistique	29.17%

Previous to the meeting of the State Board of Equalization, in 1906, information and data on sales were collected by the Tax Commission for the report to the State Board of Equalization. The data collected for the 1906 report did not enter into the 1911 report; we simply used sales in the three-year period preceding it. Report to the State Board of Equalization for 1911, being official report, produced and marked Defts.' Ex. 26.)

I have taken from the original assessment roll of the townships and municipalities traversed by the track, as near as I could ascertain them from the condensed profile, and entered upon an exhibit, the description, name of owner or occupant, acreage and assessed values; I took them all from the tax roll, using care to see that they were correctly taken off. The list begins at Sault Ste. Marie, mile post 2.80, and runs straight across the state, with the exception of a few cities and villages. (Tabulation marked Defts.' Ex. 27.) The list is so made that I can divide the different sections into the different municipalities.

Q. What have you done towards or in the way of affecting the assessed values with the percentages indicated by the Tax Commission's investigations for the different townships in which the descriptions lying along the right of way appear?

A. I simply totaled the assessed valuation for each municipality as shown here, grouped by mile posts, and applied the percent-

808 ages which I have just read into the record, or the per cents which I have read into the record, to such assessed valuation, and then, in that way, determined an actual value, and that actual value I have divided by the total acreage affected, and determined from that an acreage price for each municipality. I may have two divisions of acreage and acreage prices for one municipality, but it is assembled by mile posts. What I tried to do is to reduce the figures for a township to a total, embracing only the descriptions abutting on or lying adjacent to the railroad; if I didn't, it is in exceptional instances.

A summary of the assessments that appear later in Ex. 27 shows, by columns, county, civil division or municipality, South Shore mile posts, value per acre, based on Tax Commission's per cents, that column being subdivided to show acreage prices assessed, and actual prices based on percentages. Ex. 27 shows, for each township assessed, the value of the lands taken, and the actual value, found by applying the Tax Commission percentages, as reported to the State Board of Equalization, to the assessed value.

This summary comprises the first four sheets of Defts.' Ex. 27; the fifth and sixth sheets show the counties, percentages of assessment in townships, the acreage that enters into the computation, its assessed value, the average assessed value of the acreage, and the actual value as determined by the application of the percentages to the total assessed value; that is also indicated by mile posts, and the average actual value per acre for the county is shown. I find the actual value per acre by counties, produced in that way, to be:

Chippewa	$8.05
Luce	7.54
Schoolcraft	5.01
Alger	6.84
809 Marquette	9.18
Baraga	11.15
Houghton	15.12
Ontonagon	12.85
Gogebic	12.67
Mackinaw	7.07

The computations on pages 1 to 6 inclusive of Defts.' Ex. 27 are my own, and I believe they are correct. Page 7 is the actual detail from which is made the information shown on the summary, comprising the descriptions and values taken from the local rolls, from the exhibit; the amounts arrived at as the value of the lands along the South Shore, computed through the use of the percentages used, are:

Civil division.	Mile posts. From—	Mile posts. To—	Value per acre based on tax com. per cent. Assessed.	Value per acre based on tax com. per cent. Actual.
Chippewa County (main line):				
Sault Ste. Marie City	2.80	4.10	$12.70	$17.48
Sault Ste. Marie Township	4.10	8.25	6.27	10.50
Bay Mills Township	8.25	9.20	6.25	12.50
Sault Ste. Marie Township	9.20	12.15	5.22	8.75
Brimley Station	12.15	12.70	....	....
Sault Ste. Marie Township	12.70	28.85	4.65	7.79
Superior Township	28.85	39.20	6.84	10.42
Sault Ste. Marie Township	39.20	45.48	4.09	6.86
Marquette County (main line):				
Chocolay Township	139.66	151.95	2.60	5.22
Sands Township	151.95	152.10	2.50	5.23
Marquette City	152.10	156.55	....	....
Marquette Township	156.55	159.75	5.72	16.38
Negaunee Township	159.75	163.45	1.86	7.04
Negaunee City	163.45	....	....	....
Ishpeming City	....	172.00	....	....
Tilden Township	172.00	174.05	2.98	8.73
Ely Township	174.05	180.35	3.25	6.79
Humboldt Township	180.35	184.30	5.47	13.13

Champion Township	184.30	187.30	5.00	8.93
Michigamme Township	187.30	193.20	2.62	8.31
Michigamme Village	193.20	193.66	....	....
Mackinaw County (St. Ignace branch):				
Moran Township	1.30	3.75	3.30	9.13
St. Ignace Township	3.75	4.65	3.60	6.70
Moran Township	4.65	8.05	2.03	5.61
Brevort Township	8.05	10.20	3.74	10.54
Allenville Station	10.20	11.20	....	....
Brevort Township	11.20	19.00	3.05	8.59
Moran Township	19.00	24.39	2.08	5.76
Marquette County (south track):				
Marquette Township	2.80	3.30	6.00	17.18
Sands Township	3.30	3.55	5.96	20.92
Marquette Township	3.55	6.60	4.83	13.85
Negaunee Township	6.60	9.75	2.74	9.95

Average by Counties.

Mile posts. From—	Mile posts. To—	Tax commission per cent.	Acreage.	Assessed.	Average per acre.	Actual value.	Average actual value per acre
Marquette County (main line):							
139.66	151.95	49.80	2,264.50	$5,890	$2.60	$11,827	
151.95	152.10	47.80	160.02	400	2.50	8,368	
156.55	159.75	34.90	873.51	4,995	5.72	14,312	
159.75	163.45	27.50	1,433.92	2,775	1.86	10,090	
172.00	174.05	34.10	362.52	1,080	2.98	3,167	
174.05	180.35	47.80	2,120.00	6,885	3.25	14,403	
180.35	184.30	41.70	1,068.77	5,850	5.47	14,028	
184.30	187.30	56.00	952.87	4,765	5.00	8,508	
187.30	193.20	31.50	1,377.55	3,604	2.62	11,441	
Marquette County (south track):							
		34.90	160.00	960	6.00	2,751	
		47.80	73.78	440	5.96	920	
		34.90	951.92	4,600	4.83	13,181	
		27.50	1,580.00	4,325	2.74	15,727	
Total Marquette County...			14,021.36	$46,569	$3.32	$128,723	$9.18

THIS PA
VERTIC

E BOUND
L IN BOOK

Mackinaw County (St. Ignace branch):

32.62	34.15	45.35	360.00	$1,680	$	$7,888	
24.35	19.00	36.17	2,361.44	4,920		13,602	
19.00	11.20	35.48	3,973.34	12,105		34,117	
8.05	10.20	35.48	521.03	1,950		5,496	
4.65	8.05	36.17	993.05	2,015		5,570	
3.75	4.65	53.71	200.00	720		1,341	
1.30	3.75	36.17	707.15	2,335		6,455	
	Total Mackinaw County...		9,116.01	$45,725	$5.02	$64,469	$7.07

812 I have made a compilation of sales of lands along South Shore right of way. These sales were taken from the offices of the Register of Deeds, and part of them by the men of the Tax Commission, and part of them were furnished me later by Registers in certain counties. The sales cover, in general, from 1907 to late in 1911. A part of the sales that were gathered by the Tax Commission men were gathered during their work in preparation for the State equalization in 1911, and, so far as I had opportunity, I got sales from other Registers to supplement those sales and bring them up to date.

Where sales indicated on their face that they were either family or dollar considerations, they were thrown out. The Tax Commission sales had been verified, investigated and examined. I have compiled the sales by townships and counties along the railroad, arranging them in two belts, the first five miles on each side of the track and the second one mile on each side of the track; the sales are all of rural property. (Compilation marked Defts.' Ex. 30.)

By Defts.' Ex. 30 I arrived at $30.97 per acre for lands in Sault Ste. Marie Township; the sales in that township were in 47-1, which is close to, and in part in, the city; the furthest distance from the city of those descriptions is two miles, and some of them are right up to the limits. In the results in Defts.' Ex. 30 no attempt was made to separate the transfer into buildings and lands; by taking one or two buildings, it will materially increase the average figure, depending on the number and size of the descriptions, price, cost of improvement, etc. There is nothing in the exhibit or transfers to show whether the land is improved.

(Proceedings of the State Board of Equalization, 1901 and 1906, contained in printed publications of the State, produced,
813 marked Defts.' Exhibits 31 and 32, and offered in evidence.)

Mr. Wykes: I produce copies of acceptance of land grants by the Bay de Noquet and Marquette Railroad Company, by the Marquette and Ontonagon Railway Company, and No. 3 is the Houghton and Ontonagon Railroad Company.

Mr. Eldredge: The plaintiff admits that they are correct copies of the documents which they purpose to represent, and objects to them on the ground of irrelevancy and immateriality.

(Papers referred to marked Defts.' Exhibits 33, 34 and 35.) Ex. 33 acceptance by Bay de Noquet and Marquette, contains the following clause:

"Resolved, That the Bay De Noquet and Marquette Railroad Company do hereby accept the lands, franchise of rights and powers and privileges, conferred upon said Company by an act of the Legislature of the State of Michigan Entitled, An Act disposing of certain grants of land made to the State of Michigan for Railroad purposes by act of Congress approved June 3, 1856, approved February 14, 1857, and the said Company do hereby agree and assent to the provisions and requirements of all the terms and conditions and provisions imposed by the same."

Defts.' Ex. 34, acceptance by Marquette and Ontonagon, contains the following paragraph:

"That the Marquette and Ontonagon Railway Company does hereby accept the lands, franchises, rights powers and privileges conferred by an act of the Legislature of the State of Michigan, entitled an act disposing of certain grants of land made to the State of Michigan for Rail Road purposes by act of Congress, approved June 3, 1856, approved February fourteenth A. D. 1857, and that said Company hereby agrees & assents to the provisions and requirements of said act."

(Defts.' Ex. 35, acceptance of Houghton and Ontonagon Railroad Company.)

I have made an abstract of the reports of the South Shore Land Co. in the office of the Secretary of State for the years 1904
814 to 1913 inclusive. That abstract takes all the figures reported, and is correct. (Paper marked Defts.' Ex. 61—three sheets.)

On April 25, 1914.

PARKER recalled.

Further direct examination.

By Mr. Wykes:

The Iroquois Hotel site at the Soo was about one-eighth of a mile east of the South Shore station, on Portage Ave., and towards the business part of town—nearer the business part of town than the station.

(Mr. Wykes produced a copy of a printed report of the State Boards of Tax Commissioners and Assessors for the years 1911-1912, which was marked Defts.' Ex. 62.)

(The printed copy of the report of the Mackinac and Marquette R. R., found on page 77 to 88 of the printed report of the Commissioner of Railroads for 1887, and covering the period from Oct. 20 to Dec. 31, 1886, is marked Defts.' Ex. 63.)

(Defts.' Exhibits 53 to 63 inclusive offered in evidence, subject to the previous objections of Mr. Eldredge, who further objects to Defts.' Ex. 63 as irrelevant and immaterial, and also that the paragraph headed "remarks," on page 78, is not a part of the railroad company's report at all, and that, therefore, the language has no tendency to prove the facts therein stated.)

(Mr. Wykes produced the printed annual report of the Commissioner of Railroads for 1889, covering the year ending Dec. 31, 1888, and, subject to Mr. Eldredge's objection to it as irrelevant and immaterial, read from page xlvi thereof, as follows:)

815 "Duluth, South Shore & Atlantic was not inspected until October. The Mackinaw and Marquette division of this line has never been remunerative, and the long stretches of swamp through which it runs, where there is no ballast, has made it difficult and expensive to keep up. It has been built long enough so that bridges, culverts, and ties need renewing, and all need it now.

Many repairs had been made, and were still being made, so that the track is now safe. With the present energetic management it is believed that a more favorable report will be due next year.

"The M. H. & O. division and the Marquette & Western portions of this line are in much better condition and the public have little cause for complaint.

"The new line from Nestoria to the State line was built by contract, and was not constructed as well as railroads usually are by parties who expect to operate them. Under the present efficient management, however, the road has been improved to a large extent, and has been done in a very substantial manner. The road is now safe and the track is in excellent shape for a new line through what was a little more than two years ago an unbroken forest. The road forms a part of a through route from Duluth to the seaboard, and will be an important factor in the question of transportation from the northwest to Atlantic ports."

(Mr. Wykes produced a certified copy of the stenographic reports of the several hearings in review of the property of plaintiff before the State Board of Assessors, for the years 1903, 1904, 1905 and 1907, which was marked Defts.' Ex. 64. Mr. Eldredge objects, on the grounds that they are arguments made by an attorney in the course of his emploment, that they are not proved, and that they have no evidential force, since they could only be proved by the man who took the notes being produced and an opportunity given for cross examination.)

Mr. Wykes: From Defts.' Ex. 26, pages 129 to 131, I wish to read into the record the statement of Mr. F. H. Vandenboom before the State Board of Equalization, representing Marquette County.

Mr. Eldredge: I object to that, for the reason that the statement is obviously self-serving, that it is pure hearsay, and that it has no tendency to prove values, and that it deprives us of the power of cross examination.

816 The Master: Do you claim that this is competent evidence to prove the value of these lands in connection with this case?

Mr. Wykes: I do claim, your Honor please, where a railroad company puts in value for its property by paid experts, and on the behalf of the State other values are shown, and where they widely differ, you can take the statements of officials made in official capacity for the purpose of confirming one or the other, where it is a general proposition, as this is.

Mr. Eldredge: Who do you refer to when you talk about "paid experts?"

Mr. Wykes: I refer to any expert who is paid—Mr. Riggs, for example, or whoever else was called.

Mr. Eldredge: I will put on record that we will not claim anything for the value of land on account of Mr. Riggs' statements.

Mr. Wykes: At least, they will be admissions against you, and I intend to use them as such. Mr. Riggs' statements on certain of this land I intend to use as admissions by the railroad company.

(Mr. Wykes reads into the record the statement of F. H. Vanden-

boom before the State Board of Equalization. The statement is found on pages 129 to 131 of Defts.' Ex. 26. The following is an excerpt therefrom:)

I represent Marquette—at least, the eastern portion of it—and am not here to plead poverty nor to appeal for mercy. We come before this Board simply to show something of our actual values in at least the eastern end of Marquette County. I have no idea how the State Tax Commission arrived at the large values that they have put on the agricultural land, the cities, and the timber part of our county.

I have lived in Marquette County for 39 years, and know something of it, except the mines. About 25% of our land still contains standing timber, about 40% is cut-over, about 30% is rock and sand plains, and about 5% is agricultural land. I have made a careful estimate of the agricultural land, and only one-fifth of it is under cultivation. We have chopped-over land there for settlers,
817 and we hope to get them in, but will not be able to do so by doubling or tripling the valuation.

In getting at values, I have figured the farm land roughly at $10 an acre, because you can buy farm lands anywhere in the near vicinity of the larger towns or cities at that price, and the lands farther back that are tillable are held at only half that price. I have tried to bring this value up, to see if I could get it anywhere near the Tax Commission, but I have utterly failed.

On our rock and sand plains, I have figured those lands at $3.33 an acre, which would give us a value on those lands of $1,000,000. I daresay any man with half a million can take them. They are not valuable for any purpose, so far as I know, except to build a road across, to haul the products to somewhere else. The 40% of cut-over lands we have put at $5 an acre, or $2,000,000, as their actual value. Now, I think we have figured thoroughly high when we placed those cut-over lands at $5 an acre, and lots of it has been bought at $5 an acre and sold over again for the same money, and, in lots of cases, less. The 25% of timber land I have figured at $10 an acre, or $2,500,000, taking them together, whether near to or far from the railroad. This is fairly high, as the timber on it is mixed.

The city of Marquette is assessed at $6,700,000, and I daresay, if you took from it the city hall, the court house, and its churches, that the whole city could be bought for that money, for I know of several instances where property has been sold for exactly what it was assessed for, and in some cases less. I sold a small piece of property for $1,000 which was assessed at $1,000. Another good location sold last year for $750, while it was assessed at $800. Lots within a fourth of a mile of the post office, which were held a few years ago at $800, can now be had for $500.

The Tax Commission figures may be based on sales made for speculative purposes. For instance, I bought property at about $7.50 an acre and sold it for $30 to $50, to the Longyear and Ayers estate. They had to have it, but their scheme has now fallen through, and I bought property adjoining it for $10 an acre. I

bought 80 acres of land—40 of which had timber, and 40 of which cost the owner $2,500 to clear—for $500 for the 80 acres.

I will say to this Board that all we want is to be justly equalized and fairly treated; but, in regard to values, I will say that the Tax Commission has put our values entirely too high, because the value is not there. Now, some people have come in since I have been there and said that it was the Supervisor's business to keep his tax roll down as low as possible. This is not true of the Upper Peninsula.

The Supervisor has made an effort to keep his tax roll sufficiently high so one-half of 1% which he could raise for highway purposes would give him sufficient money for highway work, and the farmers are particularly anxious that they should raise a reasonable
818 sum for highway purposes, because nearly all the work, until the county road system came in, has been done by the farmers; so the farmer is perfectly willing to pay his share of an increased valuation, in order to make the land companies that own the bulk of the land pay their share, and he gets the entire amount of highway taxes back in his own hands by doing the labor when he has tome to do it. It is just like having it handed over, and so the Supervisor in the Upper Peninsula makes an effort to have his tax roll as high as possible. In fact, the tax roll of my own township has stood for years at approximately $200,000. Only a few years ago, there were several thousand acres taken off from our township to form what is known as Buell Township. Not one cent went off from our roll. We immediately raised the timber lands and farming lands sufficiently to still leave our roll at approximately $200,000.

I counted $500,000 for the farming land, which I think is ample. I think that the Tax Commission's estimate on our county is 100% more than the property is worth.

On May 5, 1914.

PARKER recalled.

Further direct examination.

By Mr. Wykes:

I asked Mr. McCormick to prepare the figures which he gave in his testimony, showing the operating ratios and the expenses under the different general classifications for the different railroad systems that he enumerated. I directed him to take system figures for other roads or systems than the South Shore, because we don't place any dependence on the division of operating expenses and earnings. They are not in a uniform manner, and there was one figure that we could depend on, and that was the system figure. The divisions to states are not made uniformly or on the same basis in the different reports.

I have never had all the data necessary to ascertain what the real expenses in Michigan were where the road was in different states. Here, in our work, the law requires that we are guided by track mileage in Michigan, and we use that as a rather rough and ready method

of dividing the earnings and expenses to Michigan for our
819 purposes, here. Occasionally, the different reports state the basis of the division of these operating expenses between Michigan and other states. Some of them have been done on a track mileage basis, and others on a revenue train mileage basis; others are stated merely as proportional, without stating what the proportion is; then, again, others do not say what the method is.

At your request, I have prepared a table of figures, from the South Shore reports for various years, showing the amounts expended for labor, and the averages paid employees. The data was taken from the reports to the railroad commission for the years 1908 to 1913 inclusive. The compilation shows the number of men employed, and the days worked, the compensation paid, and the average per day, for each of the years mentioned, subdivided further as to the classification of operating accounts to which these men were supposedly charged—really, into five grand divisions of the operating expense account, although they have included one other in some of the years, being outside operations. The figures which I have compiled are as follows:

Account.	Number of men.	Days worked.	Compensation.	Average per day.
1908:				
Maintenance of Way & Structures	433	158,730	$281,837.51	$1.78
Maintenance of Equipment	317	116,885	235,578.45	2.02
Traffic Expenses	3	962	3,840.00	3.99
Transportation Expenses	741	265,994	675,786.30	2.54
General Expenses	67	23,624	79,264.21	3.36
Outside Operations	...	.....	.....	....
	1,561	566,195	$1,276,306.47	$2.25
1909:				
Maintenance of Way & Structures	359	131,240	$213,513.60	$1.63
Maintenance of Equipment	293	107,129	218,693.59	2.04
Traffic Expenses	3	1,022	4,020.00	3.93
Transportation Expenses	641	229,297	578,557.22	2.52
General Expenses	65	23,213	79,131.63	3.41
Outside Operations	28	9,900	17,081.05	1.73
	1,389	501,801	$1,110,997:09	$2.21
1910:				
Maintenance of Way & Structures	527	160,913	$269,052.46	$1.67
Maintenance of Equipment	339	120,875	251,039.19	2.08
Traffic Expenses	3	1,021	3,933.47	3.85
Transportation Expenses	839	273,775	707,230.97	2.58
General Expenses	67	23,447	77,075.87	3.29
Outside Operations	27	7,793	12,636.88	1.62
	1,802	587,824	$1,320,968.84	$2.25

Account.	Number of men.	Days worked.	Compensation.	Average per day.
1911:				
Maintenance of Way & Structures	495	153,237	$262,643.05	$1.71
Maintenance of Equipment	383	111,199	233,320.38	2.10
Traffic Expenses	4	1,264	5,060.00	4.00
Transportation Expenses	889	262,654	700,738.55	2.67
General Expenses	70	25,484	48,578.45	3.32
Outside Operations	27	7,778	12,444.94	1.60
	1,868	561,616	$1,298,785.37	$2.31
1912:				
Maintenance of Way & Structures	673	166,418	$285,450.85	$1.72
Maintenance of Equipment	402	114,320	240,379.24	2.10
Traffic Expenses	5	1,573	6,110.00	3.88
Transportation Expenses	914	263,400	717,430.53	2.72
General Expenses	72	27,240	80,433.44	2.95
Outside Operations	31	7,720	12,624.89	1.64
	2,097	580,671	$1,342,428.95	$2.31
1913:				
Maintenance of Way & Structures	571	177,407	$327,694.59	$1.85
Maintenance of Equipment	440	126,147	272,390.21	2.16
Traffic Expenses	5	1,703	6,659.04	3.91
Transportation Expenses	1,079	294,382	815,460.73	2.77
General Expenses	61	23,061	61,168.84	2.65
Outside Operations	33	9,555	15,135.71	1.58
	2,189	632,255	$1,498,509.12	$2.37

821 I average the figures for the three years, 1908 to 1910; that was a simple average of the aggregate of the number of days of work of the men in any one of these departments—for instance, say, maintenance of way and structures, by dividing the aggregate compensation by the number of days' work we have the average per day. It is a simple arithmetical average. Then I got an average per day for the whole amount of labor. It is the actual average compensation paid. For 1908, 1909 and 1910, it is the average of 551,940 days for total compensation of $1,236,090; that is really a weighted average. I have prepared the same kind of an average for the three years, 1911, 1912 and 1913. (The witness read compilations into the record, as follows:)

Account.	Number of men.	Days worked.	Compensation.	Average per day.
Average for years 1908, 1909, and 1910:				
Maintenance of Way & Structures	440	150,294	$254,801.19	$1.70
Maintenance of Equipment	316	114,963	235,103.75	2.05
Traffic Expenses	3	1,002	3,931.16	3.92
Transportation Expenses	740	256,355	653,858.16	2.55
General Expenses	67	23,428	78,490.57	3.35
Outside Operations	18	5,898	9,905.97	1.68
	1,584	551,940	$1,236,090.80	$2.24
Average for years 1911, 1912, and 1913:				
Maintenance of Way & Structures	580	165,687	$291,929.50	$1.76
Maintenance of Equipment	408	117,222	248,696.61	2.12
Traffic Expenses	5	1,513	5,943.01	3.93
Transportation Expenses	960	273,479	744,543.27	2.72
General Expenses	68	25,262	75,393.58	2.98
Outside Operations	30	8,351	13,401.84	1.60
	2,051	591,514	$1,379,907.81	$2.33

822 PARKER.

Cross-examination.

By Mr. Eldredge:

My directions to Mr. McCormick were simply to get representative railroads of Michigan, and to take the system figures only, with the exception of South Shore. The D. C. & W. has only been operating about two years, and transportation expense would be about the only normal expenses which it had. The D. T. & S. L. runs from Detroit to Toledo. Its traffic is entirely freight, and it has a good tonnage. It is not a road that ought to be compared with normal roads, unless you were using all of them together, possibly, to get a representative system out of them.

I averaged the expenses of employees by taking the three years and aggregating the days' work and the compensation, and then divided those aggregates, which gave me the average per day. That average is a weighted average, because it isn't applicable so much to the one group of laborers, but is the actual true average of the wages paid to all of the men.

On June 4, 1914.

PARKER recalled.

Further direct examination.

By Mr. Wykes:

I assisted in the preparation of Defts.' Ex. 72, Thompson, from inception to conclusion. I assisted in procuring the data, working the ratios and applying the method of Mr. Thompson, having a hand in and knowledge of every step. Ex. 72 correctly carries out the Thompson plan or method for the division of expenses as applied to plaintiff's accounts.

I have just (June, 1914) completed an investigation of plaintiff's books, to procure data to apply the same plan to the accounts of plaintiff for the year ending June 30, 1913. I have worked
823 out the ratios necessary in the application of that plan to the accounts of 1913, giving the same numbers to the same ratios as in 1912. I followed, throughout, substantially the same method as was applied in 1912, and, where I deviated from that method, I will mention it; otherwise, it will be the same as in 1912.

The gross ton miles were obtained as in 1912, except that in 1913 we had access to the individual locomotive mileage in Michigan, and used the individual mileage against the locomotives making it, whereas, in 1912, by reason of having the system mileage of locomotives, the locomotive ton miles was determined by average weights. In other respects, the computation of the gross ton mile ratio was the same in 1913 as in 1912, with the exception that in 1913 there was no computation for mileage on the Mineral Range.

The reason for making the computation for mileage on the Mineral Range in 1912 was that there was three months' operation of those tracks, the mileage of which was included in the mileage of South Shore trains. The contract changed about Oct. 1, 1912, and no mileage has been computed for the Mineral Range since. During the three months of 1912, plaintiff paid for the operations of those trains and received the revenue; subsequently, it paid for the operation of the trains, but did not receive the revenue.

Plaintiff does receive what you might call wheelage, or track rental; that is received from the C. & N. W. and C. M. & St. P. for mileage on its tracks and the Mineral Range. Plaintiff now absorbs any other revenue from those sources. During the three months of 1912, and before, plaintiff paid the Mineral Range 40¢ a train mile.

For Ratio 2, where in 1912 we made allocations and assignments of the track, in 1913 we took Complt.'s Ex. 1*a*, Riggs, and used the Riggs allocations bodily. In 1913, we accepted Riggs' allo-
824 cations of exclusive ore track; in 1912, it rested on my judgment, which was arrived at by inquiry of operating officials regarding the character of traffic on the various branches and the fact that I had known a good deal of the character of the traffic on these branches from being in this case. I considered as ore mileage in 1912 the mileage from Eagle Mills to Winthrop Jct., on the south track, traffic spurs of 15.55 miles which I cannot now definitely locate (which compares with 16.05 of Riggs for 1913 in Complt.'s Ex. 1*a*, Riggs), and joint spurs of 1.59 miles, as compared with Riggs' 1.37 miles—a total mileage, in 1912, of 25.47, while Riggs' total is 26.25. This is main line, branches and traffic spurs. Of the sidings, I included 21.72 miles in 1912, while Complt.'s Ex. 1*a* shows 31.84.

In arriving at Ratio 4 for 1913, we applied the same percentage for delay by passenger trains to freight trains as was computed by Mr. Thompson for 1912, namely, 2.75%. We deducted the 2.75% from the time of the freight trains.

Ratio 8. Plaintiff's records in 1913 show the actual interstate and intrastate revenues for Wisconsin, and I availed myself of those figures, which produced the ratio I have for 1913. The 1912 explanation on Ex. 72 shows how it was arrived at for that year.

Ratio 11 is different in 1912 from 1913, in that in 1913 there was no deduction in passenger train mileage made on Mineral Range.

Ratio 13 was determined in the same manner in both 1912 and 1913. On the basis of the total yard and road switching in Michigan being 100%, it subdivides to passenger 3.41% and to freight 96.59%. This was obtained on the basis of time as related to the activities of the various yards in which switching was done.
825 We observed St. Ignace, Marquette and Houghton yards, took notice of the number of passenger trains for which any switching was done at these points, took observation of what would be a liberal amount of time devoted to that work, aggregated the time, converted it into miles upon the factor of six miles per hour, and determined therefrom the total number of miles which would be made in such operations at each yard.

In arriving at the passenger percentage, we observed the movements of the passenger trains requiring or receiving switching in the various yards, applied to each of those movements an amount of time in our judgment more than proper, reduced the same to miles on the basis of six miles per hour, and then deducted from the total yard switching.

The 1913 percentages for Ratio 13 were based upon the 1912 and 1913 observations, being applied to the train movement of 1913. The percentages for passenger switching, as given by me for 1912 and 1913, of 3.40% and 3.90%, represent, in my judgment, a sufficient amount for passenger service. If there is any error, it is against us,—against the passenger side of the case,—by reason of drawing a greater percentage into passenger switching than actually exists. The freight switching entering into this ratio includes no road switching before one full hour is reached at any single point of switching.

Ratio 13*b* depends upon actual observations at individual yards.

The several ratios, 1 to 17, in Defts.' Exhibits 72, Thompson, and 77, Parker, are, as described therein, true ratios of the things they purport to be.

826 PARKER recalled.

Further direct examination.

By Mr. Wykes:

Q. Will you produce, Mr. Parker, the annual reports of the Association of Railroad Commissioners for the years 1891, 1892 and 1893?

A. I have these reports, 1891, 1892 and 1893.

Q. Taking the report for 1891, will you read the action and discussions of the Association of Railroad Commissioners with reference to the revenue train mileage basis for the apportionment of common expenses between passenger and freight?

Mr. Eldredge: I object to it as irrelevant and immaterial, and also that it pretends to be nothing more than a report of the proceedings of certain railroad commissioners, and that any statement that they might have made is not admissable in evidence and can only be proved by them and an opportunity given for cross-examination.

Mr. Wykes: The theory of using this, your Honor, is that in plaintiff's proof it appeared that the I. C. C. had in force for a long time the method of division of operating expenses on the revenue train mileage basis, but afterwards they abandoned it. Now, the abandonment was brought about through this action of the Association of Railway Commissioners, and I think under the entire proof it is a necessary part of that history, and I assume the Master will let this go in subject to Mr. Eldredge's objection, so you may read, Mr. Parker.

Mr. Eldredge: I wish to make this further objection, having

listened to Mr. Wykes' statement, that, even if it be true, the statements of a commissioner, or the proceedings of the Association, are not admissable in evidence, upon any theory, for the reason that the views and statements should be proved by the parties, and
827 they should be subject to cross-examination.

The Master: Do you propose to connect this discussion of the Railroad Commissioners with the action of the I. C. C. in abandoning the basis that you speak of?

Mr. Wykes: It has been connected by Prof. Adams and, I think, by Mr. Delf. But these documents have not gone in, and, you remember, Prof. Adams tried to give extracts, and Mr. Butler objected, on the ground that the books themselves were not produced and that Mr. Adams was giving extracts, and I am now producing the whole of the documents, in answer to Mr. Butler's objection, so as to furnish the whole thing. First, Mr. Luther, mark those three books defendants' exhibits; 1891 will be 94 (should be 66). I make the whole report as exhibit, and then, if Mr. Eldredge wants to refer to anything that I don't use, it is in the record, where he can do it. 1892 marked Defts.' Ex. 95 (should be 67), Parker, June 2, 1914; 1893 marked Defts.' Ex. 96 (should be 68), Parker, June 2, 1914.

Q. Now, Mr. Parker, you may proceed to read in evidence the extracts pertaining to the revenue train mileage basis which you find in each of the reports marked exhibits 94 to 96 inclusive, but which should be Defts.' Exhibits 66, 67 and 68.

From the report of the Committee on Uniformity of Railway Accounts, page 96 of the Proceedings of the Third Annual Convention of Railroad Commissioners, 1891:

"* * * The second proposition of the executive committee is to discontinue the division of expenses between passenger and freight and to abandon all efforts to ascertain the cost per passenger
828 per mile of the passenger traffic and the cost per ton per mile of the freight traffic, because the results obtained are only approximate, unreliable, and misleading. It is admitted and distinctly stated in the instructions accompanying the form of returns that the results obtained by the present method of apportionment are, and in the nature of the case must be, only approximate. It is difficult and perhaps impossible to determine just what proportion of the cost of maintenance of way and structures, which constitutes about twenty per cent of the total operating expenses, is properly chargeable to passenger and freight traffic respectively, and the same is equally true of many of the items under each of the different heads of operating expenses. A very considerable per cent of the total operating expenses can probably be definitely determined as properly chargeable either to passenger or freight traffic.

We think, however, that the present apportionment, on a basis of train mileage, of those expenses which cannot thus be definitely determined, generally gives a close approximation to the actual cost; and, while we would cheerfully recommend the adoption of any method which would give a more accurate result, we are reluctant

to advise the abandonment of all attempts to obtain the best information possible upon the subject. Furthermore, we believe that withholding from the public all information upon this subject is more likely to result in adverse and unjust legislation than to publish the best results obtainable, as is now done. In other words, legislation founded upon the best approximation to the truth which can be devised is less likely to be harmful to the railroads than that which is founded upon entire ignorance of the subject. Inasmuch, however, as the committee which had in charge the arrangement of the program for this Convention has assigned as a topic for special discussion the 'Apportionment of Expenses to Freight and Pas-
829 senger Traffic,' your committee does not feel like making final recommendation on this subject. This question, therefore, may properly be regarded as in the hands of the Convention itself. * * *.

WM. O. SEYMOUR.
ISAAC N. PHILLIPS.
ISAAC B. BROWN.

The Chairman: The report will be considered as adopted, if there is no objection. It is now before the Convention. I would inquire if representatives of the American Association of Railway Accounting Officers are present, and whether they would like to be heard at this time.

Mr. Riebenack: If it is in order I would like to make a few remarks with regard to that feature of the report which relates to the attempted division of expenses between freight and passenger business of railroads. I have given the subject considerable attention, and will only detain you a few moments to present what I think is the experience of all accounting officers.

I do not believe that anything now can be said in regard to the impracticability of arriving at reliable data for determining accurately the division of expenses between passenger and freight business in operating a railroad.

It has been a favorite idea with all the prominent lines in existence to arrive at some basis for so dividing their expenses, and the endeavor to accomplish this result has fully taxed the ingenuity and abilities of managers. The field has been well plowed and much seed sown, but the harvest has been barren, so far as any generally satisfactory conclusions are concerned.

830 In giving you some reasons for the cause of the failures, and in demonstrating the impracticability of attempting it in any manner so as to produce a basis universally applicable, I do not pretend to give any new thoughts, but merely to bring to your attention, in as plain a manner as possible, what has been attempted and what is being done, and to prove that the results reached are purely of local utility.

It is a recognized fact that only about 40 per cent of the expenses of a railroad divide themselves naturally as between the two great sources of revenue—freight and passenger—leaving about 60 per cent to be disposed of arbitrarily.

Five methods for accomplishing this have come to my knowledge, as follows:

First. Miles run by freight and passenger locomotives respectively.

Second. Miles run by freight and passenger trains respectively.

Third. Gross freight and passenger earnings respectively.

Fourth. Mileage of freight and passenger cars respectively.

Fifth. Freight tonnage mileage and passengers moved one mile.

With the first two of these I am most familiar, as it has been the basis for the past twenty-five years on which the company with which I am connected has allotted its expenses common to both passenger and freight business and not wholly chargeable to either.

The respective mileage is taken of the freight and passenger locomotives hauling the trains, regardless of whether the cars are few or many, loaded or empty.

831 Mileage of locomotives running mixed trains is allotted between freight and passenger mileage on the basis of the mileage made by exclusively freight and passenger locomotives.

The road is divided into three grand divisions, and a separate record of freight and passenger locomotive mileage is kept for each grand division. Separate records are also kept for the various subdivisions and branches under each grand division.

The percentages vary each year, and instructions are issued annually of the percentages on which the expenses common to both freight and passenger traffic are to be divided, based upon the previous year's mileage. To show you how they vary on the different divisions, take the line from New York to Pittsburgh, which is divided into four divisions, the first division from New York to Philadelphia; such expenses in 1890 were divided ½ and ½ each; from Philadelphia to Harrisburg, 7/10 freight and 3/10 passenger; Harrisburg to Altoona, 8/10 freight and 2/10 passenger, and Altoona to Pittsburgh, 7/10 freight and 3/10 passenger.

On the Philadelphia and Erie railroad the expenses of the entire three divisions are divided 8/10 freight and 2/10 passenger, it being principally a freight road.

On our Philadelphia, Wilmington and Baltimore railroad from Philadelphia to Baltimore the expenses are divided 4/10 freight and 6/10 passenger.

On the Camden and Atlantic railroad the passenger traffic largely predominates, the expenses being divided 2/10 freight and 8/10 passenger.

On the West Jersey railroad the expenses are divided 3/10 freight and 7/10 passenger.

832 This method is perfectly satisfactory to the officers of my company, and having been kept for so long a period it has added importance yearly as comparative information, measuring the efficiency of officers in operating, and producing economical administration; but it is clearly understood that it is not available in determining any policy affecting the making of rates, for the reason that the basis is abitrary, without solid principles as a foundation, and serves our purposes only as a gauge to keep expenditures within established bounds.

The second basis, miles run by freight and passenger trains respectively, is the one laid down by the Interstate Commerce Commission, with the proviso that for mixed trains the assumed ratio be ¾ freight and ¼ passenger.

This basis is arrived at by the assumption that the heavier weight of the freight train is offset by the higher speed of the lighter passenger train. While such a rule might apply to a few roads it cannot be made applicable to all railroads, as there is a wide difference between the relative weight of the freight and passenger trains to each other in different parts of the country.

All attempts made by railroad scientists in endeavoring to establish relative wear and tear of track and roadbed, as between the speed of fast express trains and the heavy weight of freight trains, have been clouded with doubts, and the various conditions of grade and location made any conclusions on one line of no value with another.

The third plan, dividing expenses in proportion to the gross freight and passenger earnings respectively, is no guide whatever, for the reason that in the same year either one of the classes of traffic may be affected by a reduction in rates that would lead to false conclusions, and be no guide for other years.

833 The fourth plan, division on the basis of mileage of freight and passenger cars respectively, has inequalities, as it assumes that the weight of freight and passenger cars is the same, while the fact is a passenger car weighs twice as much as a freight car.

The fifth theory, that carrying a passenger one mile is the same as carrying a ton of freight one mile, is merely an assumption, and it is not warranted by anything approaching an equitable demonstration.

The cost per ton per mile as now reported is the general average for all classes of freight, obtained by dividing the tons one mile into what has been assumed to be the cost for its movement, while a moment's reflection will convince any one that the expense of handling the various classes must differ as widely as the rates charged. For instance, shipments from New York to Chicago in the six established classes vary from $15.00 per ton to $5.00. One line may carry principally high-grade freight, dry goods, boots and shoes, etc., and another lowgrade freight, like lumber and ore. A general average of cost would therefore have no significance in deducting any conclusions—in fact, could only be misleading in most cases.

The cost per passenger per mile is still further from a fair basis. The passengers one mile are divided into the assumed passenger expenses, without any reference to the fact that the expenses for moving express, mails, and miscellaneous shipments, such as milk, marketing, etc., by passenger trains are included therein.

A low estimate places the cost of movement of mails and express business at about 70 per cent of the receipts, to which should be added all incidental expenses connected with conducting the business of these two important sources of revenue.

834 Another disturbing element which would seriously affect results of cost of movement is the financial condition of a railroad. A prosperous company may decide to charge to its operat-

ing expenses work done on account of betterments, such as substituting stone bridges for iron or wooden ones, rebuilding equipment of engines and cars on more costly plans, replacing old stations with more expensive structures, which would greatly increase the cost of moving a ton of freight or a passenger per mile. Another company of equal financial strength may not include such items in operating expenses, but carry such expenditures direct to 'income account' as 'extraordinary expenses,' while a third, whose reserve finances are not strong enough, would charge them to capital account.

It will be seen, therefore, that the attempts to show the average cost per mile of carrying a ton of freight or a passenger per mile leads us so deep into the field of conjecture as to make the thoughtful pause. When you consider that 60 per cent of the expenses of railroads cannot be divided at all, as between freight and passenger, the results obtained by the following of any arbitrary rule for making such division of expenses cannot be sufficiently definite for practical purposes, and if used as facts for basing legislative action upon them must be unjust and injurious both to the public at large and investors in railroad property. The object of all statistics is to obtain useful information as a guide to beneficial results, and no plan adopted should have any organic faults which may lead to misinformation and erroneous deductions.

Finally, is it so very desirable to have this information for arriving at general conclusions on which to base legal action? Is not the general result of the percentage of operation safer and a more reliable standard, for practical purposes, to judge by?

835 The statistics produced by the Interstate Commerce Commission from the reports of railroads are in most cases so thorough and complete, and their arrangement exhibits such great ability and a broad comprehension of what is desirable to be arrived at, that they may well serve as a model for the states to follow, but it is respectfully and impressively suggested that its valuable results should not be marred by any information that is based on assumption or theory and not demonstrable by clear and indisputable facts.

(Page 112:)

The Chairman: * * * The motion is that this whole subject is left in the hands of the committee that has it in charge, with instructions to report to the next Convention, and that in the meantime the members confer with the Association of Railway Accounting Officers.

Mr. Riebenack: That carries with it a postponement?

The Chairman: Yes sir.

The motion was agreed to."

From the Report of the Committee of Uniformity of Railway Accounts, Proceedings of the Fourth Annual Convention of Railroad Commissioners, 1892:

(Page 17:)

"* * * The two questions which most vitally affect the present form are:

1st. Shall taxes be considered as a fixed charge or as an operating expense? and

2nd. Shall the assignment of expenses to freight and passenger traffic be continued?

(Page 21:)

* * * We are now prepared to consider the second proposition, viz., whether the assignment to freight and passenger traffic should be continued. It is well known that a large proportion of expenses of operation is common to both the passenger and the freight service, but not wholly chargeable to either. Salaries of general officers, station agents, and telegraph operators, expenses of the maintenance of way and structures, and other like expenses, will serve as examples of those outlays which do not naturally divide between the passenger and the freight service. Other expenses there are that classify themselves. What per cent of the entire expense of operation is incapable of being accurately classified is variously stated, the lowest estimate being forty per cent, while some allege the amount to be as high as sixty per cent of the entire expense. This large proportion, expended for the common benefit of both branches of the service must, therefore, if apportioned at all, be divided in accordance with some arbitrary general rule. The rule now used is stated upon page 42, of the Form of Annual Report in these words:

836

'All expenses which are naturally chargeable to either passenger or freight traffic should be entered in their respective columns. Expenses which are not naturally chargeable to either traffic should be apportioned on a mileage, making the division as between passenger and freight traffic in the proportion which the passenger and freight train mileage bears to the total mileage of trains earning revenue.'

'Mixed trains will continue to be treated for the present as one-fourth passenger and three-fourths freight.'

We may observe, first, that the rule referring to mixed trains appears, so far as we can learn, to rest upon nothing more definite or valuable than someone's conjecture, and the identity of the conjecturer seems to be unknown. That it is based upon any experience or upon any theory that finds a basis in the facts of the railway business of the country has never been made apparent. This arbitrary rule, that one-fourth of the expenses of all mixed trains must be charged to passenger service and three-fourths to the freight service, is applied alike to those roads which do a larger passenger traffic and upon which mixed trains are the rare exception, and likewise upon frontier roads where both passenger and passenger traffic is conducted exclusively by mixed trains. There are several roads of the latter class in the State of Illinois, and

837

in the West it may be said generally that freight trains carry a few passengers in the 'caboose.' Whether every train which carries passengers at all would be classed as 'mixed' we do not know, but, certainly, if such trains are so classed, egregiously wrong results would be obtained under this rule, for on the roads of the West many trains carrying a heavy tonnage of freight frequently carry only a very few passengers, whose transportation forms but a mere incident of the entire service of the train.

Without going into a detailed argument, it will appear that the basis so furnished for the division of expenses of mixed trains must be of little value, and, while the volume of 'mixed' service is, perhaps, on the whole not large, it seems to us that either a rule which will produce results substantially correct and true should be found or else the effort to classify the common expenses of mixed trains should not be attempted.

The most obvious test of the rules given for both mixed and distinct trains would be the results of experience in using them. The test of actual practice fails to satisfy us that these rules are of any utility either to the companies, the States, or the nation. Indeed, if not substantially correct, they could not be expected to be useful and may prove positively vicious. We know that results have been reached by the application of these rules for division which are grossly erroneous, not to say preposterous. To illustrate, we
838 quote from certain letters of Stuyvesant Fish, president of the Illinois Central Railroad Company. The first concerns the report of that company for the year 1890. Mr. Fish, writing to Chairman Cooley, said:

'The arbitrary rule laid down by the Commission for the distribution of expenses between the passenger and freight service make it to appear that the Illinois Central earned 372/1000 of a cent per ton of freight per mile and only 34/1000 of a cent per passenger per mile. The case of the Dubuque & Sioux City railroad is even worse, it being made to appear to earn 338/1000 of a cent per ton of freight per mile, while its average receipts per passenger per mile are made to appear to be 273/1000 of a cent less than the estimated cost of carrying each passenger one mile. Obviously, the rule of the Commission charges too much of the expenses to the passenger and too little to the freight service.

* * * * * * *

'Being unable to suggest a safe rule for dividing the expenses, we do not presume to criticise the one adopted by the Commission further than to point out wherein it fails of application to the business of the Illinois Central Railroad Company, and to submit that it is not right to draw conclusions from, or wise to predicate action upon, figures so obviously erroneous.'

And, again commenting upon the Report for 1891, Mr. Fish says:

'The arbitrary rule laid down by the Commission for the distribution of expenses between the passenger and freight service make it appear that the Illinois Central earned during the past year

332/1000 of a cent per ton of freight per mile, and that it lost 77/1000 of a cent per passenger per mile, and that its entire passenger business was done at a loss of $141,715.37.'

Roads could perhaps be found, reporting to the Interstate Commission, whose business is so divided between the passenger and freight service and is performed under such conditions as to render the rule now in use as near right as any general rule that could be devised. Evidently, that rule, as Mr. Fish says, fails of proper application to the business of the Illinois Central Railroad Company; and probably other roads may be found from whose reports,
839 following this rule, it would appear that instead of too much expense being charged to passenger service and too little to freight, as in the case of the Illinois Central Company, it would be found that too much is charged to freight and to little to passenger. We have no such case at present in mind; but the varying conditions under which the railroads of the country do business, and the wide difference in the character of their respective traffics, renders it highly probable that such cases exist and might be found if searched for.

In answer to one of the above letters of Mr. Fish, judge Cooley, among other things, wrote:

'I understand very well that it is absolutely impossible to so apportion the cost of freight and passenger service as to reach accurate results. Nevertheless, if it is desirable to obtain the statistics of the roads at all, they ought to be obtained on the same basis. They would not otherwise be of much value. Our blank reports, therefore, are the same for all the roads.

* * * * * * *

'I may perhaps with propriety add that I can very well see that the application of the rule does not lead to correct information regarding the cost of passenger traffic considered by itself, and if the matter were exclusively in my hands I should probably make considerable change. It is too important a matter, however, to act hastily upon, and I think any action should be taken with the full accord of the Association of Railway Accounting Officers.'

Referring to the statement quoted above from Judge Cooley that 'any action should be taken with the full accord of the Association of Railway Accounting Officers,' it may be noted that the opinions of the railway accounting officers, in the association and out, which have, through the kindness of the statistician, been collected for the use of our committee, are practically unanimous in favor of discontinuing the attempt to apportion expenses between passenger and freight traffics. Thus we have the 'full accord of the associ-
840 ation' which his honor Judge Cooley thought desirable; and while we are aware that railway officials do not always view questions of this kind from the standpoint of the public interests, as it is the duty of railway commissioners to view them, still as regards this matter we are convinced, after full reflection, that the public interest is not antagonistic to that of the companies themselves, and that all the recommendations are made in the utmost good faith.

And this brings us to a consideration of the purpose of requiring this division, which it is admitted must be made, if at all, upon an arbitrary basis. It has been said (and we will meet the case squarely) that the fixing of tariff rates for the transportation of passengers and freights, under governmental authority, is likely to become one of the leading functions of the railway commissions of the country, and that it is therefore desirable that statistics be collected from which can be derived the information called for on page 61 of the commissioner's form to be used as a basis for the fixing of maximum freight and passenger rates. It is said such items as 'estimated cost of carrying each passenger one mile,' 'passenger earnings per mile of road,' 'passenger earnings per train-mile,' 'estimated cost of carrying one ton one mile,' 'freight earnings per mile of road,' and 'freight earnings per train-mile,' are necessary as a basis for the fixing of rates, and should be preserved even though perfectly correct results are not obtained.

Every one will admit that if the items of cost of freight and passenger service above quoted from the form on page 61 could be obtained with substantial correctness the information would be valuable, and it would certainly be quite as valuable for the roads as it would be for the railway commissions or other governmental agencies.

841 But we have not yet arrived at the point of being able to see how a body of inaccurate statistics, which are supposed to support another body of erroneous deductions, can be of practical value to any legislative or executive branch of government, any more than they would be valuable to the companies themselves. It is said a uniform basis must be adopted and maintained to secure the benefit of comparisons; but it is difficult to understand how, if one error is vicious and harmful, an accumulation of errors may become salutary; and it is quite as difficult to see how true statistical instruction may be derived by comparing a large number of errors more or less gross with each other.

We have little share, anyway, in the expectation that just railway rates will ever be established through statistical tables showing 'per mile,' 'per ton,' or 'per passenger' costs. We do not believe that information of this kind ever did furnish the basis for actually fixing tariff rates, or that it ever will, because we believe that, even where railway commissions are clothed with power to fix rates, such rates will be made up upon a different basis and depend upon different conditions from any disclosed by such statistics. Particularly must this be true so long as the cost items per unit of traffic are confessedly erroneous and do not represent the true facts of the case.

So far, therefore, from the statistics obtained from this division being valuable as affording a criterion for railway rates, we believe that the very fact that this false information is liable to be so used is the more cogent reason which could be given for ceasing to furnish a basis confessedly erroneous. A man who travels in the wrong direction is certainly as likely never to arrive at his destination as one who travels not at all.

842 By all this we do not mean to be understood as saying that unless absolutely correct and accurate information is obtained the attempt to classify expenses should be abandoned. We do, how-

ever, mean to say that unless a result which is substantially and approximately correct can be had, it is better to leave the subject untouched, and to permit (if a cost criterion must be had) the statistics of each road to be estimated separately and in the light of its own conditions of traffic, and to be so estimated by those who may have the rate-making power.

In the somewhat lengthy investigation we have made in this matter one fact has arisen to a position of absolute clearness in our mind, which is that no universal or uniform basis of such division of expenses will ever yield statistical results near enough correct to be of practical use, or, indeed, not to be positively harmful.

When we consider that the proposed division of expenses must be made on, say, some coal road of Southern Illinois which hauls an occasional passenger, by the same rule and upon the same basis which is applied to a passenger road connecting New York and Philadelphia or Philadelphia and Washington, what possible value can be expected in results so obtained?

If it were possible in the case of any single road to arrive at a correct rule for apportionment of operating expenses, it would remain doubtful whether the rule thus found would be applicable to any other road doing business in the country, and certainly it could never be applied to any considerable number of other roads.

Your committee also approve and would recommend the transfer of the items mentioned in the 'Suggestions' from 'General Expenses' to definite accounts, under the head of 'Conducting Transportation,' thus necessitating the introduction of some new accounts
843 under that heading, such as 'Superintendence,' 'Hire of Equipment,' 'Clearing Wrecks,' 'Oil, Tallow and Waste,' 'Outside Agencies and Advertising,' 'Commissions,' 'Stationery and Printing,' etc.

It is impossible to enumerate in detail all the minute changes suggested and to give the reasons therefor in this report without extending it beyond reasonable limits, but your committee recommend the adoption of the changes in the 'Classification of Operating Expenses' suggested by the executive committee of the Association of American Railway Accounting Officers, as shown in a copy of said suggestions filed with this report. If this Convention should see fit to adopt, in whole or in part, the recommendations of the committee, it is suggested that the changes shall not take effect until for the year ending June 30, 1893.

We desire to express our gratitude to the executive committee of the American Railway Accounting Association and to the statistician of the Interstate Commerce Commission for their valuable assistance in the discharge of our duties.

With the submission of this report your committee respectfully ask to be discharged.

WM. O. SEYMOUR.
ISAAC N. PHILLIPS.
ISAAC B. BROWN.

The Chairman: The Convention has heard the report of the Committee on Uniformity of Railway Accounts. What disposition is the pleasure of the Convention?

Mr. Becker: I move that the report be accepted and the committee discharged, and also that the report be laid on the table for
844 future consideration.

The motion was agreed to.

(Page 70:)

The Chairman: * * * The regular order for half past three is the report of the Committee on Uniformity of Railway Accounts, and its consideration is now in order.

The report seems to be in two parts—one in regard to taxation, and the other relates to distribution of accounts. They may be considered as a whole or separately, as the Convention may order."

From the Report of the Committee on Uniformity of Railway Accounts:

Mr. Hill of Virginia: "I desire to ask Mr. Seymour a question. I listened as carefully as I could to the reading of the report, but do I understand that the Committee reports in favor of abandoning the division of expenses as between freight and passenger traffic, and of hereafter including both under the head of operating expenses.

Mr. Seymour: The committee reported in favor of abandoning the apportionment of expenses between freight and passenger traffic.

Mr. Fleming: Mr. Chairman, if I may be permitted, I would like to make a suggestion. It is almost impossible for us to pass upon all these reports without some definite proposition be laid before the Convention. I don't remember that the committee proposed any special resolution summing up the practical points, and therefore I suggest that it would facilitate business if they would put in short form just what practical points they desire to have acted upon.
845 The Chairman: If the Chair may be permitted to suggest, it seems to me that the question should be, first, on the adoption of the report in regard to taxation, and then on the other part, so that action may be taken separately. * * *.

(Page 97:)

The Chairman: * * * The next recommendation of the committee is, as I understand it, one upon which the committee and the account-officers are unanimous.

Mr. Seymour: The question is upon the recommendation to discontinue apportioning the expenses between freight and passenger earnings. Upon that question the accounting officers and the committee are unanimous.

Mr. Adams, the Statistician: This proposal of the committee seems to me to be by far the most important one that comes up in this report, and I rise simply to suggest that, as it involves a very important question, I doubt whether it ought to be forced through. Before the

vote is taken I would like to be allowed about two minutes. All that I wish to say is this: It is doubtless true that the opinion of the railway accounting officers throughout the country supports the proposal of the committee. It is also true that the rule of apportionment of expenses as between passenger and freight earnings as laid down at the present time does not reach the best results.

My thought is, that inasmuch as the proposal of the committee involves the abandonment of all attempt to arrive at the cost per ton per mile and the cost per passenger per mile, the vote upon that proposal ought not to be taken without discussion. The aim of
846 statistics is to assist commissioners in the performance of their duties. If the statistician knows what the theory of rates is which the commissions to whom is entrusted the question of determining just and reasonable rates have accepted, he can adjust his work to that rule. There is at present no clearcut and universally accepted theory for determining what is a fair and reasonable rate, but if there be any shadow of such a theory, it is that rates are in some way attached to cost. This being true, I would ask if it is wise to abandon without discussion all attempt to get at the cost per ton per mile. I admit that the present rule for arriving at this result is an imperfect one, but it is possible that better rules may be formulated. It seems to me that in this matter the Convention should defer to the wishes of the commissioners, to whom is assigned the duty of determining what is a just and a reasonable rate. If the commissioners of such States say that the assignment of expenses to passenger and to freight is of no importance, I should heartily favor the recommendation of the Committee. It is because I feared that this most important question, so far as accounting is concerned, was to pass without discussion that I ventured to make these remarks.

Mr. Dey: I belong to a commission whose duty it has been to fix rates for the transportation of freight. It has been a very serious and difficult matter, and it seems to be the aim and wish of these corporations to give us just as little light as possible on the means by which we may arrive at a solution of questions presented. It strikes me that this matter should not be disposed of without a little more thought and a little discussion than it has had.

847 Mr. Wilson: This is a very important matter and I move that we adjourn until tomorrow at ten o'clock.

The motion was agreed to, and the Convention at 5:25 p. m. adjourned accordingly.

The Chairman: The Convention will come to order. Yesterday afternoon the Convention adjourned pending the discussion as to the division of expenses between passenger and freight traffic. Is it the pleasure of the Convention to proceed with that discussion, or to take up the report of the Committee next in order of business?

* * * * * * *

Mr. Adams: I am responsible I believe for having this question postponed until this morning.

The matter is one of very great importance, and I think that

of all the questions which are presented this session to the Convention, upon which a definite vote is expected, this is probably the most important. It would not be wise to enter into any extended discussion with regard to the ability of railway accountants to separate the expenses between passenger and freight, for I think it is conceded by all who have looked into this matter with care that that division cannot be made with absolute accuracy.

Looking at the matter, then from the point of view of an accountant or statistician, I will frankly say that if the matter is to come to a vote at the present time, I prefer that the recommendaion of the committee should be accepted, and that the assignment now
848 attempted between passenger and freight expenses should be abandoned. But, as I remarked last evening, the question is not entirely a question of accounts. The purpose for which this assignment between passenger and freight expenses has been maintained is to arrive at the average cost of moving a ton of average freight, and it is generally believed that this information is of assistance in determining what are fair and reasonable rates. The question, so far from being a question of accounts, is one which should be determined by those who are imposed by law with the duty of making rates.

The question presented to this Convention, therefore, reduces itself to this: Do the commissioners upon whom is imposed the duty of determining in particular cases whether a schedule of rates is just or unjust, of the estimated cost of moving a ton of freight one mile? This assignment of expenses to passenger and to freight traffic is something that has been going on for over thirty years, and I do not think its abandonment ought to be effected unless the matter is clearly understood. If it is abandoned it should be only after the most careful consideration. We have now before us the facts in the case so far as the representatives of the railways are able to present them. We have their side of the question clearly presented, and in the investigation undertaken by the statistical department of the Interstate Commerce Commission the opinions of the prominent railway auditors in this country have been gathered together. We have not, however, the views of the State railway commissioners, who are most interested in the question.

It occurred to me, therefore, Mr. Chairman, that possibly before a final vote came upon this very important question we should ask the commissioners of those States upon whom is imposed the duty of determining what is a reasonable and a just rate whether they
849 actually make use of this average; whether they regard this approximate information as useful? And if I were a member of this Body I should make a motion to the effect that this second recommendation of the committee be laid upon the table for a year—that is, until our next convention. In the meantime that there be appointed another committee, who shall correspond with the commissioners of the States referred to, and gather facts pertaining to the use that has been made in the past of this average cost per ton per mile and the opinions of these commissioners with regard to the desirability of continuing the apportionments.

Mr. Fort: I have listened with much interest to the remarks of the gentleman who has just taken his seat, and I hope this convention will not adopt the second recommendation of the committee. Representing a commission that is required to make rates, I beg leave to state that use is made by that commission of the items now sought to be combined. They are not regarded as strictly accurate, but as approximately so. They are considered as a circumstance in rate-making, and a very important one, and if we are to abandon that system because we cannot get mathematically correct information we will be absolutely in the dark on this subject. It seems to me it would be much better to have some information that is approximately correct than to have no information at all. The question of fixing just and reasonable rates covers a wide field, and a great many elements, of course, enter into the question for its proper determination. This is one circumstance which always, by the Georgia commission at least, is considered important. It frequently arises upon the questions of change of rates, on the question of fixing a standard or schedule, and it seems to me, as Judge Cooley says, the
850 railroad problem is the rate question. While only seventeen State commissions have authority to make rates the others, I dare say, will finally be given that power.

So I trust this Convention will not adopt the suggestions of the committee. While they have been very strongly presented, the substance of the argument, as I have gathered from the able report, is because we cannot get mathematically accurate information, we had better have no information. I do not think that is good reasoning, and, speaking for one of the commissions that has the rate-making power, I beg to enter my protest against the abandonment of this source of information that is much used and of much importance.

Mr. Wheeler: I in part represent a State whose commission has the rate-making power, and we disregard in making our rates the approximate passenger and freight expenses. We pay no attention to them, but we classify our roads according to the net earnings per mile. That includes both passenger and freight, and we base the rates upon those net earnings.

And I will say further that I do not believe there is a State in the Union where there is less friction between the people and the railroads than in the State of Illinois. They are satisfied on both sides. The people seem to be satisfied with the rates, the roads seem to be satisfied with the rates; at least they accept the rates—the maximum rates—as published by the commission, and in many instances make rates lower than those authorized by the commission. We do not prescribe minimum rates. We simply fix maximum rates, and the people are satisfied with the actions of the various roads in following the rates as established by the commission or in making lower rates than the commission authorizes. I repeat that I do not be-
851 lieve there is a State in the Union where there is less friction between the people and the railroads than in the State of Illinois.

Mr. Putney: Mr. Chairman, I am somewhat out of the pale of this discussion for the reason that in preparing a form for our railroads

to make their returns upon, and trying to conform as far as practicable to that of the Interstate Commerce Commission, we have cut out the apportionment of expenses entirely, and I cannot conceive of any circumstance that would induce us to put it back. But perhaps I may say a word about the reason. In the first place, I believe this division is largely arbitrary and therefore incorrect and misleading; it is of no use unless it is accurate, and that cannot be, in the nature of things. But it is suggested that if we cannot get just what we want, let us approximate to it. Now, we have the duty of regulating rates in our State—fixing the maximum charges and regulating them generally upon complaint. I have never been able to see how this division of expenses in the freight and passenger business helped us in the least; how it could help us if it was perfectly exact. It don't amount to anything to us when trying to fix a fair coal rate from the seaboard to our interior towns to know that the average cost for hauling all freight, including coal, baby carriages, benzine, silk, and everything else, is a cent per ton per mile. It won't help us, to give the people a fair rate through the gorges and over the heavy grades in the White mountains or to give it down in the suburbs, to know that the average rate and cost of hauling passengers is so much when we include the suburban passengers, where passenger trains are heavily loaded and the roads are easily and cheaply constructed, and also the mountain business, where passengers are few and the
852 cost of construction very great. And so I cannot see how it could help us in Georgia or New Hampshire, to fix a rate on a specific article for a specific distance, to know what, if we could know, the average expense of doing all of the business of the roads is. I think the items entirely misleading. They are made up necessarily by railroad accountants in an arbitrary guess-work manner. I never was able to see any earthly use for it, and it seems to me that that is one thing to avoid in these returns; it is calling for the impossible, or the absurd, or the useless.

They used to talk down in our country about a very eminent and radical Prohibitionist, of whom they said he would be a very useful citizen if he could let rum alone under every circumstance. There are lots of that kind of men; they cannot avoid doing too much; but it is what we ought to avoid when we call upon a railroad to furnish information which cannot be given, which is of no use if it could be given; it simply cheapens the whole system of railroad reports, it seems to me.

Mr. Fort (of Georgia): Would you say that a maximum rate fixed below the cost of service, economically performed, would be a just and reasonable rate?

Mr. Putney: I don't see that it affects it in the least. We are called upon to fix a rate on coal from the seaboard to a place forty miles in the interior. Now, if somebody will explain to me how the reports, as they have been called for heretofore, aid us in the least, I would like to know, if we could know, what it costs to haul that ton of coal. But you lump everything in a grand mess, and it has no relation to anything you want to know.

853 Mr. Beckman: Mr. Chairman, I would state that we are a good deal in the same fix in our State. We have some thirty roads. For some of the roads we establish a rate for passengers of 2½ cents per mile, and for others a rate of 10 cents per mile. If we did not allow 10 cents per mile the claim would be made that the passenger business was too light for a lower rating. We make a rate for almost every road. Where there is a great deal of travel we make a less rate; but where the travel is light and amounts to only a trifle we make a high rate. On one road they keep up forty miles of snow-shed, and we have to take all such things into consideration; therefore the statistics would be of very little use to us:

* * * * * * *

Mr. Fort: I move that it lay, this portion of the report, on the table, to be taken up at our next annual meeting. Perhaps we can arrive at that time ar some more accurate form than the one now adopted for ascertaining these facts.

The Chairman: It is moved and seconded to lay on the table that portion of the committee's report relating to the apportionment of expenses——

Mr. Woodruff: May I ask further if it is designed to lay on the table the matter for another year or is there——

The Chairman: The motion, as I understand it, was to lay that portion of the committee's report on the table until another year.

854 Mr. Wheeler: It seems to me, even from the remarks of those gentlemen who are not prepared to adopt the recommendation, that there will be no future light upon the matter. If this is admitted, that it is impossible to give anything but an approximate estimate, and, as has been stated here, that it is all guesswork, there is no use of postponing action on this question. That is the way it seems to me.

* * * * * * *

The Chairman: I think perhaps the gentleman had better withdraw his motion, as the discussion does not appear to have been concluded. If there is no objection we will continue the discussion.

* * * * * * *

Mr. Dey (of Iowa): * * * Now, I don't know that the form of question presented is exactly the correct thing, but I would like to see this question postponed for a year. That time will give the railroad journals, the business men interested, the railroad officials and everybody else a chance to give it full and fair discussion, and if they can satisfy us that these statistics are worthless to the commission or the world in reaching correct data, then we are willing to take this step and consider them worthless. I for one would be very desirous of voting with them. Certain information which has been asked and which we deem necessary has been refused, and we have

had to let it pass along without having any sort of chance to learn anything; besides, they attack us in the papers and in the railroad journals and everywhere else. The returns when made are of no value to us and don't pay. I feel very anxious about this matter, because the disposition of all these long roads—not the short
855 roads like some of those in New England, but these great roads that pass from State to State, whose officers say to us, 'Here are our gross earnings, here our gross expenses, and that is all we can give you in the matter of statistics.' That disposition seems to be growing. I do not mean to charge bad faith against anyone, but the lines have been gradually narrowed down, until now the reports of some of these roads, to say the least, are not particularly valuable.

* * * * * * *

Mr. Wilson: I represent the State of North Carolina, which has the power of making rates, and they have been uniformly adopted by our roads; we also have uniformity in railroad accounting. This gives us the information desired, which is furnished to us upon the printed form of the Interstate Commerce Commission, and I, for one, would be very loath to make any change in regard to the accounting methods pursued in our State. I have heard nothing from that Commission upon the proposed change in this report, and I would like to have the matter postponed for a period of twelve months. During that time we can hear from the parties interested, the railroad journals of the country, the newspapers, and all publications interested in the work, and be in better condition to determine upon that matter at that time.

The Chairman: The question comes up on Judge Fort's motion to lay that portion of the committee's report relating to the apportionment of expenses to passenger and freight traffic on the table for one year—to be considered another year. Shall I take the vote by yeas and nays?

856 Mr. Woodruff: I assume that this vote is to prevail. I would like, however, to have the gentlemen amend it in such form that it be referred to a committee, to be reported at the next meeting. I may assume to say that my associate's modesty is equal to his wisdom, and I say this in his behalf: The committee having this matter in charge have served, some of them, for a year or so, and I would like to suggest that a new committee be appointed to take charge of the subject and to consider the matters contained in this discussion under the varying circumstances of other States. I think this would be desirable, instead of its going back to the same committee.

Mr. Freeman: Let us decide this matter one way or another, and if we make a mistake it can be corrected. When we go out from here and are asked what we have done we do not want to say that we have done nothing. Here we have had a committee that has been at work upon this question for three years, that has always been open and ready to receive communications from both sides, and

given it a very full and exhaustive consideration, and made a unanimous report; it does not seem to be a wise thing to postpone it for another year and have another committee begin and go over it again. * * * It seems to me that, inasmuch as the railroads themselves admit that they cannot properly divide these expenses, it is an unfair thing to use those figures either for or against the railroad company. I trust we will decide this matter today.

Mr. Seymour: Before that vote is taken I would like to make a brief statement in regard to the position of the committee. One member of the committee has been serving in this capacity for three years, considering this question; two members of the com-
857 mittee have served for two years. Last year we made just such a report as is contemplated by this motion—a report postponing definite action upon the subject until we could see a little more of the working of the system. We felt that it was due to the Convention which appointed us this year that we should report our conclusions upon this subject after so long and patient an investigation. I am here to urge the Convention to adopt our conclusions. If the facts presented in that report were in any way questioned or assailed the members of the committee would be heard from in defense of it, because we think we have the facts before us to substantiate our position. We have the unamimous opinion of the accounting officers that it is impossible to ascertain—even to approximate—the cost of freight and passenger traffic respectively. We have the opinion, if I may state it, of the statistician of the Interstate Commerce Commission to the same effect. We have the opinion of the chairman of the commission—the late chairman of the commission—positively to the same effect. All of the communications which came to use were to that effect; that instead of being approximately correct in many instances the rule working on certain roads would show that certain kinds of traffic was done at a loss when it was absolutely known that there was a profit. The committee could not see how such a rule was of any use to the Convention, and therefore recommended its abandonment. We are *out*, as I said before, desirous of prolonging this discussion. The committee does not wish to urge upon the Convention the adoption of its views, but we thought it just to ourselves that we should report our conclusions and leave you to act upon the subject.

* * * * * * *

858 The Chairman: The motion is to lay on the table that portion of the committee's report relating to apportionment of expenses between passenger and freight traffic.

The yeas and nays were called for and the Secretary called the roll. The result was announced—yeas, 18; nays, 18. So the motion, the chairman having voted, was lost.

Mr. Walsh: Mr. Chairman, I move the adoption of the report.

Mr. Fort: I move as a substitute to recommit, with instructions to the committee to report at the next Convention.

* * * * * * *

I ask a vote on the motion that the report be recommitted to a committee of seven, to be appointed by the Chairman, to report to the next annual Convention.

The yeas and nays were ordered and the Secretary called the roll. The result was announced—ayes, 21; noes, 14. So the motion was agreed to."

From the Report of the Committee on Uniformity of Railway Accounts, Proceedings of Fifth Annual Convention of Railroad Commissioners, 1893:

(Page 41:)

"Your committee, to whom was referred that part of the report of the Convention on Uniformity of Railway Accounts to the Convention of 1892, recommending that the assignment of expenses to freight and passenger traffic be discontinued, and also the transfer of certain items, etc., beg leave to report as follows:

859 First. We recommend the adoption of that part of the report of the committee made to the Convention of 1892, providing for the discontinuance of the assignment of expenses to freight and passenger traffic. This to take effect July 1, 1893.

* * * * * * *

With the submission of this report your committee respectfully asks to be discharged.

A. K. TEISBERG, *Minnesota;*
J. H. PADDOCK, *Illinois;*
THOMAS THOMPSON, *Wisconsin;*
WILLIAM BECKMAN, *of California,*
Committee on Uniformity of Railway Accounts.

(Mr. Beckman filed a letter agreeing to first part of report only.)

The Chairman: Gentlemen; you have heard the report; it is open for discussion and consideration.

Mr. Brown, of Pennsylvania: I move that the report be adopted.

* * * * * * *

Mr. Clifford: I will state to the Convention that some of us were absent at the time the motion was made by Mr. Brown that this report be adopted. I suppose the effect of the adoption of this report will be to change our present form to correspond to the suggestions of this report.

* * * * * * *

Mr. Riebenack: The changes which will result from the adoption of this report will introduce some new accounts in the classification of expenses. The subject has been gone over very carefully

860 by the committee. The members of the Association of Railway Accounting Officers, as well as the accounting officers of

railroads not presented in the Association, received copies of the proposed changes and were invited to make recommendations and suggestions. The committee were thoroughly convinced of the reasonableness and propriety of introducing the changes that were suggested. The Association of Accounting Officers had the matter before them, in a report of their executive committee, in which they advised the Association fully on the suggestions they had made to the Committee of the Railroad Commissioners, and their recommendations were unanimously approved by the Association. The general opinion was that the classification, with the changes, would harmonize better with present accounting methods than the old one.

In answer to Mr. Hillyer's question, I would say that the adoption of this report will involve some changes, and it was so understood by the committee making the report, and by the Association of American Railway Accounting Officers.

The Chairman: Gentlemen, is there anything further that you have in mind in relation to this question; if so, we would be glad to hear it.

Mr. Brown, of Pennsylvania: I would state that this is the second time that committees have been appointed on this subject. You remember they reported two years ago, and those who have the Proceedings of the Convention held then will find the arguments that were made in favor of the adoption of this report. The Convention, however, at that time, did not seem ready to act upon it,
and referred the matter to another committee appointed by
861 the Convention held one year ago, and that Committee have
again reported in favor of making the changes suggested.

The Chairman: Anything further, gentlemen? If not, the question is upon the adoption of the Committee's report.

The report was unanimously adopted."

From the Report of the Standing Committee on Corporate Fiscal and General Accounts, Twenty-eighth Report of the Association of American Railway Accounting Officers, 1913:

(Page 22:)

"The report of the Standing Committee on Corporate Fiscal and General Accounts was received, considered section by section, the following action taken thereon, and adopted as a whole.

Section First.

Relative to Statistics—General. Received.

Relative to Statistics—Division of operating expenses between passenger service and freight service. The following resolutions of the Committee were approved.

Resolved, That this Committee concurs in the view expressed by the Special Committee on Corporate Fiscal and General Accounts in the year 1906, and that this Committee, after due and deliberate con-

sideration, reiterates that no fixed rule for the division of common expenses between freight and passenger can be devised which will be equitable to all carriers, to the same carrier under all conditions or to all divisions of the same carrier; and be it further

Resolved, That the attention of the Commission be called to the fact that even the partial separation suggested by the Commission of stating the amount of expense directly assignable to freight or passenger will involve some additional expense to the carriers, with no appreciable benefit to the Commission.

* * * * * * *

862 Since that time the sub-committee, as well as the full Committee, has diligently pursued the matter in co-operation with representatives of the Commission. The subjects thus far presented to your Committee in respect to the general question are:

(1) The determination of those operating expenses which may be directly allocated to:
   (*a*) Freight Service.
   (*b*) Passenger Service.
   (*c*) Service common to both freight and passenger service; or, in other words, those expenses which cannot be accurately assigned to either Freight or Passenger Service.
   (*d*) Consideration of fixed formulæ or rules for allocating common expenses to Freight Service and to Passenger Service.
(2) Traffic Statistics.
(3) Modification of the form of annual report to the Interstate Commerce Commission, which carries with it consideration of the various statistical tables therein required.

Your Committee submits the following report upon each of these subjects:

Subject: Statistics—Division of Operating Expenses between Passenger Service and Freight Service.

In reference to the question of the allocation of operating expenses to passenger service and to freight service, your Committee presents the following:

Whereas, Commissioner B. H. Meyer, in his letter to the Presidents of sundry railroads, in referring to division of operating expenses between passenger and freight used the following language:

"I am advised that the question of separating expenses among the different branches of the business has been raised. This idea is as old as the railroads. I believe such a separation should be undertaken as far as it can be correctly done without unnecessarily suggesting misleading conclusions. I have long felt that every useful scheme of operating statistics rests upon such a separation. I regard this separation as fundamental, and unless hitherto un-

thought of objections can be raised, I assume that all the carriers will cooperate in doing it in the future, as some of them have done it for many years past. A beginning could be made by reporting all expenses which are assignable to passenger, freight and other branches of the business under existing classifications.

863

All those expenses which cannot be directly assigned, should be reported unassigned, unless the carriers voluntarily desire to submit a complete apportionment. Such apportionments have been made very elaborately for important systems and the Commission would certainly wish to get the benefit of this work; but I should be opposed, for the present at least, to any plan looking toward the assignment or apportionment of all expenses of every class to the respective branches of the business in reports to be made to the Commission. If the Commission is in possession of the figures representing expenses which are actually assignable, it can, if necessary, go beyond this, stating for the information of all concerned, the bases more or less arbitrarily adopted for common items, and the reason for their adoption in every individual case. I should be inclined to recommend the adoption of a report *from* which will leave it optional with the different carriers to report separately only the assignable expenses, leaving common expenses unapportioned, or to report a complete apportionment. In case the latter alternative is selected, however, each carrier should be required to state the basis upon which it made its apportionments and the reason for adopting that particular basis."

And Whereas, In his remarks before a Subcommittee of this Committee at Washington, D. C., February 8, 1912, he reiterated that opinion, using the following language:

"One of my suggestions was that, putting aside all controversy with respect to the separation of expenses between the different branches of the business, carriers might report all expenses assignable to passenger, freight and other branches of service under existing classifications. As I see it from the point of view of the Commission, I feel that this is fundamental. * * *.

It is axiomatic with you that before we can have anything in the way of cost, we must have a separation of expenses. Then, of course, you come into the complicated question of mixed expenses and expenses that cannot be allocated. What would help the Commission is the expenses that can be allocated and then enter into those that cannot be allocated. It would help if some companies would report all expenses which are actually assignable, designating other expenses as unassignable, unless they desire to submit a complete apportionment, stating the basis used. If 20 roads make such returns, it is quite possible that in those 20 there will be suggestions enough to lead to uniformity for 50 next year. So in working along these matters will develop. If we would put ourselves to the problem like the people in the manufacturing business have put themselves to the problem, I am inclined to believe we could make headway. I realize those differences that exist, and yet the fact remains that they too have these arbitrary apportionments to deal with. * * * I did not mean to convey the im-

pression that I had in mind to apportion 100% of the ex-
864 penses between different classes. In my written communications I intimated that I would oppose it. * * * As for the apportionment of expenses between freight and passenger; they might be divided as far as possible and then the common expenses put in a pot, so to speak. * * * I should hope that the matter of division between passenger and freight should not cause you to pause too long in the elaboration of our operating statistics. In the separation between passenger and freight, here are certain things that have been definitely apportioned to passenger, say 40 per cent., and that leaves 60 per cent. unapportioned. No one can use that. The present proposition is to separate the 40 per cent. and then leave 60 per cent. to any one interested in making the additional separation."

And whereas, The question of formulating rules for the division of operating expenses between freight and passenger was discussed by the Special Committee on Corporate Fiscal and General Accounts prior to the promulgation of the present classification of Operating Expenses, at which time, after full consideration, it was decided that no fixed rules could be made which would apply alike to all railroads under the varying conditions.

And whereas, This Committee has formulated the following (mentioned) text indicating the items of operating expenses under the existing classifications, which are directly assignable to freight or to passenger, and the question of apportioning expenses common to both classes of service has now been brought before this Committee.

And whereas, While in practical experience some carriers have made division of expenses between freight and passenger, this has been true only in specific cases and subject to the individual judgment of the party making the division. Therefore, be it

Resolved, That this Committee concurs in the view expressed by the Special Committee on Corporate, Fiscal and General Accounts in the year 1907, and that this Committee, after due and deliberate consideration, reiterates that no fixed rule for the division of common expenses between freight and passenger can be devised which will be equitable to all carriers, to the same carrier under all conditions or to all divisions of the same carrier, and be it further

Adopted.

Resolved, That the attention of the Commission be called to the fact that even the partial separation suggested by the Commission of stating the amount of expenses directly assignable to freight or passenger will involve some additional expense to the carriers, with no appreciable benefit to the Commission.

Adopted.

Your Committee, after full consideration, having in mind the facts and conclusions above expressed, formulated a tentative text of those items which directly and in the ordinary course of business

allocate themselves to one of the three classes of service, i. e.,
865 Freight, Passenger *of* Common. Such text was reported in Bulletin No. 59 of November 25, 1912, a copy of which is, with this report, submitted to each member of the Association. It should be borne in mind that the text referred to was produced from the Classification of Operating Expenses now in existence and may not fit or meet the requirements of the tentative Classification of Operating Expenses now under consideration.

Your Committee wishes to call your especial attention to its findings in respect to item (*d*); that is, the determination of a fixed rule or formula for allotting common expenses to either Freight or Passenger Service.

Your Committe desires also to advise you that it has had brought to its attention the possibility of the Commission requiring carriers to report their operating expenses in the three classes named, i. e., Freight, Passenger and Common, instead of as totals, as heretofore.

It is of great importance that these matters be given careful and thorough consideration by the Association, to the end that the Interstate Commerce Commission may be given the benefit of the best judgment of the Association upon them.

* * * * * * *

Report of Special Committee to Attend Convention of National Association of Railway Commissioners.

As Received.

Chicago, March 19, 1913.

Mr. M. P. Blauvelt, President of Association of American Railway Accounting Officers, Chicago, Ill.

DEAR SIR: Since the last meeting of our Association, this Committee has attended the 24th annual convention of the National
866 Association of Railway Commissioners, held in Washington, D. C., on November 19, 20, 21 and 22, 1912.

The report to that Convention by its Committee on Statistics and Accounts, of which your chairman is a member, dealt with

Assignment of Revenue and Expenses by State Lines.
Study of Terminal Operations.
Analysis of Operating Expenses.
Revision of Annual Report Forms.
Standard Classification of Accounts.
Annual Report Forms for Express Companies.
Wage Statistics.
Efficiency.
Quality of Service, and
Traffic Statistics.

The Railway Commissioners' Committee, in its report, expresses some discouragement in the matter of the 'Assignment of Revenues and Expenses by State Lines,' but was of the opinion that a solution

might be found by giving up the attempt to adopt a straight mileage pro-rate of earnings and substituting therefor a plan allowing something for the terminals, and after deducting that allowance from the revenue, apportioning the remainder on a mileage pro-rate. It will be difficult to find a proper basis for terminal deductions, and one which will be acceptable to the different states.

The study of 'Terminal Operations' was undertaken partly with the idea of its assistance in apportioning revenue to states, and partly for the purpose of determining what is the cost of operating at the different termini.

The 'Analysis of Operating Expenses' appears to have for its object the determination of the cost of different classes of service. Your committee is in sympathy with the idea of service costs where obtained for the purpose of comparing efficiency of operating department representatives under exactly similar circumstances and
867 conditions, but believes that the attempt to determine costs for the purpose of measuring reasonableness of rates will eventually be abandoned.

In attempting to make a 'Revision of Annual Report Forms' there is danger that the Commission will call for information entailing great expense on the railroads. The intention seems to be to obtain figures which will measure the efficiency, quality of service, and the intricacies of the traffic movements on the various roads of the country. Your committee is of the opinion that such figures will not answer the purpose of the Commission, and that if the railroads are obliged to compile the information, year in and year out for the Annual Reports, the expense will prove to be very burdensome and not justifiable.

Respectfully submitted,

L. A. ROBINSON.
J. A. TAYLOR.
C. I. STURGIS, *Chairman.*"

Q. Mr. Parker, will you produce the fifth annual report of the statistics of the Interstate Commerce Commission, entitled "Statistics on Railways in the United States, 1892." Will you read into the record from that report what is set forth on pages 86 and 87 with reference to the division of operating expenses between freight and passenger?

Mr. Eldredge: Objected to as irrelevant and immaterial, having no bearing on any subject at issue in this case, and as patent also, not the best method of proof.

The Master: What do you claim that this proves?

Mr. Wykes: This is the action that the Interstate Commerce Commission took subsequent to this action of the Railway Commissioners. This has been testified to by Mr. Delf and by Prof. Adams, but nowhere has the exact language with regard to it that appeared
868 in the report been put into the case; that is, Mr. Butler called for it from Mr. Delf; he thought it was material; and I called for it from Prof. Adams because I thought it was material, and if we

both think it is material I think we ought to get the printed history on it.

A. Commencing on page 86, second paragraph:

"Two important changes in the original form have been adopted since 1888. The first of these pertains to the method of making an exhibit of the financial condition of railways. It was at first attempted to secure from the carriers a statement upon a cash basis of all receipts and expenditures during the year. Receipts of the year were classed as 'Resources' and expenditures as 'appropriations of resources.' It was found impossible to secure from the carriers a satisfactory statement of this nature. The accounting officers as a rule keep no record of payments and receipts and such a statement if it could be made, was likely to misrepresent the financial condition of the corporation at any particular time. It was recognized that sound methods of accounting ought to show the credits and liabilities of a corporation at the exact moment when a report is called for, and this can only be done by a statement of accruals of assets on the one hand and of liabilities on the other. This modification was in line with the methods of accounting of the best managed railways.

The second change was the abandonment of the attempt to assign operating expenses to passenger and to freight traffic, respectively. This assignment was introduced by the railways many years ago, when the difference in the character of the two services was so marked as to permit it to be made with a fair degree of accuracy.

With the development of railway economy, however, which
869 has resulted in increasing the rapidity of freight trains and the weight of passenger trains, it has been found that not more than half of the items of operating expenses can by any means be assigned to passenger and to freight service. This fact, taken in connection with the fact that the average cost per ton per mile and per passenger per mile, which was obtained upon the basis of the computation in question, was rarely used by Commissioners in judging of fair rates, induced the Railway Commissioners to abandon this classification. The cost per ton per mile and per passenger per mile will be published for the last time in the report for the year ending June 30, 1893."

Q. Will you produce the report of the Association of Railway Accounting Officers of the United States for the year 1913, being the 28th report.

Mr. Eldredge: Object to it, or to the introduction of any part of it, for the reason that it does not prove itself, or that it is published by any authority that makes it competent evidence.

Mr. Wykes: I ask to have the book marked as an exhibt. (Book referred to marked Defts.' Ex. 97,—should be 69,—Parker, June 2, 1914.

Mr. Eldredge: I object to it further for the reason that it is irrelevant and immaterial.

The Master: What is the evidence of the authenticity of that that you produce?

Mr. Wykes: I don't know as there is any evidence other than the fact that it is the printed copy of the reports of the Association of Accountants found in all of the railroad offices, procured by us from a railroad accountant and given to us as being the authentic printed copy of the proceedings. I don't know of any copy more authentic.

The Master: Your objections extended to that point as I understand it, that this was not an authenticated document?

870 Mr. Eldredge: Yes, sir. It does not prove itself in any way, has *not* certificate of any kind that under any rule of evidence permits it.

Q. Where did you get the book?

A. That book was given to me by an accounting officer of one of the largest railroads entering into the city of Detroit.

Q. What did you ask him for?

A. I asked for the last report of the American Association of Railway Accounting Officers. I might state that I endeavored to get it from Mr. Phillips direct, the Secretary of the American Association, but unfortunately they had sent out their entire supply. I have seen the same volume in libraries in Chicago.

Q. You have seen the same volume in what libraries?

A. In John Grearrar library in Chicago.

Mr. Wykes: I desire to offer in evidence the part of this report found between pages 97 and 105, which refers to the division of expenses between passenger and freight, and which is as follows:

Mr. Eldredge: I object to the reception of any part of the contents of the volume for the same reason that I objected to the volume, and for the further reason that the views of Commissioner Meyer expressed in a letter are not admissible in evidence. If the facts he testifies to are material, he should be produced, so as to be subject to cross examination.

From the Report of the Standing Committee on Corporate, Fiscal and General Accounts to the Twenty-Fifth (1913) Annual Meeting of the Association of American Railway Accounting Officers, as adopted.

"Your Committee has held three meetings during the current year, as follows:

871 French Lick, Ind., November 13 and 14, 1912.
Washington, D. C., January 9 and 10, 1913.
Atlantic City, N. J., April 1, 2 and 3, 1913,

and begs to report the following results and conclusions reached by it, which are respectfully submitted for your consideration.

First.

Subject: Statistics—General.

This general subject, dealt with but briefly in the 1912 report, is, in the opinion of your Committee, of such importance as to war-

rant a full explanation of its history at this time, to the end that the Association may be made fully acquainted with the Committee's work in respect to it, as well as its present status.

During the autumn of 1911, the Interstate Commerce Commission, through Commissioner Meyer, addressed letters to chief executive officers of various railways similar to the following:

'The Interstate Commerce Commission has under contemplation a revision of the blank forms whereon it receives the monthly and annual reports of steam railway carriers, and in connection therewith a careful consideration of the matter of railway operating statistics seems advisable. The Commission recognizes that in this work the expert knowledge and advice of railway officers would, if accorded, be of great assistance.

'The purpose of this note is to express the Commission's appreciation of the valuable aid which has been heretofore rendered in many ways by representatives of the railways, and particularly in the matter of developing the Uniform System of Accounts now nearing completion so far as relates to Steam Railways, and also to advise that if similar aid could be given to the Commission in the revision of its annual and monthly report forms and in the development of an adequate scheme of operating statistics, such aid would not only be highly appreciated by the Commission, but it would make possible a more perfect piece of work than could be otherwise achieved.

'The Commission believes that the best results can be reached by making a thorough study of the subject in all of its phases by the Commission's representatives and the representatives of the Railways in co-operation, bearing in mind all matters of importance that may be in any way affected by publicity of reports and the various uses to which operating statistics may reasonably be put.

872 'A few phases of the general plan of the Commission are fairly well defined and the status of its official work in this respect is such that prompt action is deemed advisable. For the most part, however, the Commission has determined upon no fixed line of action nor plan of procedure with respect to either the report forms, or the development of operating statistics.

'A letter identical with this is sent to the President of every other railway represented upon the Committee on Corporate, Fiscal and General Accounts of the Association of American Railway Accounting Officers.'

Apparently the replies received by the Commissioner to such letters made inquiry as to the details desired and the scope of the work to be undertaken. This assumption is based upon a subsequent round letter issued by Commissioner Meyer in December, 1911, a copy of which follows:

Interstate Commerce Commission,

Washington.

December 2, 1911.

DEAR SIR: Partly in acknowledgment of the last letter received from executives of railways represented on the Committee on Corpo-

rate, Fiscal and General Accounts, and partly as a supplementary answer to earlier replies, I am addressing this communication to the presidents of all the railways represented on that Committee.

At the outset I am pleased to be able to report that the replies to all the communications from this office show a gratifying spirit of cooperation with proposed work.

In one form or another, quite a few of them express the desire of receiving from the Commission more specific suggestions with respect to the lines of inquiry to be pursued. This request is a very fair and reasonable one, and I therefore beg to be permitted to submit
873 certain suggestions. It must be borne in mind, however, that these suggestions come from me personally and individually, and not from the Commission as a whole, although I have every reason to believe that my colleagues will endorse the general plan herein outlined whenever the same may be presented in its elaborated form for official approval.

All the different lines of inquiry suggested heretofore, and every line of investigation which may be suggested herein, constitute, after all, only a single large problem, namely, the problem of analyzing operating expenses and of reporting the results of the statistical compilations showing this analysis, in the most practicable and useful manner.

Attention has frequently been directed to the relative futility of requiring small local roads, that are technically interstate in character, to make annual and other reports which are in every respect identical with those required of the largest systems. It seems to me worth while to deliberate, at least briefly, upon the expediency of classifying interstate carriers into two or three different classes, and requiring simpler and briefer reports from the less important ones.

The Committee on Statistics of the National Association of Railway Commissioners was instructed to inquire, among other things, into the possibility of adopting a report form which will meet the requirements of the Interstate Commerce Commission, as well as the substantial requirements of the State Commissions. In other words, the aim is to unify all reports to such an extent that interstate carriers will compile only one report and send copies of this report to the Interstate Commerce Commission and to the State Commissions of the respective states in which they operate. The advan-
874 tages of a single report, if one can be devised, and adopted, are obvious, and it certainly is worth while to inquire carefully into this proposal.

A number of the replies received express the view that the present annual reports and the compilations based thereon, embrace items, columns or tables which have relatively little value compared with the time and expense required in their preparation. I believe that both the annual report form and the annual publication entitled 'Statistics of Railways in the United Stattes' should be very thoroughly examined with a view of eliminating all items, columns and tables which cannot be justified from the point of view of utility, effort and expense.

In the matter of operating statictics consideration should be given

to the necessity and feasibility of adopting certain new statistical units and of standardizing existing ones. Should such items as gross tonnage, locomotive service hours, etc., be compiled? Careful inquiry should be made to ascertain to what extent statistical units already adopted, or to be adopted, do not stand for the same thing in regard to different carriers. This suggestion is not made in the hope of securing compilations of statistics which are necessarily comparable at their face value for all the railways in the United States. It is to be presumed that all statistics must be interpreted in the light of the conditions under which the carrier to which they apply conducts its business. It should, however, be possible to secure figures which are comparable within these limitations.

Questions will doubtless be asked regarding the use to which these statistics shall be put. My answer is to whatever purpose
875 they can fairly and honestly be applied by any one whatsoever, whether Court, Commission, Railway Company, Bank Investor or private citizen.

Much has been said regarding 'Efficiency Accounting.' It is immaterial to me whether we use the term 'Efficiency Accounting,' 'Economy Accounting,' or 'Cost Accounting,' or any other proper descriptive term. They all come to the same thing, namely, a detailed analysis of operating expenses with a view of reflecting the actual results of operation and generally the creation of a statistical consciousness for every important operating property. From the point of view of a large class of controversies constantly being submitted to the Commission for adjudication, it is extremely desirable, almost vital, to have for consideration statistical information throwing light upon the cost of operation, both absolute and relative.

From the point of view of the railway companies as private organizations, it seems to me that carefully compiled statistical data will have value in many diverse directions. What operating official will not study with profit comparative statistics relating to fuel consumption, cost of labor, repair of equipment and many other similar items? I do not believe that any one can foretell or foresee the manifold ways in which statistical information of the character I have in mind can be applied with profit to all the parties who are interested in the conduct of the business. It is quite probable that many uses will be discovered as the work proceeds and as the results of this work accumulate year by year.

876 I am advised that the question of separating expenses among the different branches of the business has been raised. This idea is as old as the railways. I believe such a separation should be undertaken as far as it can be correctly done without unnecessarily suggesting misleading conclusions. I have long felt that every useful scheme of operating statistics rests upon such a separation. I regard this separation as fundamental, and unless hitherto unthought of objections can be raised, I assume that all carriers will co-operate in doing it in the future, as some of them have done it for many years past. A beginning could be made by reporting all expenses which are assignable to passenger, freight and other branches of the business under existing classifications. All those expenses

which cannot be directly assigned, should be reported unassigned unless the carriers voluntarily desire to submit a complete apportionment. Such apportionments have been made very elaborately for important systems and the Commission would certainly wish to get the benefit of this work; but I should be opposed, for the present at least, to any plan looking toward the assignment or apportionment of all expenses of every class to the respective branches of the business in reports to be made to this Commission. If the Commission is in possession of the figures representing expenses which are actually assignable, it can, if necessary, go beyond this, stating for the information of all concerned, the bases more or less arbitrarily adopted for common items and the reason for their adoption in every individual case. I should be inclined to recommend the adoption of a report form which will leave it optional with the different carriers to report separately only the assignable expenses, leaving
877 common expenses unapportioned, or to report a complete apportionment. In case the latter alternative is elected, however, each carrier should be required to state the basis upon which it made its apportionments and the reason for adopting that particular basis.

These are only general suggestions which may be regarded as talking points. I shall endeavor to follow the details of the deliberations of the Committee which is to undertake this work and to attend its sessions as frequently as possible. The Commission will be represented at all of these meetings by its Statistician and its Associate Statistician.

Very respectfully,

(Signed) B. H. MEYER,
Commissioner.

It would also appear that a majority, if not quite all, of the Chief Executives addressed delegated their Accounting Officer to pursue this work with the Commission, its representatives or with both; and acting upon such instructions, your Committee, at a meeting held in Louisville, Ky., January 8, 9 and 10, 1912, passed the following resolution:

Resolved, That a subcommittee of eight, of which the Chairman of this Committee shall be chairman, be appointed by such chairman, to confer with the Interstate Commerce Commission or its representatives, or both, on the subject of Statistics; such subcommittee to report to this Committee.

Since that time the sub-commitee, as well as the full committee, has diligently pursued the matter in co-operation with representatives of the Commission. The subjects thus far presented to your Committee in respect to the general question are:

(1) The determination of those operating expenses which may be directly allocated to:
   (*a*) Freight Service.
   (*b*) Passenger Service.

878 (*c*) Service common to both freight and passenger service; or, in other words, those expenses which cannot be accurately assigned to either Freight or Passenger Service.

(*d*) Consideration of fixed formulæ or rules for allocating common expenses to Freight Service and to Passenger Service.

(2) Traffic Statistics.

(3) Modification of the form of annual report to the Interstate Commerce Commission, which carries with it consideration of the various statistical tables therein required.

Your Committee submits the following report upon each of these subjects:

Subject: Statistics—Division of Operating Expenses Between Passenger Service and Freight Service.

In reference to the question of the allocation of operating expenses to passenger service and to freight service, your Committee presents the following:

Whereas, Commissioner B. H. Meyer, in his letters to the presidents of sundry railroads, in referring to division of operating expenses between passenger and freight, used the following language:

'I am advised that the question of separating expenses among the different branches of the business has been raised. This idea is as old as the railways. I believe such a separation should be undertaken as far as it can be correctly done without necessarily suggesting misleading conclusions. I have long felt that every useful scheme of operating statistics rests upon such a separation. I regard this separation as fundamental, and unless hitherto unthought of objections can be raised, I assume that all the carriers will co-operate in doing it in the future, as some of them have done it for many years past. A beginning could be made by reporting all expenses which are assignable to passenger, freight and other branches of the business under existing classifications. All these expenses which cannot be directly assigned, should be reported unassigned, unless the carriers voluntarily desire to submit a complete apportionment. Such apportionments have been made very elaborately for important systems, and the Commission would certainly wish to get the benefit of this
879 work; but I should be opposed, for the present at least, to any plan looking toward the assignment or apportionment of all expenses of every class to the respective branches of the business in reports to be made to this Commission. If the Commission is in possession of the figures representing expenses which are actually assignable, it can, if necessary, go beyond this, stating for the information of all concerned, the bases more or less arbitrarily adopted for common items and the reason for their adoption in every individual case. I should be inclined to recommend the adoption of a report form which will leave it optional with the different carriers to report separately only the assignable expenses, leaving common expenses un-

apportioned, or to report a complete apportionment. In case the latter alternative is elected, however, each carrier should be required to state the basis upon which it made its apportionments and the reason for adopting that particular basis.'

And whereas, in his remarks before a subcommittee of this Committee at Washington, D. C., February 8, 1912, he reiterated that opinion, using the following language:

'One of my suggestions was that, putting aside all controversy with respect to the separation of expenses between the different branches of the business, carriers might report all expenses assignable to passenger, freight and other branches of service under existing classifications. As I see it from the point of view of the Commission, I feel that this is fundamental. * * * It is axiomatic with you that before we can have anything in the way of cost, we must have a separation of expenses. Then, of course, you come into the complicated question of mixed expenses and expenses that cannot be allocated. What would help the Commission is the expenses that can be allocated and then enter into those that cannot be allocated. It would help if some companies would report all expenses which are actually assignable, designating other expenses as unassignable, unless they desire to submit a complete apportionment, stating the basis used. If twenty roads make such returns, it is quite possible that in those twenty there will be suggestions enough to lead to uniformity for fifty next year. So in working along these matters will develop. If we would put ourselves to the problem like the people in the manufacturing business have put themselves to the problem, I am inclined to believe we could make headway. I realize those differences that exist, and yet the fact remains that they too have these arbitrary apportionments to deal with. * * * I did not mean to convey the impression that I had in mind to apportion 100% of the expenses between different classes. In my written communication I intimated that I would oppose it. * * * As for the apportionment of expenses between freight and passenger; they might be divided as far as possible and then the common expenses put in a pot, so to speak.

* * * I should hope that the matter of division between
880 passenger and freight should not cause you to pause too long in the elaboration of our operating statistics. In the separation between passenger and freight, here are certain things that have been definitely apportioned to passenger, say 40 per cent, and that leaves 60 per cent unapportioned. No one can use that. The present proposition is to separate the 40 per cent and then leave the 60 per cent to any one interested in making the additional separation.'

And Whereas, The question of formulating rules for the division of operating expenses between freight and passenger was discussed by the Special Committee on Corporate, Fiscal and General Accounts prior to the promulgation of the present classification of operating expenses, at which time, after full consideration, it was decided that no fixed rules could be made which would apply alike to all railroads under the many varying conditions.

And Whereas, This Committee has formulated the following (men-

tioned) text indicating the items of operating expenses, under the existing classification, which are directly assignable to freight or passenger, and the question of apportioning expenses common to both classes of service has now been brought before this Committee.

And Whereas, While in practical experience some carriers have made division of expenses between freight and passenger, this has been true only in specific cases and subject to the individual judgment of the party making the division. Therefore, be it,

Resolved, That this Committee concurs in the view expressed by the Special Committee of Corporate, Fiscal and General Accounts in the year 1906, and that this Committee, after due and deliberate consideration, reiterates that no fixed rule for the division of common expenses between freight and passenger can be devised which will be equitable to all carriers, to the same carrier under all conditions or to all divisions of the same carrier, and be it further,

Adopted.

Resolved, That the attention of the Commission be called to the fact that even the partial separation suggested by the Commission of stating the amount of expense directly assignable to freight or passenger will involve some additional expense to the carriers, with no appreciable benefit to the Commission.

Adopted.

Your Committee, after full consideration, having in mind the facts and conclusions above expressed, formulated a tentative text of those items which directly and in the ordinary course of business allocate themselves to one of the three classes of service, i. e., Freight, Passenger or Common. Such text was reported in Bulletin
881 No. 59 of November 25, 1912, a copy of which is, with this report, submitted to each member of the Association. It should be borne in mind that the text referred to was produced from the classification of Operating Expenses now in existence and may not fit or meet the requirements of the tentative classification of Operating Expenses now under consideration.

Your Committee wishes to call your especial attention to its findings in respect to item (*d*); that is, the determination of a fixed rule or formula for allotting common expenses to either Freight or Passenger Service.

Your Committee desires also to advise you that it has had brought to its attention the possibility of the Commission requiring carriers to report their operating expenses in the three classes named, i. e., Freight, Passenger and Common, instead of as totals, as heretofore.

It is of great importance that these matters be given careful and thorough consideration by the Association, to the end that the Interstate Commerce Commission may be given the benefit of the best judgment of the Association upon them."

Mr. Wykes: I also wish to offer in evidence, and do so, the parts of the report found between pages 59 and 72, an address given by Mr. R. A. White, Auditor of the New York Central.

Mr. Eldredge: That is objected to for the same reason that I objected to the volume or any part of its contents, and for the further reason that it gives Mr. White's views without opportunity of cross examination.

Q. Will you produce the printed copy of the affidavits filed in this case on the motion for temporary injunction, and the affidavit contained therein between pages 4 and 10 made by Mr. Delf on July 24, 1911?

882 A. Yes, I have that.

Mr. Wykes: I wish to introduce that affidavit in evidence.

Mr. Eldredge: I object to it upon the ground that the single affidavit is not admissible in evidence unless all the affidavits covering the same subject are also introduced. I suggest, Mr. Wykes, that this affidavit be not written into the testimony, but, if it shall be found to be material, it may be referred to by either party from the original affidavit, forming a part of the files in the case. The printed copy may be used subject to correction by the original.

Q. Will you produce the record of certain methods for the division of expenses between passenger and freight prepared by J. P. Muller in the case of Boilleau against the Pittsburgh & Lake Erie Railroad Co.? All I want it for is for the purpose of showing the methods for the division of common expenses applied in other cases—just for the purpose of showing the diversity of methods and the details of methods in other cases. That will be marked Ex. 98 (should be 70.) That is the Muller that has already been referred to in the testimony.

Mr. Eldredge: Mr. Wykes, I understand that this volume which you have marked Defts.' Ex. 98 (should be 70) contains certain exhibits prepared by J. P. Muller purporting to show the methods adopted by different accountants for the allocations of operating expenses to passenger and freight service respectively in certain railway rate cases, and that you propose to introduce in evidence the matter contained on pages 11 to 122 of this Ex. 98 (70)?

Mr. Wykes: That is correct, for the purpose of indicating the methods applied in the division of operating expenses only.

883 Mr. Eldredge: We will not object to the method of proof; in other words, we won't object that this volume does not prove itself, but we do object to the introduction of the pages named for the reason that they are irrelevant and immaterial, and for the further reason that they would only be admissible in evidence if J. P. Muller were produced and an opportunity given to cross examine him.

Q. Will you produce the first annual report on the statistics of railways of the United States for the year ending June 30, 1888?

A. I produce a copy of that report, and I read in evidence from pages 17 to 19 inclusive the following:

Mr. Eldredge: I object to it as irrelevant and immaterial.

"As the previous table considered all forms of ordinary income, so this table includes all expenditures except such as are incurred for permanent improvements or betterments in the financial condition of the property. Expenditures are brought under the two heads of operating expenses and fixed charges.

To operating expenses are charged maintenance of way and structures, maintenance of equipment, conducting transportation, and general expenses; and in each case the amounts so charged are assigned to freight and to passenger service. Under fixed charges are included interest on bonds, rentals, and taxes. The table closes with estimates of expenditures for one passenger or one ton of freight carried one mile, and for the cost of running a passenger or a freight train one mile.

There are two questions of importance suggested by the analysis of expenses portrayed in Table IV. The first question has reference to the classification of expenses under the four heads stated above; the second pertains to the apportionment of expenses to passenger and freight service.

884 With regard to the first of these questions, as stated in the Commission's report, on page 67, 'the distribution into four general classes was determined upon as the most scientific and satisfactory of the various systems in use, while the subordinate heads under each class are so arranged as to require no important change from what is known as the Saratoga classification of operating expenses, which was agreed upon by a convention of State Commissioners at Saratoga, June 10, 1879, and which has been quite generally adopted in actual use.' And certainly where one looks into this classification it appears simple, adequate and workable; and it is a pleasure to add that many roads that have not previously done so are now adjusting their accounts to its requirements.

The question which arises in connection with apportionment of expenses between passenger and freight service is one that cannot be determined with such confidence. One point only respecting it lies beyond the limit of reasonable controversy, and that is that such apportionment must in some manner be made.

Not only is this demanded in the interest of comparative statistics, but it is of great importance for an intelligent judgment on relative freight and passenger charges. But when the proper rule for making the apportionment of expenses comes to be considered, it is necessary, in the presence of the many and conflicting theories entertained by competent railway accountants, to proceed with great caution.

The rule adopted by the Commission, as contained in its book of instructions for the guidance of carriers in making their annual reports, is as follows:

All expenses which are naturally chargeable to either freight or passenger traffic should be entered in their respective columns; expenses which are not naturally chargeable to either traffic should be apportioned on a mileage basis, making the division as be-

885 tween freight and passenger traffic in the proportion which the freight and passenger train mileage bears to the total mileage of trains earning revenue.

With few exceptions this rule has been followed by the carriers in making their reports, and the results exhibited in the tables show the manner of its working. There is, of course, no difference of opinion, so far as the expenses 'naturally chargeable to either freight or passenger traffic' is concerned. The difficulty arises in connection with such expenses as cannot be so apportioned. For example, how can it be determined what proportion of the cost of maintaining a road-bed in good order is chargeable to freight revenue?

The confusion that exists on this subject may be best indicated by stating the various theories respecting it. According to the rule given above, expenses which from their nature cannot be easily assigned are to be apportioned on the basis of train mileage. This is thought to allow more nearly than any other arbitrary rule for the varying elements of velocity and weight. If freight trains are heavier than passenger trains, the latter are ordinarily run at higher speed, and, as is well known, the 'pound' of a train on the rail is measured by its momentum, or the resultant of velocity multiplied by weight. Curves, grades, temperature, and other factors which vary with physical characteristics of the road or with the locality in which it is built, may be regarded as constant so far as freight and passenger service is concerned.

But this rule of apportionment fails to gain acceptance by many accountants who have had large experience in railway affairs. Some claim that an apportionment fair to all branches of the railway service is impossible. They who maintain this position assume that operating expenses should be taken as a whole, and they con-
886 ceive the whole duty of the manager to have been performed if at the close of the fiscal year there remains a satisfactory margin of earnings. It is urged by others that the only solution of the problem is to determine the ratio of apportionment for those items of expense that can be readily traced to passenger and freight service, and then to adopt this ratio for apportioning the other items.

This position is less satisfactory than the one previously stated, for it gives the appearance of a solution when in reality it is but an evasion of the problem. There are other accountants who use car mileage as the true basis of apportionment; others substitute for this engine mileage; still others declare that mileage run has nothing to do with the question, and that weight of trains alone should be considered. In German and Swiss statistics the number of axles in a train serves as the basis of most comparative and proportional computations, and it is possible that further study would reveal yet other theories.

In the presence of such divergence of opinion as is disclosed above, it is certainly well to refrain from hasty judgment. The question is one to be determined by careful investigation and comparative study. But in reading the letters of the several railway officers who have favored the Commission with arguments upon this subject, one thought has presented itself that may prove the source of fruitful inquiry. It happens that the several accountants who hold the theories referred to are officers of roads that differ widely in their physical characteristics, as also in the nature of the competition to

which their business must conform. In one case the road-bed is straight and over a level country, in another there are sharp curves and heavy grades; one road is obliged to depend for supremacy
887 upon fast; another, running through country sparcely settled, can run its trains according to requirements of economy; the average temperature and humidity, also, which must affect somewhat the wear and tear of structures and equipment, are different for the several roads. Now, it is possible that divergence of opinion as to the proper method of apportioning expenses between freight and passenger service is due to the varying conditions under which the problem has been considered; and if this be true, it is of course impossible to discover any single rule to satisfy the problem. This can only be determined by applying the several rules under different conditions and comparing the results.

Such a method of procedure would be scientific, and must lead to trustworthy results. It is proposed in this office to undertake such an investigation.

888 On June 26, 1914.

PARKER recalled.

Further redirect examination.

By Mr. Wykes:

Defts.' Ex. 74, Parker, is the details of ratios, and pages 1 to 52 contain the detailed working out of the gross ton mile ratios 1, 1*a* and 1*b* for 1913 according to the method of Thompson. Defts.' Ex. 77, Parker, is a copy of the assignments and allocations of the 1913 expenses on the Thompson plan or basis. It comprehends the application of the ratios for 1913 to the expenses of plaintiff for that year.

There are three variations shown from 1912 to 1913 in the application of the ratios. The first is that I used for account No. 2, Ballast, a six-year average, instead of a five-year average as used by Thompson in 1912; that is shown on page 57 of Ex. 77.

In account No. 9, Bridges, Trestles and Culverts, I reduced the total by $20,986, cost of betterments included in operating expenses, as testified to by Mr. Delf.

For account No. 55, Advertising, page 105 of Ex. 77, I distributed the account relatively with the distribution of the same by Mr. Heiss for 1912.

For account No. 54, I accepted Delf's assignments or allocations, the data being taken from Defts.' Ex. 48, Delf. This account is Outside Agencies.

The tables in Defts.' Ex. 77, Parker, are comparable with those in Defts.' Ex. 72, Thompson, page for page, and, if there is any variation in accounts, it will show up.

The sixth year which I used for 1913, in averaging ballast by including 1913, was not available when Thompson arrived at his average in 1912. The expenditures for ballast, 1908 to 1912 in-

889 clusive, were $19,947.53, an average per year of $3,989.50. The inclusion of the 1913 expenditures, of $25,938, almost doubled the average.

Ratio 2, 1913, of equated track miles, shown common passenger and freight as 86.27%, freight and ore, 13.57%, and exclusive passenger, .16%. Mr. Thompson's attention was called to some testimony, which came into the case after his ratio was arrived at, indicating that a part of the exclusive freight trackage was maintained by the industries served thereby, which made a slight difference in his percentage. My percentage for Ratio 2 was arrived at without separating the tracks maintained by the industries. Separating that trackage, results would be, common freight and passenger, 87.26%, freight, 12.58%, and passenger, .16%. The change would not make a difference of over $150 in the intrastate passenger costs.

The expenses used as the starting point and divided in Ex.. 77 are taken from Delf's exhibits or from the books of plaintiff. Ex. 77 correctly represents what it purports to show, though there is one error, to which Delf has called attention, that may affect the result in the intrastate passenger business $2,000.

I am referring to the item "Superintendence," where there is an apparent error of $1,338. The error, if such, will by correction result in increasing the passenger cost approximately $2,000. It is purely clerical, as the result of misreading an amount.

In Ex. 77, it was my effort, design and attempt to correctly apply the Thompson method of assignment and allocation, and to produce correct results on that method. I have done everything I could to avoid error. (Defts.' Ex. 77, Parker, introduced in evidence.)

890 The division of Ex. 77 which states a part of the cost of operation of sleepers and diners, including the roadway and other costs incident thereon, includes the foreign Pull sleepers and diners.

In Ex. 77, I varied from Thompson's 1912 assignments, in that I assigned a part of the item "Docks and Wharves" to Michigan passenger business, while he excluded that entirely, on the theory of its being connected with the separately-operated property. I included it, accepting Delf's passenger assignments, assigned it on the basis of passenger cars passing over the dock, and subdivided in to passengers and baggage, mail and express, and sleepers and diners.

PARKER.

Cross-examination.

By Mr. Cotton:

The 1913 ballast figures would be first available about Oct., 1913. In account 81, Enginehouses and road expenses, I did not include the mileage of helpers and pushers, nor did Thompson.

The C. & N. W. train brings a sleeper, destined for Marquette, which comes on to the line of plaintiff at Negaunee; that car is transferred to the C. & N. W. train at Negaunee, to be pulled down to Marquette; that train is No. 110. The train that brings the sleeper to

the South Shore, when it comes on to the tracks of South Shore at Negaunee, becomes No. 3.

There is a somewhat similar operation at Champion, where the C. M. & St. P. connects with South Shore, and brings a train to the South Shore in which they have a sleeper for Marquette, which is picked up by No. 10, I believe, and carried to Marquette.

891 At Marquette, for this train No. 10, and for train No. 110, the switch engine has to take those sleepers from each of the trains and spot them over on a sidetrack, near the station. At night, about five o'clock, those sleepers are again set up into a train—No. 11—and moved back, the C. & N. W. sleeper being carried to Ishpeming, where transfer is made to the C. & N. W., and the St. Paul sleeper being carried back to Champion, where the transfer is made to the St. Paul.

In the dining service of those C. & N. W. and C. M. & St. P. trains which are under D. S. S. & A. power, the diners have been set off at various places, one time and another, but I think the more recent operation is to set them off at Houghton, and set them in again at Houghton.

Train No. 7 brings a sleeper from the Soo to Marquette; that sleeper is dropped at the station. I have never observed the entire operation by which it is again taken up by No. 8 and carried back to the Soo. After it is dropped from No. 7, it must be placed in position so it can be easily attached to No. 8 when it goes east.

There is always a transfer of sleepers at Soo Jct. twice a day. In each instance, it is taken out of the train on which it comes to that point and put into another train. The switching operations by which these cars are put on to the boat at St. Ignace is complicated by heavy cars and sleepers and diners.

The outside operations account is not burdened with any of the transportation expenses or the expense of such movements as described. There is no separation of the cost of switching or wear on the track, or such things, and no way to get at the cost, except on some basis of apportionment or assignment.

892 (All of the various exhibits marked as defendants' exhibits throughout the case are introduced in evidence, subject to objections made thereto in the course of the proofs.)

(This witness was later called to testify before the Court.)

UNITED STATES OF AMERICA,
Eastern District of Michigan, ss:

I, Elmer W. Voorheis, Clerk of the District Court of the United States for the Eastern District of Michigan, do hereby certify that the above and foregoing is a true copy of Volume 2 of Narrative Statement of Testimony on Appeal, comprising typewritten pages numbered three hundred and eighty-seven to eight hundred and ninety-two inclusive, in the therein entitled cause as the same appears on file and of record in my office; that I have compared the same with the original, and it is a true and correct transcript therefrom and of the whole thereof.

In testimony whereof, I have hereunto set my hand and affixed the seal of said Court, at Detroit, in said district, this twenty-first day of November, in the year of our Lord one thousand nine hundred and eighteen, and of the Independence of the United States of America the one hundred and forty-third.

[Seal of the U. S. District Court, Eastern District of Mich.]

ELMER W. VOORHEIS, *Clerk.*

893 Vol. 3.

On August 14, 1913.

Prof. HENRY C. ADAMS, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I graduated from Iowa college, with the regular Bachelor's degree. I then graduated as a Ph. D. from Johns Hopkins University, with economics, finance and history as subjects. I then taught these subjects in Cornell University, Johns Hopkins University and University of Michigan, until 1887, when I went to the University of Michigan, taking a full appointment. In 1888, I became statistician to the Interstate Commerce Commission, remaining in charge of its statistical and accounting work until two years ago.

With regard to railway accounts, in addition to unifying the state reports, early in my connection with the I. C. C., after the Hepburn Act, in 1906, I took charge, for the Commission, of the unification of railway accounts in the United States, giving up two years from university work. Throughout all this time, I have had to do with the many technical and practical questions arising in governmental questions of railway supervision.

The classification of accounts of the Interstate Commerce Commission was entirely devised and put into force between 1888 and 1911, when I was its statistician. Of that, I had full supervision, so far as the I. C. C. was concerned. That work was done in co-operation with the accountants of the railroads of the United States. I had full supervision of that entire branch of the Commission's work, which began as the division of statistics and ended as the division of statistics and accounts; the accounts were added in 1907, after the Hepburn Act, the reason being that until that time the Commission practically had no control over accounts. I had full control over the development of that system.

894 I served as special expert of the Railway Mail Pay Commission, composed of members of the United States Senate and of Congress, and the report made has been regarded as the standard to this time. It is always used in subsequent discussions.

I was connected with the Michigan Railroad Appraisal of 1900, being responsible for the non-physical valuation; the appraisal was divided into two parts, the physical valuation and the valuation of the commercial evidence, or value in excess of the physical value. I was later connected with Michigan railroad appraisals of 1902 and 1905.

Since severing my connection with the Interstate Commerce Commission, I have had quite a number of statistical and accounting cases which required a general review of the principles laid down in the

I. C. C. system of accounts, and some having a bearing on the rate-paying ability of railroads.

I have studied the question of dividing costs in railway transportation, so as to get at the cost of the different characters of traffic; that is called the rule for specific costs for specific services. That was the first question I took up when I became statistician to the I. C. C., bearing upon the use of statistics in rate cases. I was a member of the committee composed of State and Federal Railway Commissions that recommended the abandonment of any attempt to separate expenses into passenger and freight. In recent years, I have had a great deal to do with that question. The most important case was when I prepared an analysis that criticized that theory in detail for the American Railway Association.

The abstract of my testimony in the Michigan railroad tax cases correctly sets forth matters bearing upon my qualifications as an expert, as follows:

895 2. Member of following societies:

Member and late vice-president, American Statistical Association.
Member and late president, American Economic Association.
Member, International Statistical Association.
Member, International Association for Procuring Uniform Legislation.

3. Writings (excluding pamphlets and articles) on subjects related to this inquiry:

History of Taxation in U. S., 1789 to 1816. (Translated into German.)
Public Debts. (Translated into Japanese.)
The Science of Finance. (Translated into Japanese.)
Statistical Reports of Interstate Commerce Commission, 1888 to 1902.
Compendium of Railways of the U. S., 1902 (3 parts).
Two Volumes on Transportation for U. S. Census Report of 1900.
Special attention given to subject of History and Evolution of Taxation of Railways in the U. S.

I was an expert agent in charge of transportation work in the United States Census of 1890. I was statistician for the Postal Service Commission in 1899; that is what I referred to as doing expert work for the Postal Commission.

Since the I. C. C. was created, there have been many attempts, and there are many different rules, for making separation of costs of freight and passenger business; many experts have attempted the separation, and, as a result, a great many different methods have been worked out. I have in mind eight or ten different methods for the separation between passenger and freight.

I was one of the committee recommending the abandonment of the rule of specific costs by the I. C. C., and the costs per ton and per passenger per mile were published for the last time in the report for

the year ending June 30, 1893; the recommendation was made a year previous to that time.

896 ADAMS.

Cross-examination.

By Mr. Eldredge:

In the absence of the record of purchases, I think a railroad is entitled, as a matter of justice and equity, to only the average value of the lands in the territory it serves, and it would give the railroad too high a value for its right of way to take sales of lands immediately adjoining the right of way.

That goes to the question of what element of railway property ought to be valued on the cost-of-reproduction theory. I deny, absolutely, that lands should be valued in that way. I think a thing that can be reproduced, like a locomotive, can be valued on the cost-of-reproduction theory, and a thing that cannot be made in unlimited quantities, at uniform cost, ought never to be valued along those lines. I think it is much better to take the average value of the property served than to take the contiguous property, to value the railroad land. I think it fairer to the public, and to the railroad, as well, as I do not concede anything which is unfair to one party could be fair to the other. I think there is a harmony of interest.

ADAMS.

Direct examination resumed.

By Mr. Wykes:

The rule for the ascertainment of specific costs for specific service at one time used by the I. C. C. is as follows:

"All expenses which are naturally chargeable to either freight or passenger traffic should be entered in their respective columns; expenses which are not naturally chargeable to either traffic should be apportioned on a train mile basis, making the division as between freight and passenger traffic in the proportion which the freight and passenger train mileage bears to the total mileage of trains earning revenue."

897 This rule was included in the instructions to the carriers for annual reports to the I. C. C. The division between passenger and freight service of the operating expenses was required for the last time in 1893, and appeared for the last time in the report of 1894. Preliminary to the abandonment of that rule, action with regard to it was taken in the meeting of the Association of Railroad Commissioners.

The resolution of the Association of Railroad Commissioners of 1892, voting to eliminate that requirement, was printed in the proceedings of the Association, which has always been printed by the I. C. C. It is not included in the report of the Commission to Con-

gress, nor are these proceedings included in the annual report of statistics to the Commission. I have not with me a copy of the entire resolution, but one paragraph of it is as follows:

"The test of actual practice fails to satisfy us that these rules are of any utility either to the companies, the States or the Nation. Indeed if not substantially correct they could not be expectetd to be useful and may prove positively vicious. We know that results have been reached by the application of these rules for division which are grossly erroneous, not to say preposterous."

Q. I think you stated that the division of expenses between various classes of traffic, such as freight and passenger, and interstate passenger and interstate freight, and intrastate passenger and intrastate freight, has been attempted a good many times by different experts?

A. Yes sir.

Q. And that those experts differ materially in the factors upon which they make their division of the common expenses?

A. That is true.

Some of the factors used by experts, in making the division of that portion of operating expenses that cannot be directly assigned to passenger or freight services, are: One factor is car mile-
898 age; another is the ratio of direct charges; another may be called the dollar of revenue method; another is revenue; another is locomotive mileage; another is the revenue train mileage; and there is one which is a combination of the locomotive mileage and the car mileage. Those are all of the factors I am acquainted with, although there are quite a number of minor principles adopted in the development of the full methods of various experts, but these are the leading factors, so far as I know them.

Train weights are used as a modifier in some of the methods, and some have made use of the time and use of track and property by the different classes of traffic, but the greatest use of that, as I understand it, is in connection with the localization of property to the various services, and not the separation of expenses; however, that has been used. I have studied the work of experts, or men professing to be experts, who have attempted divisions of costs. I have studied certain methods by different experts who make use of each of these various factors in greater or less degree in assigning common costs between passenger and freight. Some expert has used all of these factors, with the exception of the dollar of revenue method.

I have studied the rule promulgated by the Postmaster General in his method for separating between passenger and freight to arrive at the railway mail pay. I have studied the rule of Frank Nay, Auditor of the Rock Island, in the Advance Rate Cases before the I. C. C.; also the method of John G. Drew, Comptroller of the Great Northern, in a case before the I. C. C..; also the method of J. P. Muller in the Pittsburgh Coal Rate Case, and the method used by the I. C. C. prior to 1894; also the rule used by James Peabody, Statistician of the Atchison, Topeka and Santa Fe. Of course, some

of these men have appeared in many cases, and there are
899 other rules than these I have given. Hillman has made a great many assignments applying rules in the Ohio Lake Cargo Rate Case, in what is known as Hillman's Florida formula before the I. C. C., in Hillman's South Dakota formula before the I. C. C., in Hillman's Minnesota formula before the I. C. C., in Hillman's Hocking Valley formula before the I. C. C., and Hillman's formula in Norfolk & Western. These formulas differ as to the application of these fundamentals in the different cases. Hillman's rule varies with the cases. Mr. Worthington appeared as an expert in the Pittsburgh Vein Operators Association Case vs. Wheeling & Lake Erie on the division of costs, and applied a rule of his own.

There are many modifications of these rules. You could find variations in the application of these rules for almost every case that is tried. The factors referred to and enumerated are given varying weights by the different experts in the separation of common expenses between passenger and freight.

One expert gives principal weight to certain of these factors, and another gives principal weight to certain others; the different experts, in separating passenger and freight expenses, will give varying weight in applying these various factors; one will use car mileage as his principal factor, and another train mileage, and so on, through the list. The various methods of the various experts applied to the same property would bring very divergent results. I have investigated to determine the range of difference in the results.

I have taken the total operating expenses of plaintiff, and applied the percentages for these various principles that I enumerated, for the purpose of illustrating how divergent would be the results
900 of these various principles, when applied. I have applied it to the whole, instead of the common expenses, for the purposes of illustration, and the divergence of opinion, as to what constitutes a common expense, seemed to justify that method for the purpose of illustrating the point.

Rule.	Passenger assignment.		Freight assignment.	
	Amount.	%.	Amount.	%.
Car mileage	$289,698	14.5	$1,708,216	85.5
Ratio of direct charges	453,526	22.7	1,544,388	77.3
Dollar of revenue method	525,441	26.3	1,472,473	73.7
Combination of revenue and locomotive car miles	607,366	30.4	1,390,584	69.6
Revenue basis	657,314	32.9	1,340,600	67.1
Locomotive mileage	925,034	46.3	1,072,880	53.7
Revenue train mileage	954,903	47.8	1,043,011	52.2

The expenses taken for this illustration are for 1912, for Michigan; the various rules applying to the total expenses would lead to the above assignments.

I find that some experts vary the revenue train mileage basis by the inclusion of switching mileage. Certain of the items, with some experts, are divided on the basis of the revenue train mileage plus the switching mileage. The mileage of switching locomotives is

not a measured mileage, but a mileage of six miles per hour. I have found no expert who uses one of these factors straight, without combination with others, to make his divisions. Mr. Peabody, who takes train mileage as his principal factor, does that more nearly than any other expert I know of, but makes variations.

It is possible for the expert, by giving greater weight to a certain factor and less weight to a certain other factor, to increase or decrease, materially, the common expenses which would be assigned to a particular department, as to passenger or freight. The variations in assignments, in the cases which I have examined, I would
901 regard as surprisingly large. The range of variation in application of different methods to the operating expenses, or a block of the operating expenses, of the railroads of the United States has been shown by certain exhibits prepared by Mr. Muller in the Western Freight Rates inquiry. He applies seven methods; those methods are, as named by him:

Name.	Method.	Remarks.
James Peabody and Frank Nay.	Train miles.	
John G. Drew.	Revenue service locomotive miles.	
F. J. Moser.	Locomotive miles.	All switching assigned to freight.
Frank Nay.	66-2/3% on revenue, 33-1/3% on train miles.	
C. E. Schriber.	20% revenue train miles and switching 80% freight and passenger gross earnings.	He suggests that one is adjusted to wear and the other to weather.
Frank Nay, D. A. Worthington and C. W. Hillman.	50% train miles, 50% car miles.	
J. P. Muller.	50% locomotive miles including switching in freight, 50% car miles.	

Those methods were applied to maintenance of way and structures expenses for 1910 for all the railroads of the United States, being a total of $368,394,260. The greatest variation between the different methods is $74,981,384, passenger. That is between the James Peabody and Frank Nay train mile method and the J. P. Muller method, the former giving to passenger $171,321,530, whereas the other method gives $96,340,146. In the freight, the highest is
902 the Muller method, which gives $272,054,114, while the lowest method gives to freight $197,072,730. The method that is highest in assignments to freight is lowest in assignments to passenger, and vice versa.

Following is a table, by Mr. Muller, showing the results of allocation of $368,394,260 of maintenance of way and structures expenses

for all railroads in the United States for the year ending June 30, 1910, by different methods named, with greatest variation:

Name of accountant and method	Freight.	Passenger.
James Peabody & Frank Nay: Train Miles	$197,072,730	$171,321,530
J. G. Drew: Rev. Service Loco. Miles	205,630,234	162,764,026
F. J. Moser: Loco. Miles. All Swtg. to Freight.	236,955,019	131,439,241
Frank Nay: A 66⅔% Rev. B 33⅓% Train miles	242,183,958	126,210,302
C. E. Schreiber: A 20% Wear-Rev. Train-miles plus Swtg. miles 95-5 B 80% Weather Freight & Pass. Gross Earnings.	257,500,080	110,894,180
Frank Nay, B. A. Worthington & C. W. Millman: A 50% Train-miles B 50% Car-miles	257,572,222	110,822,038
J. P. Muller: A 50% Loco. Miles incl. Swtg. F. 84.6-P. 15.4 B 50% Car-miles	272,054,114	96,340,146
Greatest Variation	$74,981,384	$74,981,384

I have applied certain of these various methods to the accounts of a single railroad, to indicate the variation in application of the different methods. I have here the Atchison, Topeka & Santa Fe for
903 the month of January, 1910. I took the maintenance of way and structures expenses, and the methods I applied there were the post office department rule, the method used by Mr. Nay in the Advance Rate Cases, the method used by Mr. Drew, and the method used by Mr. Muller in the Pittsburgh Coal Rate Case; I have included, also, the old I. C. C. method used prior to 1894, and the method used by Mr. Peabody, who is statistician to the Atchison, Topeka & Santa Fe. The total of this block of expenses is $1,567,985.96. By the post office method, there is assigned to freight $1,032,079.55 and to passenger $535,906.41, being 65.82% to freight and 34.18% to passenger.

The application of the Nay method gives to freight service $831,659.77 and to passenger $736,326.19, being 53.04% to freight and 46.96% to passenger.

The Drew method results in the assignment of $921,034.97 to the freight service and $646,950.99 to the passenger service, being 58.74% to freight and 41.26% to passenger.

The Muller method results in the assignment of $1,102,930.25 to freight and $465,055.71 to passenger, being 70.34% to freight and 29.66% to passenger.

The old I. C. C. method results in the assignment of $847,924.60 to freight and $720,061.36 to passenger, being 54.07% to freight and 45.93% to passenger.

Mr. Peabody's method results in the assignment of $847,924.60 to freight and $720,061.36 to passenger, being 54.07% to freight and 45.93% to passenger.

904 The greatest variation is indicated by a comparison of the Muller and Nay methods. I have applied different methods to parts of the South Shore expenses, using operating expenses as reported to the Michigan Railroad Commission. I made use of nine different methods, taking accounts 4, Rails, 25, Locomotive Repairs, 9 Bridges, Trestles and Culverts, 24, Superintendence, Maintenance and Equipment, 55, Advertising, and 82, Fuel for Road Locomotives. I found that the highest and lowest differences resulted in these variations, expressed in percentages, for rails, 72%, locomotive repairs, 111%, bridges, trestles and culverts, 154%, superintendence, 143%, advertising, 26%, and for fuel for road locomotives, 4%. The percentage is the percentage of difference between the highest and the lowest, or the per cent which, multiplied into the lowest and added to it, would produce the highest amount.

The methods I used in arriving at those percentages are the post office method, the Drew method, the Frank Nay method, the Worthington method in the Wheeling & Lake Erie Coal Case, the Peabody method, the Chicago, St. Paul, Minneapolis rate case method, the Virginia coal case method, and the Muller method in the Pittsburgh case; and I also put into this computation the Woodlock method, which is a method of Mr. Woodlock, the writer for the Wall St. News.

The Muller produces the highest assignment to freight. Out of a total of $15,112, the assignments to passenger were: Post office and Woodlock, $6,875, Drew, Nay, Worthington and Peabody, $5,576, and Muller, $3,992; the sixth and seventh methods fall in between.

The conclusion I arrived at from the study of these methods is that they are reliable or not reliable, according to the judgment of the man that makes them. You do not get beyond, by the so-called statistical methods, the judgment of the man.

905 One expert may think it right to take in train weights in determining the wear upon rail, and another may not; their results are no more trustworthy for a rate case, or for any conclusion, than the judgment of the man who applies the rules. If two experts applied the same rule, in the same way, they would reach the same re-

sult, but their judgment comes in in determining what modification of these fundamental principles they make in the rule that they select.

So far as I know, judgments have not agreed on any particular factor. If they had, there wouldn't be this great variation in results. I think the method is pernicious; I wouldn't have anything to do with it, except to criticize it. There are so many arbitrary elements in the application of this rule that when one comes to a conclusion he hasn't anything he can rely upon. It seems to me to be an apparent demonstration by the use of figures which, when analyzed, is no demonstration at all, and simply a way by means of which men express their judgments. You might just as well take the judgments in the first place, without going through all of this analysis.

The Master: Isn't this a method of reaching their judgments?

A. I don't even regard it as that, because the questionable items in it are so numerous.

In using the word "pernicious," I used it in a sense that any illogical argument is pernicious leading to an untrustworthy result. My idea is that the results of the application of these methods of separation of common expenses, if untrustworthy, in my judgment, they cannot be separated with any degree of accuracy as to warrant their use in determining a rate case.

In condemning these assignments and these rules for assignments, I do not condemn them for the use of the railroad itself; I
906 condemn them as used by the courts in determining rate cases They may be very useful for the operating officer, for comparisons or for testing expenses, and I made that modification so that I wouldn't be understood as saying that these rules are absolutely useless for all purposes. They are approximately reliable for the use of operating officers, for the reason that in the case of comparative use of statistics you can have mistakes in your rules, but, if your mistake is uniform from year to year, the result may be of advantage to the operating officer in testing the relative economies of various divisions, or testing the operating results from year to year.

In a rate case, it seems to me you must have things that are accurate, but, for comparative use as statistics, it is not necessary to attain that degree of accuracy. I consider they are not available in rate cases, because they are not accurate, and because they require, in arriving at conclusions and applying rules, such an extensive use of arbitraries and judgments. I think any arbitrary; if it is an arbitrary of the nature of a judgment, ought to be excluded in what is called a computation and a demonstration.

ADAMS.

Cross-examination.

By Mr. Butler:

I am not now connected with the I. C. C. I am aware that it is now considering, with the Association of Railway Accountants, the establishing of rules for the division of costs between freight and

passenger. That matter is now receiving attention, in that the I. C. C. has made orders requiring information to enlighten it on that subject, to the extent, as I understand it, that it has requested from the carriers a statement for the separation, so far as the separation can be made, and the rules they would adopt where
907 they do make separation. They now have under active consideration the re-establishment of a direction for division of these costs between freight and passenger.

Certain circulars have been issued under the direction of Commissioner Meyer, and over his signature, asking for certain information. I know, also, that Commissioner Meyer is committed to this theory of specific cost for specific service. I do not know that any other Commissioner is committed to it. I know that it is the policy of the I. C. C. to let each Commissioner develop his department very much as he sees *hit*, and, in my judgment, it would be an erroneous conclusion to say that the I. C. C. has reversed or intends to reverse its policy with regard to the assignments of expenses between passenger and freight.

I- what I have said, I intended to distinguish between the official acts of Commissioner Meyer and the Commission itself. This matter would be a subject of statistics. The work of the Commission is done largely by divisions. In the ordinary and usual routine of business, for the preparation of such an order as required the separation of costs between freight and passenger, or details of the work, its supporting foundation, and all that, would be prepared in the division of which Commissioner Meyer is the head. If they approve the recommendation of the head of the division, an order on the subject would be made, if he recommended it.

I would not care to forecast the position of any other Commissioner on the subject. I do not intend to give the impression that this subject is not being considered in the ordinary and usual way that the making of orders on such subjects is considered. It is being considered. A great many things are considered that are
908 never consum-ated. The order in force for this division prior to 1893 or 1894 was in effect when I took my position, in 1888. The Commission was created in 1887, and before the end of the next year they adopted this rule, from the reports which had been made and were being made to the State Commissions, and which remained in force to 1894.

Q. That is to say, in the reports that the carriers were making to the State Commissions prior to 1888, as you understand the fact to be, the common expenses—the non-allocableexpenses—between the freight and passenger departments were customarily, and as a general rule, the country over, divided on the basis of revenue train miles, and that, when the I. C. C. came in, they found that established unit and adopted it, which you found when you came to the Commission?

A. Yes sir, in the first report of the I. C. C., it said that so far as reports were concerned it desired to begin with the reports that were being used.

I have not at any time, in connection with my official work, un-

dertaken to lay down any rule, or prescribe any method, for ascertaining the cost of doing freight or passenger business, or any part of either. I have made study of that question, with the view of ascertaining with approximate exactness the cost of doing freight or passenger business, or parts of either. I commenced that study in 1888; I studied it for four years, and agreed very heartily with the abandonment of the attempt to make that separation.

I agree, perfectly, with the recommendation of abandonment, and was a member of the committee that recommended it. So far as the resolution, part of which has been read into the record, is concerned, I concur in it, and I signed that report, and I suppose that is an assertion that the thing is useless. I believe that
909 all efforts to ascertain the cost of doing the freight of the passenger business on a railroad system is useless, for any public purpose, for any rate or tax question, except that it is useful for making operating comparisons. I don't think the thing is sufficiently accurate so that it can be relied upon for use beyond statistical and comparative purposes.

I think I am versed in, and an authority on, the subject of accounting, and especially as to railroad accounts. My testimony was confined to rate making; that was the purpose of submitting these variations and these inconsistencies.

Q. The idea was to show the ramifications or variations possible to support your conclusion that, here, now, if the ascertainment of cost is necessary we are up against the impossible thing, was it now?

A. Yes sir. And that is my belief.

Q. And you further believe, do you not, that it is beyond the possibility of scientific accounting, or accounting upon sound principles, to ascertain the cost of doing passenger business on the D. S. S. & A., either as a system, or in Michigan, or the intrastate or interstate passenger business in either Michigan or Wisconsin?

A. Yes sir.

Q. And you believe, do you not, that, as far as the art of accounting is concerned, it would be utterly impossible for public authority to prescribe, or railroad companies to invent, any scheme of keeping the books of the carriers to show the cost of doing the intrastate freight business on any road, in any part of the country?

A. I do not think it lies in the ability of accounts to accomplish that result.

Q. Or the total freight business of any road in any State?

910 A. I think so.

Q. Or the total freight business of any system of railroads?

A. Yes sir.

Q. And you would say the same as to passengers?

A. Yes sir.

Q. I want to make this thing complete; your idea is that the truth cannot even be approximated with reasonable nearness?

A. For a demonstration, yes sir.

Q. I mean for telling whether a rate is yielding anything above its cost—the cost of doing the service covered by it?

A. I think that lies beyond the ability of accounts.

Q. You think that lies beyond the ability of accounts to ascertain whether or not passenger rates on D. S. S. & A. in Michigan are sufficient to pay the expense of carrying that service?

A. I do. I think the methods of arriving at reasonable rates, resting on the specific cost of specific service, are methods which do not lead to trustworthy results.

Q. I am now trying to confine myself to the question of ascertaining the cost of a class of business; you think it couldn't be ascertained whether or not three-cent passenger fare in effect on the intrastate business in Michigan paid the cost of doing the business, do you not; you can't get even that close to it, can you?

A. It is, of course, possible to make your maximums and your minimums so ridiculously high and ridiculously low that you can be pretty sure you are in between, somewhere.

I do not think you can get near enough to state whether one cent a mile is too low, or three cents is enough. You can approximate anything, if you rely upon your arbitraries, but I don't think
911 you can approximate the cost with sufficient exactness. I would be willing to say that ten cents paid the cost, and that nothing didn't pay the cost. I think it could be approximated more nearly than that, but not near enough to satisfy the rules of specific cost for specific service. I think you have got to have it exact if you are going to demonstrate confiscation.

I have never worked out to see where I would let my judgment rest, but, if I must answer that, your Honor, I will say four cents up, nothing down. I got the minimum so low, as I wanted to be sure. I have never been a railroad operating man, and never occupied any position where I controlled railroad operating expenses, either passenger or freight. I never, in railroad employ, occupied any position where I was required to form a judgment as to the cost of business in the discharge of my duties.

Q. You do know, of course, certain truths that are generally recognized as about right, as, for example, that there are certain expenses that can be said, with truth, to be passenger expenses and certain other expenses that can be said, with truth and certainty, to be freight expenses; you recognize that as a truth of the railroad profession?

A. No sir.

Q. You don't believe that?

A. No sir.

Q. You don't believe that the coal that pulls the suburban train that we are looking out at, here, on this lake front in Chicago, from here up to Jackson Park, is an item of passenger expense?

A. I think it may be.

Q. Coal costs money, and you ascertain what it costs; so you do know that to run that train it costs so much for coal, don't you?

912 A. Yes, I know that it is possible to weigh out the coal to the passenger engines and to the freight engines, and that, if you are willing to rest satisfied with that as an allocation of expense to passenger service and freight service, you can do through accounts.

Q. Now, of course, your point is that the passenger conductor would, ordinarily, be considered a passenger expense, wouldn't he; also the engineer, fireman, crew, and ticket seller?

A. Yes.

Q. Now, of course, you can say that the coal in a freight engine, that is weighed out to the freight engine, and hauls the train down to Newberry, sidetracks there for a passenger train to go by, and something delays the passenger train up the road, it stays there, burning coal for two hours, you do know with perfect certainty that the coal that freight engine is burning on the sidetrack at Newberry is a passenger item, and not a freight item at all?

A. The recognition of that and a great many other interchangeable items is the reason why I say that even those so-called direct expenses are not always direct.

Q. That is the reason you say nothing can be allocated?

A. That is the reason I say practically nothing can be allocated. I think it would be justifiable, as an accountant, if the rest of the rule could be applied, to take the direct charges on the basis of vouchers; I would be willing to allow that.

Q. That is to say, you think that, where the allocations are made as a matter of current bookkeeping, and well done, they are sufficiently accurate for the purpose even of a rate case, as far as the allocations go?

A. Yes, I think it would — reasonable to accept that.

913 The rules I have referred to pertain to common expenses. It is admitted there are certain other charges which do not take into account the fine distinctions we have discussed. Practical railroad accountants consider that not more than 20% of accounts can be located from the vouchers between passenger and freight. To allocate 60% to 70%, they use arbitraries, and they are using arbitraries and assignments in what they call tried accounts; these arbitraries are not negligible.

In my judgment, not more than 20% of the operating expenses, on the average, could be allocated definitely and certainly, with sufficient approximation to use in a rate case, where you want to find the cost. That would be found in locomotive repairs and car repairs and coal. From the pay rolls, you can assign the wages, except where there is a single employee doing both freight and passenger business, and where there is an express agent and telegraph agent; there are a few of those accounts.

I am aware that accountants for the States in all these state cases, which have resisted railroad suits to declare rates confiscatory, have allocated or claimed to have allocated 60% to 70% of the total. 60% is a per cent that has come in very recent years; for years, the highest per cent claimed by those who discussed this question was 40%, and, if you analyze that 60%, you will find that there are a large number of arbitraries in it. Therefore, I am sure that whatever they call a direct cost covers things that are not direct costs.

I am aware that many railroads are still keeping separately, by systems and states, the freight and passenger cost, as a current matter, from day to day, on their books; they have to, to be prepared for

anything that comes; also, many use the figures for their
914 operating control. My impression is that a much smaller number of the railroads divide this by states than by operating sections; indeed, I don't know of any road now that currently keeps the divisions by states. I do not know of any that does not keep the division by states. Very frequently, the accounting division corresponds with the operating division of a railroad. I know what the general rules of carriers are as to dividing the common expenses between passenger and freight, as a matter of detail on their books. In the Atchison, for example, those are published; it comes out practically with the old I. C. C. rule, that modification being for the non-allocable items, and most extensive use of revenue train miles.

Q. This is what I am leading to: Isn't the fact that the revenue train mile, or substantially that basis, is in common and general use, and has been for a quarter of a century, by the railroads of this country for making that division for their own purposes on their own books, as a current matter?

A. Yes sir, I am inclined to think that is true, but that purpose is the operating purpose, and the purpose for executing their inter-divisional contracts, as, for example, on a locomotive pool or a car equipment pool, they make use of very many rules and arbitraries, which are mentioned in their contracts, so as to get the proper burden of expense to the various divisions of their property.

When they come into rate cases, they make variations of those rules, as has been shown by the rules that I have referred to this afternoon. I am under the impression that in the Oklahoma case the Rock Island modified its rule. I cannot specify any other instance, as I never looked that up.

The revenue engine mile and revenue train mile produce very close to the same percentage, but not the same. Used by itself, the
915 car mile basis for division of common expenses between passenger and freight I think absurd; used by itself, it is unsatisfactory.

Q. And direct charges, you think, is another humbug, don't you?

A. Along with the other humbugs, yes sir.

Q. Don't you want to kind of specially emphasize that direct charges business; isn't that in principle? Here are certain expenses of factory; some can be charged to one thing and some to another, and then there are common, and then isn't it the mightiest humbug on the face of the earth to divide the common on the relation of the allocated, as a principle for general application.

A. I am not acquainted with all the humbugs on earth; I think it is a humbug.

Q. Pure and simple, don't you?

A. I think it is an unfortunate rule.

Q. You don't think it is supported by any reason at all, do you?

A. I would say "no" to that, if my answer did not imply that I did support some other. I don't think the allocation by direct charges is a sound rule for allocation, primarily for two reasons, one being because there is a question as to what are direct charges, and the other being because you may assign an expense on the percentage

of another expense and there is no relation between those two expenses.

I took the total operating expenses for different items, to illustrate the large divergence-es that come from the application of those principles, and so as to make clear that the actual method used, which is made up by selecting from these principles, must rest upon
916 the judgment of the man. The showing would be more striking to take the totals, but the percentages would be the same.

The table on page 182 of my affidavit was designed to show, by primary accounts, the difference in the various methods. In making that table, I used, I think, nine methods, and on that one account six of the nine produced the same results. The percentages would not be the same throughout, because in other accounts they may have used other combinations. I selected the six accounts arbitrarily, and applied the different methods to each account. In account No. 4, Drew, Nay, Worthington and Peabody all followed the same method.

Q. Prof. Adams, in your affidavit filed in this case, I find the following language, and it begins on page 180:

"Q. What have you to say of the allocation of expenses as between Michigan and the other states through which the D. S. S. & A. R. R. operates?

A. This is a very large question. I was for three years a member of a committee representing the state railway commissioners and the railway accounting officers of the country, appointed for the purpose of devising rules for the assignment of operating revenues and operating expenses by State lines. So far as I remember, the only resolution which received unanimous approval was the resolution which in effect dissolved the committee. It is easy enough to get a rule which seems all right on the face of it so far as the localization of either revenues or expenses is concerned; but when one puts these rules together and applies them for the purpose of discovering the net operating revenues by states, the limitations of the rules which before had appeared so plausible, become evident. The unsatisfactory character of rules of this sort is that items respecting which some degree of judgment must be exercised are so numerous as to cast doubt upon any result which rests upon them. I might also say that from my study of this general question, I should hesitate to approve Mr. Delf's statement that ninety per cent. of operating expenses could be allocated directly as between the States. If this be correct it must be due to the unusually simple conditions under which the D. S. S. & A. R. R. operates.

Q. What have you to say of the separation of operating expenses between the passenger business and the freight business?

A. This is an old question. In 1893 the Interstate Commerce Commission abandoned the attempt to secure from carriers this class of information, on the ground that it could not be given with sufficient accuracy to serve any practical need in the testing of reason-
917 able rates. I have kept in touch with the various phases of this question since 1893 because of my interest in the rate cases that have been put up from time to time to courts and commissions, and that which impresses me the most in this matter is the

great variety of rules that have been named for the separation of passenger and freight expenses. These rules are not always consistent, either in the principles upon which they rely for the separation of common expenses, or in the relative emphasis which they place on the common principles recognized.

In order to indicate the wide range of results which follow the application of these various rules the following statement is submitted, designed to indicate the differences which show themselves in the application of various well recognized rules to certain of the primary accounts of the D. S. S. & A. R. R. To be exact I have tested this matter by applying nine rules which are advocated by different experts and which have been used in different cases, to the operating expenses as reported to the Michigan Railway Commission. The percentages in the statement indicate the difference between the highest and the lowest amount assigned to the passenger service of the total amount of expenses charged to the account named. As the purpose of this statement is to illustrate the point submitted above, I have not gone beyond the application of these rules to six primary accounts."

Then follows a tabulated statement, the caption of which is "Statement," and there is a column at the right, the caption of which is "Difference between lowest and highest assignments." The items in that statement are as follows:

Account 4, Rails	72%
Account 25, Locomotive Repairs	111%
Account 9, Bridges, Trestles and Culverts	154%
Account 24, Superintendence, Maintenance of Equipment	143%
Account 55, Advertising	26%
Account 82, Fuel for Road Locomotives	4%

"The possible range for estimates and arbitraries is too broad to warrant any considerable degree of confidence in the results arrived at."

Does the language in this affidavit to which I have just called your attention fairly state your present views upon the subjects?

A. Yes sir.

Q. Now, yesterday you gave me the impression that you thought that any attempt to divide operating expenses between freight
918 and passenger was utterly useless, or worse, in so far as the results would have any value for the purpose of making a rate or testing the validity of a rate in dipute?

A. Yes sir. That conclusion is grounded upon the reason that sufficiently accurate results cannot be obtained. I do not think cost of specific service should have anything to do with the specific rate covering that service, primarily because it is adopting a rule which is incapable of being worked out with satisfaction; also, the reason that transportation is a unit—a service rendered by a large number of agencies.

It is my view that the aggregate operating expenses ought to be taken into account in making a schedule of rates which will yield the aggregate revenue; this it is possible to secure from the records,

while it is not possible to obtain the specific cost for specific services, in my judgment. Even if the specific cost could be determined, I should be disinclined to accept the rule of specific cost for specific services, because it would seem to me to prevent the railways adjusting their rates so as to render the highest possible service to the public. It would harm the railroads by checking the development of the country, if they were now put into force.

My refusal to accept the rule of specific cost would apply to the intrastate business, taken as a whole, in any state, as compared with the interstate business, taken as a whole, in the same state. My judgment is that the cost of doing the entire intrastate business is not obtainable with reasonable accuracy for use in making intrastate rates. If it was, it should not be the test of reasonableness of either intrastate or interstate freight or passenger schedules taken as as a whole. If the rule is to ascertain the specific cost of the intrastate business as against the interstate business, each being taken as a whole, in any state, then it is my judgment that all
919 effort to ascertain such cost would be futile, as far as rate making is concerned. In my judgment, the application of the rule would be pernicious and harmful to the country and the railroads.

Q. Take the passenger business of any carrier, as a whole, as compared with its freight business, as a whole, I understand you are of the opinion that the cost of either cannot be ascertained with any reasonable degree of approximation, and that an attempt to do so would be futile?

A. That is my opinion, yes sir, futile for the purpose of rate making. The making of rates on that basis, even if the cost of freight and passenger could be ascertained, would be pernicious and injurious to the country, the carriers and the public, in my judgment. I think that under certain conditions it may be good business, reasonable and beneficial to both parties, for the rate making authority to be permitted to make the freight or passenger rate so low that some part of the expense of one would have to be borne by the other class of business.

Rates ought to be permitted so that the shipper of one class of freight—e. g., first class—should be required to pay some part of the expense of hauling a lower class, like grain of the farmers to market, if the rate making power believed it sound policy to do so. The question of whether it is permitted under decisions of the court calls for a legal opinion, which I am not competent to make. I think the rate making power ought to be permitted to so make the rates that the shippers of freight would have to pay a part of the expense of passenger transportation, if in the opinion of the rate making power it was sound public policy to do so.

I think transportation is a unit, and the application of ordinary business priciples to all of these traffic questions is desirable.
920 The unit would be described by the system undertaking the service, and the property used by that system would be the physical expression of that unit. I think the rate making power should be permitted to discriminate between different classes of passengers, and ought to be permitted to require railway companies to

carry passengers free if, in the view of that power, it would be wise from the standpoint of all concerned and the public and the carriers to do so. The difficulties arising out of our forms of government must be overcome before you can have a properly organized body for the supervision of railway transportation.

I think any charge which under strict and proper accounting goes to the capital account of a railway or a public service industry is a charge to be included in the sum upon which the public service industry is permitted to secure, or ought to be permitted to secure, a reasonable return.

The prices paid by the operating company is not in all cases, in my opinion, a satisfactory test, though it is where there are conditions of free sale, and no comity of interest between the parties—what we ordinarily recognize as a free market. The price paid for a property 50 years ago would be the test now, provided the proper debit and credit charges to the capital account had been maintained to the proper account during those 50 years. It should be taken, provided it is taken in connection with all the accounting entries that properly record the transactions of the company during the 50 years. They would affect what I call the proper charges to the capital account, which is, as I have stated, the figure that should be taken to measure rates.

My views, as to the rule of a specific cost for specific services, are not affected by my views respecting a proper procedure for making rates.

921 Take a purchase of real estate 50 years ago, at $5,000, and assuming the same real estate now used for the same purpose as it was used for 50 years ago, I think the $5,000 is the sum that ought to be included in what is called the value for determining the rate. I do not mean, by value in its use there, what is called the fair present value as that term has been used by the Supreme Court of the United States in rate cases. I understand my answer is not in harmony with some of the views of the court.

The value for ad valorem taxation may be higher or lower than the value for rate making purposes, or it may be the same. The comparison would not tend to shed any light on the propriety of the tax or of the rate valuation.

For the purpose of what I have said, all of the material entering into the construction of a railroad is unlimited. The commercial value of a railroad is the value which arises upon its earning capacity, arrived at from the books. If you are given a true net revenue, then you would get at the commercial value by capitalization. You take the net revenue, assume a reasonable percentage of return, capitalize that revenue to arrive at a capital fund which would produce that return, and that would be the commercial value of the property.

I have no personal judgment as to what is a reasonable rate of return, but I have always substituted for my judgment the judgment of the market, and that, after allowances for uncertainty of revenue, would seem to me to be five or six per cent.

The commercial value might be greater or less than the physical value, arrived at by the reproduction method. My answer is that

neither the commercial value nor the physical value as deter-
922 mined by inventory should be accepted as the basis for mak-
in a rate; I make this to preclude my assent to the proposition that the physical valuation being made by engineers represents the value upon which return should be made. The commercial value should not be used as the basis for computing the return, or determining the reasonableness of a rate, as it is at issue in the case. It depends upon the rate; as you make the rate, you increase or decrease the commercial value. Therefore, you cannot take the issue in the case as the basis for computation.

In my opinion, the engineers have not, by the methods they have adopted thus far, so far as I am acquainted with them, arrived at the correct conclusions for the testing of rate cases. In my judgment, the engineering profession has been in error in the inclusion, in arriving at real estate values, of all their multipliers; also, the application of percentages for contingencies seems to me to have been over-emphasized.

In my direct testimony, I did not intend to suggest any method to be used for the separation of operating expenses on South Shore between passenger and freight. I intended to criticize, as useless, the method which had been employed, or any other ever employed or that could be devised.

The portion of my affidavit read this morning was for the purpose of sharply illustrating the different results that could be obtained by different methods, and for the purpose of establishing my claim that they are all wrong. I am not conscious of having selected the instances calculated to bring out in a glaring way the different results that could be reached by the different methods. I have never prepared anything that would do it in a more glaring way. I have never seen it illustrated more glaringly, though I think what was referred to as prepared by Mr. Muller would produce the same result more convincingly, because it covers larger figures.

923 I did not know that at the time I made the affidavit, but learned it since, and brought it in to more convincingly present the facts. I selected accounts 4, Rails, 25, Locomotive Repairs, 9, Bridges, Trestles and Culverts, 24, Superintendence of Maintenance of Equipment, 55, Advertising, and 82, Fuel for Road Locomotives, and applied to each item nine different methods. I distinguish between car mileage as a factor and the rule that makes use of car mileage as a factor.

On the item of rails, $15,112 was the system expenditure for 1910. The factor used by the post office department for rails was revenue train mileage; Drew's was revenue service locomotive mileage. I cannot give the miles used in making the calculation according to the Drew method. I think those came from the annual report to the I. C. C. or State Commission, and that is true of the revenue train mileage, that the post office department uses.

Nay used the revenue train mileage for rails. The Worthington method was one-half on train mile basis and one-half on car mile basis. Peabody uses the revenue train mileage, the same as the post office department. The Chicago, St. Paul and Minneapolis

case method was 90% on weight and 10% on earnings; that was worked out by J. T. Muller. The Virginia Coal method was 90% train weights and 10% earnings. I have not the definite figures for that account for those two methods.

The Virginia Coal case was the Hillman Virginia method. The various Hillman methods were taken from a brief of D. A. Worthington, receiver of the Wheeling & Lake Erie. The Ohio Lake Cargo method was 50% car mileage and 50% train revenue for account 4, Rails. Hillman's Florida method is all train weights; his South Dakota method is 90% train weights and 10% gross earnings on traffic, excluding switching, mail, etc. The Hillman,
924 Minnesota, Alabama, Hocking Valley and Norfolk & Western formulas were 90% train weights and 10% earnings (gross or net). The Hillman I. C. C. formula is 90% freight revenue and 10% passenger revenue.

I approve of none of these for dividing the rails. I consider all the Hillman methods just referred to as valueless for the purpose of dividing the cost of renewal of rails between freight and passenger departments.

That whole theory of assignments has had a historic development; it was used in Germany, where they used wheelage and where their cars were small, and they had some cars with four wheels, others with eight wheels, and then they began to use big cars, with more wheels, so they used wheelage as the basis, and others used axles as the basis. At one time in this country, when Mr. Albert Fink was chairman of the trunk line, he endeavored to have the railroads of this country adopt an axle basis. They did, however, continue their train mileage, on the theory that the wear of the rail was in proportion to the impact of the train, and that the heavier freight train was more than counterbalanced by the impact due to the speed of the passenger train. There was possibly some justification for that at the time that it was used. Then came the development of fast freights, of heavier freights, and the development, also, of the very heavy passenger trains, and it seemed to those who were dealing with this that the change in the method of traffic vitiated somewhat, or impaired somewhat, the application of this rule.

The old Interstate Commerce rule, and these various rules that have sprung up since that time and since the recent revival of this attempt to separate costs, I think, is responsible for all of these variations. Showing that the conditions of traffic are very much more complex than they used to be, and that the manifest errors, arising from those simple rules, have led the experts to endeavor to
925 make allowance for specific conditions. I can illustrate that best, I think, by Mr. Muller's statement with regard to ties. In that case, he puts 17.5% assigned to wear allocated on the basis of train weight, and 82.5% assigned to weather allocated on the basis of earnings; that is, the ties, as I understand his reason, are subject to two causes of deterioration, one being the wear and the other the weather, and he assigns 17.5% to wear and 82.5% to weather. That I understand to be the way they get at these minor distinctions and modifications of the rules.

The Woodlock method is set forth in his book, "Anatomy of the Railway Accounts." I don't remember whether he used train miles. I think his result on rails was the same as the post office method—$6,875 passenger; I don't know whether he used the same factors as that method. Muller, in Pittsburgh Coal Rate Case, divided rails one-half on locomotive miles, including switching, and half on car miles.

I have no opinion as to which of the nine methods most nearly approximates the truth. I have never formed an opinion as to the proper method of dividing rails, or any other item in the schedule, between passenger and freight. I have never been able to devise a proper or satisfactory method for any account. If they are all pernicious, I don't see how some of them could be better than others. I have testified that I think the system is wrong, or, at least, the conclusions erroneous, and I should not care to testify that some of them are absurd, as that calls upon my distinguishing between the methods.

The post office method has not been promulgated in the sense that it has been sanctioned by Congress. They have not used the method, except in the report of the Postmaster General to Congress, and it has been made the subject of considerable study by all
926 the railroads of the United States. It has never been applied to any practical question for the purpose of getting at results, and I understand that it is at present before Congress. By the use of that method, I assigned the highest amount to passenger—$6,875. The post office method varies very little from the method used in the Buhl Case by Commissioner Meyer. The Muller method gives the lowest to passenger—$3,992.

The post office and Woodlock methods assign 45% to passenger and 55% to freight, while the Muller method assigns 26% to passenger and 74% to freight. The difference between these two methods would be 19%, but I do not express it in that way. The percentages assigned to passenger by the different methods are: Post office and Woodlock, 45%, Drew, Nay, Worthington and Peabody, each 36%, and Muller, 26%. I have expressed the variation by a percentage of 72, and I expressed that difference in the words, "Difference between the highest and lowest assignments in percentage." The percentage of 72 was obtained by substracting the lowest assignment, $3,992, from the highest, $6,875, leaving $2,888, divided by $3,992 equals 72%; that is the difference between the highest and lowest in percentage, and the caption is accurate and truthful.

The 72% is the relation of the difference to the lowest, and the same result is varied if you take 45% minus 26% equals 19%, divided by 26% equals 72%. If you had divided the $2,888 by the highest, $6,875, the result would have been about 42%, but that is not the way that you find what the percentage of difference is. The 72% shows the variation in the result of the application of these rules. It shows that you must add to the lowest amount 72% of itself, in order to produce the highest, and therefore the difference between them is 72%.

927 I think I have saved the figures working out these accounts for the nine methods, but I don't know. It is true, so far as the affidavit is concerned, that it is impossible to check the correctness of my calculations resulting in these percentages without those figures.

My memory is that all these methods were taken from the statements of the men by whose names they are identified—taken from their testimony in cases, as reported. I will identify these methods, and give the sources from which the data was taken, and sources of details of the Nay, Worthington, Peabody, Chicago, St. Paul & Minneapolis, Hillman, Woodlock and Muller methods.

I can furnish at a subsequent time the working figures by which I obtained the percentages in the column of difference between the lowest and highest assignments, which are in my affidavit, and also a statement of the nine methods.

The method of giving the lowest amount for item 25, Steam Locomotives—Repairs, to passenger is the post office method; that method gave the highest amount to passenger in the division of rails, and the Muller method gave the highest for locomotive repairs and the lowest for rails, thus trading places. That is typical of the use of these figures by the various experts.

I would have to get the data from the books of the company to apply the Drew method for account 82, Fuel for Road Locomotives. I did not go to plaintiff's books to find out those factors. The percentages in this statement and my affidavit may have been arrived at by taking the South Shore figures; they were percentages that I find in the work of others. Of course, to be exact in amounts, that would have been incorrect. Mr. Muller worked on a coal carrying road, and his passenger assignments seem to be a small percentage of the total. In some instances, he was the low man, so far as
928 the passenger assignments on these six items of the South Shore primary account was concerned. Not having the South Shore data, I took the percentage which he ascertained in some other case.

It is readily conceded that, if the amounts were significant, that would not have been the proper method of procedure. Inasmuch, however, as I was merely illustrating a general situation, and by differences, it occurred to me that the exact amounts were not necessary for the conclusion we aimed to arrive at.

Q. But the same method for dividing the principal items in the maintenance account—take revenue train miles for example; applied in precisely the same manner, it would give widely different percentages on different roads, the traffic being different in its relation of the freight to the passenger; isn't that true?

A. That is certainly true.

Q. So that, for example, if you took the revenue train mileage basis for the purpose of apportioning the maintenance of way and structures common accounts between freight and passenger, on the Burlington road, in the vicinity of the coal mines in southern Illinois, where, over that particular division, we will say, there is ten times as many freight train miles performed as there are passenger

train miles, you would get a very low passenger allowance,—a ten per cent allowance on that figure,—wouldn't you?

A. It would be quite possible.

Q. But if you applied the very same rule to the very same problem on the New Haven road, or on another part of the Burlington, as, for example, between Chicago and Aurora, in Illinois, where there is, say, for the purposes of my point, ten times as many pas-
929 senger train miles performed as there are freight train miles, then you would get 90% of these items so divided to passenger, as against the 10% that you would get down on the coal mine divisions, in southern Illinois; that is true, is it not?

A. All of those results follow from those assumptions.

Q. Now as a matter of scientific investigation, in searching after the truth, would you not say that the application of the percentages ascertained by Muller's scheme, on a coal carrying road in West Virginia, would be unfair if applied on the South Shore in Michigan, if the relation of the passenger train traffic to the freight train traffic is different to that on the road in Virginia, where Muller worked?

A. All of which I was endeavoring to illustrate by what I put in my affidavit.

Q. Now, did you put anything in your affidavit to indicate that, in arriving at these percentages, you took percentages ascertained by investigators on other railroads, where conditions were probably different?

A. There is nothing there to indicate the percentages or the rules that were used, and all that you are saying seems to me to lie right alongside—reinforce—my point.

Q. That is, you say that if on one railroad in a given set of traffic conditions a method of dividing these common operating costs in the maintenance account produces a low per cent and on another road, where there are the reverse conditions, it produces a high per cent to freight or passenger, that tends to discredit the method?

A. Yes sir, it shows that the conditions are so various that you must have a method for every set of conditions, and that that opens
930 the way for arbitrary determination in particular cases, so that it is unsafe, as a general rule, to be followed in rate cases.

I said it was possible, in case of direct charges, that, in reaching affidavit percentages, we used the percentages ascertained by the application of the method to conditions of other roads, but I never conceded that we took the percentage of locomotive mileage in a coal road and applied it to a passenger road. In the affidavit computation, I made no use of train weights. I applied the methods, but, where we didn't have the data for a particular account, that was left unfilled. I desire to check the figures given as details of percentages of the affidavit, and see if they are correct.

If on seven of the nine methods the results were alike and one different, I think the argument in the affidavit table would be weakened, but that is not the fact. On account 4, which is but one of 115 accounts, four of the methods agreed at 36% to passenger,

two at 45%, and one at 26%. These facts are important in a search for the truth. I do not know why all the figures for each of the six accounts were not put in. I do not know why I took these six accounts, rather than others. My memory is that I took them as they came, picked them up here and there, because each one involved a different set of considerations; but it is merely illustrative of the variation. It would have been much better, doubtless, if the entire 115 had been spread on the record.

I do not know whether other items would show greater variation; I am sure, from general study, that others would show just as great variation. With regard to South Shore, I never made that test, but I know that is typical of a general variation in the various accounts.

It is very much greater than the average of the total, because
931 one set of figures would be higher and another lower, and in the total it is possible that they many to some extent counteract each other; but the purpose of the argument is to show the uncertainty of these arbitraries.

I selected the six items at random. The items selected are those which cover a common freight and passenger use. The wage items were not selected, as they are more largely subject to direct charges. I selected what seemed to me to illustrate the point that there were great variations in the different methods and that the divisions were open to question because of such enormous variations. The inclusion of account 82, showing a variation of 4%, shows that I did not select to show the most glaring instances possible.

My examination was made for the purpose of most strongly, by illustrating variations, supporting my long entertained contention that an attempt to make these divisions is futile, and worse than useless. The argument was presented in the strongest manner I could think of at the time.

Q. The direct charges method is that, in the case where you have charged some items directly to each of these departments and there are some items yet to be divided, you ascertain the relation of the passenger direct charges to the total direct charges and assign to the passenger such proportion of the items to be divided as the direct passenger charges is to the total direct charges; is that it?

A. That is correct.

Q. Can it ever be applied to any item so as to show the truth or the approximate truth, in your opinion?

A. In my opinion, it is very questionable, for the reason that it may lead to the division of the expenses of one class according to prinliples that dontrol the entirely different classes of expenses.

932 Q. By unrelated things?

A. Yes, you may use as the basis a ratio derived from a set of expenses that have nothing to do with the expenses you are assigning.

Q. Suppose you were dividing the cost of lubricants on a locomotive, and you had directly charged out the fuel and water, but hadn't kept account of the oil directly as furnished to each class of locomo-

tives; then the direct charges basis would have some relation to the problem?

A. It might have some relation to the problem, provided you knew from the record the relation of oil total to the total of coal.

Q. That would be a simple matter of keeping the record?

A. In that case, it might not be questionable.

Q. So, when you are considering these factors, it is well to consider the whole problem, and not pick out any one particular thing, and show that it is absurd as to that, and jump to the conclusion that it must therefore be absurd as to the rest, isn't it?

A. That is correct.

I shouldn't undertake to say that these rules that we have been considering, known as the Nay rule, the Drew rule, and others, are not more accurate in their results than just the bare application of the general principles.

I think, if the problem is that of the operating officers, that the locomotive mile can properly be used for some divisions of common expenses. No matter what the problem is, where you are trying to divide, between the two departments, certain items of cost, it can be used. I think the revenue train mile can also be used, if you
933 are bent on doing it. I cannot think of anything better for the division of the cost of maintaining fences along the road. I would not say it would produce right results.

The chief purpose of a right of way fence is to protect the train from trespassers, and to protect trespassers, whether live stock or persons and to distinguish railroad property from the other. If you are trying to get at the cost, I would say apportioning half the cost of repairing the fence to freight and half to passenger, where the number of trains is equal, would not be a proper basis. In a rate case, if you are endeavoring to base your argument for a reasonable rate on cost, that division would not be sufficiently accurate.

I can conveive of very many things that could damage that fence and call for repairs which might be wholly imputable to one service and not to the other; therefore, an assignment in proportion to train mileage would not give the proper results. Even if all the repairs were due to weather, I don't think a division on the train mileage basis reflects the exact truth. I do not see that weight and speed have anything to do with the wear of fences. I don't think there is any definite relation between the weather wear of the fence that causes a fence repair and the cost of running a freight train or a passenger train.

The cost of repairing an exclusive passenger platform would come under the head of direct charges; that would be accurate enough for rate purposes. In saying that that is sufficiently accurate for rate purposes, I mean the methods by which the figures are arrived at do not depend upon the exercise of arbitrary judgment on the part of the accountant.

934 The rate problem is insoluble along the lines of the analysis of cost. Whether the judgment of men familiar with conditions affecting the relative cost of freight or passenger business is a safe criterion depends upon what the judgment is for. The

practical man is obliged to go through this same line of analysis that the experts go through with, and, if they are not tenable for the experts, they cannot be tenable for him. I don't object to the exercise of personal judgment for certain purposes, but what I object to is the adoption of a rule which requires such an extensive use of arbitraries and personal judgment, which assumes that it is a demonstration, and accurate.

Even if you had the passenger expenses in Michigan correctly, it is not my opinion that the division of that between intrastate and interstate passenger in Michigan can be fairly and reasonably approximated. I think that division cannot be made with sufficient accuracy to justify the formation of an opinion as to the reasonableness of the interstate or intrastate rate; but you can proceed upon an entirely different analysis for a conclusion respecting the relative cost of the interstate and the intrastate. I don't think you can determine the relative cost of the two with any mathematical accuracy, but you can set boundaries beyond which it is not reasonable to say that it goes in either direction.

What I said in my affidavit was that 25% excess cost for intrastate business is too high; the 10% or 12% would be somewhere near right; it may be 5% or 6%, and it may be nothing. Confining yourself to that particular question, you can set a maximum and a minimum with, perhaps, a reasonable degree of certainty. That may also be so in the division of freight cost between intrastate and interstate, if the operating conditions are such that indicate
935 that there is a difference in cost. That is a matter of judgment of men familiar with it, who can get reasonably close to it. I have not set any figures; I simply put a maximum one way and the other, and I say that it seems to me, knowing what the courts have said in other cases, that the 25% is too high.

I have not consented to the proposition that, if we have the right amount of passenger expenses in Michigan on the South Shore, the relation of the cost of intrastate to interstate can be gotten at as a matter of judgment with reasonably close approximation.

Q. What I said was that you can get a maximum up beyond which you are very sure it does not go, and a minimum below which it won't go, and this maxima and minima, as you intended to express it in this affidavit, 25% was probably too high and 10% or 12% about right?

A. Yes, and there are 10 or 12 ratios between that you can have; your question implies that you can get at a ratio.

Q. You can get that close to it, anyway—from 15% to 25%?

A. Yes, where you have a range of 30% or 40%, I guess you can.

Q. You didn't have a range of 30% or 40% when you said 25% was high and 10% or 12% was about right, or something like that?

A. 25% high and 12% low; the difference is 108%.

You might estimate the freight within 30% or 40%, if you had the total freight expenses in Michigan. I don't know as you could get it as close in the freight as you can in the passenger.

Q. That there may be no misunderstanding, I want you to cal-

culate on the record that 30% or 40% spread that you say you had in the passenger business when you made your statement, in your affidavit, that I have read. I want you to work out that 30%
936 or 40%.

Tell us how to do it, and we will do it; tell us on the record.

A. 25% is your maximum and 12% is your minimum; the difference is 13%, and the variation of the per cent is that per cent which multiplied into 12 will give you 25, which is over 100%; so I withdraw 30% or 40%, and substitute 100%. The range of difference is 108-1/3%. That is the customary way of expressing ranges of per cent, when you wish to find out how much you must add to the lower figure in order to get the higher.

If you wish to proceed on the discount side, you would divide the 13 by 25, but I do not understand that is the way to express ranges of percentage. To subtract the 12 from the 25 and say the difference was 13 would indicate the difference in quantity; that is not a difference in relation.

ADAMS.

Redirect examination.

By Mr. Wykes:

In my criticism of plaintiff's figures, I do not think I have gone further than to show the uncertainty of the method followed by plaintiff in the presentation of this case. It has been my understanding that in rate cases it is the duty of the railroad company, in attacking a rate, to show the confiscation to be palpably and certainly the result of the rates, before they have made out a case. In a case involving confiscation, the method ought to be definite in all its items.

I did not engage in constructive work, in assigning costs between passenger and freight, because I do not believe in that, and do not think results which are reliable can be attained in the assignment of common costs of railway operating. I have, in connection with this case, declined to consider constructive work in the assignment of costs.

I was asked to do so, and I refused.

937 Q. In your criticism of so many arbitraries which rest in your judgment, is that criticism to any extent due to the fact that these arbitraries are dependent upon and have been reflected in different judgment, very widely varying, with no seeming common consensus of opinion upon them?

A. I have been impressed strongly that that was the fact in studying these varying methods.

The percentages expressed in my affidavit show the differences between the highest and lowest assignments that would result from the seven or nine methods which I applied on certain primary accounts. I don't know that the table in the affidavit presents the question more strongly than the figures would if applied to certain other items of the primary accounts. I have never attempted to prove that out, and didn't work out a number of items and then take the highest.

The fact that by different methods applied to a certain account the

same results are produced for a single item is no indication whatever that the results as applied to another of the 115 primary accounts would be the same, because of the fact that these methods may have been quite alike on account 4 and different on other accounts; there may be a variation, and that variation may be up or down.

For a particular item, one man's method would produce a high figure in one account and another's a low figure, and on another account those same methods would perhaps produce the reverse.

It seems very easy to devise rules to localize the expenses by states, and that has been done, and tentative rules for that have been published, but, when you add to that a separation of revenues by
938 states, so as to give to each state its proper proportion of net revenue from operations, it is found to be a very difficult question, largely because certain states have the terminals and other states don't have the terminals; the difficulty arises on account of the proper allocations of the terminal revenue and expense. It is the same class of questions that comes up in the allocation of expenses or revenues between branch lines and main lines, between feeders and trunk lines.

It is not necessary to arrive at the physical value in order to determine the commercial value. You can reach the commercial value by a capitalization of the net earnings at a proper rate. Definite and formal interest by the I. C. C. in the re-establishment of a rule of assignment of costs has been shown since Mr. Meyer of Wisconsin became a commissioner, about three year ago. The formal action on this point has been taken since he became statistician, after I severed my connection with the Commission, in June, 1911.

ADAMS.

Recross-examination.

By Mr. Butler:

It is my understanding of the rule in confiscation cases that the proof and methods of proof, as respects the ascertainment of costs, must be definite and accurate. My position is that there are no definite or accurate methods of ascertaining the cost of doing business covered by the rates complained of.

I do not think it is necessary to determine the cost of doing the passenger business on any road in order to determine confiscation. I think the total cost of all business, state and interstate, would have
939 to be determined. I am familiar with the decision of the Supreme Court to the contrary, and think that will have to be modified before we get any satisfactory adjustment of this problem.

I think a railroad properly administered might evade the necessity of having a rate case tried on the confiscation basis; it might do that by turning from the expense side of its accounts and statistics to the revenue side and service side and traffic side of accounts and statistics. That question opens up a whole question of public policy, and then asks whether the railroads are willing to take their side of

that work, and whether they will or will not, if they take that side of a public policy work and recognize frankly and freely that they are public agencies, be met by the public so that there can be some harmony of action.

I said several times that I do not think this method can arrive at sufficient certainty so that you can demonstrate confiscation or the absence of confiscation. I don't think any method that applies the rule of specific cost to specific service can do it.

Q. Can any method do it, at all? Is there any way to do it, and, if so, how, in your opinion?

A. I can possibly answer that to the extent that the question of confiscation is decided, or ought to be decided, when the total expenses are measured against the total revenue, and the relation of the total net revenues considered, and that net revenue considered in its relation to the value of the property. Now, if it is shown that there is no confiscation, then the question of the distribution of the burden that the public contributes—passenger and freight rates—to the company is a question of public policy, and not a question of private corporate management.

940 I do not distinguish between states or between intrastate and interstate revenue in my answer. I do not think there is any way to ascertain that with sufficient certainty or definiteness to meet the requirements of a confiscation case on intrastate net earnings, both freight and passenger, taken together, in any state, nor to meet the requirements of making a reasonable rate.

I think the ascertainment of the net earnings by totals for states is the easiest of all the questions of separation, and, if that were the only point to be considered, it is possible that one's judgment might approve a rule for the separation of expenses and revenues by state lines. My answer, in answering your theoretical question as to confiscation, was confined to the total revenues of the railroad as a unit, because, in that case, no question can arise as to what is the expense or what is the revenue. My idea is that they could make them haul certain classes of business for nothing, as long as the total on the system was sufficient, if there was a reason for justifying this, and that, also, discriminations between classes of traffic might be made, so long as the total revenue was all right and the discrimination reasonable in the judgment of the rate making body.

I declined to serve the State in the capacity of an expert employed to determine whether or not the intrastate rate was confiscatory. I accepted employment on criticizing the methods that were, or might be, adopted, for the purpose of showing that the case is not made out. My assistants, of whom there were six, reported to me that they were treated very courteously, in being given access to company records. I have no complaint that every facility was not offered us to ascertain the exact, specific, concrete facts in the case, the manner of keeping records, etc. I have given in testimony all that I desire in the way of criticism, and my criticism is not directed to the account-

941 ant of the South Shore, but to the general principle.

I think all the methods for the separation of costs are bad, and I should dislike to say that one is better than the others. From

the first, I declined to take up the question of whether the rates were confiscatory, and decided to confine myself entirely to the criticism made. The work done by Messrs. Friday, Heiss and others was not all done in aid of criticism. There were questions with regard to the localization of revenues and with regard to methods of apportionment, and to many other questions which were taken up. There was nothing constructive in my work, so far as determining whether that particular rate was or was not confiscatory, except so far as contained in this first affidavit. All of the work done under my direction was for the purpose of testing the work.

With regard to the item of wages of switch engineer and fireman, if observation shows they spent nine times as much time in the freight as in the passenger business, and the item divided 10% and 90%, that would be an arbitrary allocation upon the basis of time, the arbitrary being the assumption that the time reported is the time in one service and not in the other. I would be willing to call the wages of the engineer a direct expense, if it is on the basis of time. I would be willing to go that far; that is an arbitrary, upon the basis of time, which you could approve. The whole question of its propriety depends on the facts on which they rest. If the facts justify it, it is a good method. Whatever the facts justify is doubtless a good method; there is no denying that.

Walter J. Myers is the statistician of the L. C. C. and under the immediate direction of Commissioner Meyer, who initiated the move-
ment to make the division of operating expenses between pas-
942 senger and freight which commenced soon after he became a member of the Commission. Mr. Walter J. Meyers is obeying orders, in trying to find a basis for that division to recommend to Commissioner Meyer, so Meyer may recommend it to the Commission, so the Commission may make an order, if it sees fit. I believe it to be contrary to the fact that Walter J. Meyer believes in the assignment. I think he is obeying orders, but I think he has little confidence in the assignment of expenses between the passenger service and the freight service.

I have spent no time investigating the subject with a view to opposing the order; I have done nothing in connection therewith, and am not concerned in it in any way. I have had nothing to do with the I. C. C. since severing my connection with it, except to appear as a witness before the Commerce Court. I have nothing either for or against the policy advocated by Commissioner Meyer that in any way is addressed to the work that the Commission is now doing. I have considered the subject with other people, but it had nothing to do with the work that the Commission is undertaking.

My consideration was an investigation to make as clear a statement as I could showing why I believed the problem could not be solved. My work has absolutely nothing to do with what the I. C. C. is doing. I have done much work on the subject, and have been devoting a great deal of time to it. But that had nothing to do with the I. C. C., or the fact that the I. C. C. is investigating this subject; that is not the motive of my work. The question was not purely academic as far as

I am concerned, but I was employed to do it, though I would prefer not to state personal relations.

943 ADAMS.

Redirect examination.

By Mr. Wykes:

It is conceivable that a case of confiscation might be so extreme that you could leave out the part of the expenses that must be arbitrarily assigned and reach a conclusion that the rate was confiscatory. This might be so upon 20% of the expenses which admittedly can be assigned, or upon the 50% or thereabouts which it is claimed can be assigned.

ADAMS.

Redirect examination.

By Mr. Butler:

The case might be so extreme that a passenger rate might be shown to be confiscatory without any figures at all, but whether that is 2.5¢ or 3¢ a mile you cannot tell.

As to whether railroad men familiar with particular roads where conditions are similar might tell with accuracy whether there were any net earnings in that class of business, I think they can with sufficient accuracy to determine whether or not they wanted to go on with the business as a business proposition, but, when you come to apply that to a rate case and say whether or not to change the rate will be confiscation of property, I ask myself at once what property is used; you bring in all of those nine or ten sets of arbitraries; we have discussed here only one set of arbitraries.

An experienced railroad man, long in charge of property where operating conditions are similar, can form a judgment of much value in the operation of the property upon whether there is any profit in the passenger business, and reasonably accurate for the purpose of administering the property. Upon the question of whether there is a net return in passenger or freight depart-

944 ments above operating expenses, his judgment would be much better than that of an outsider. Of course, experience must necessarily help a man's judgment. I would prefer to trust his judgment to the judgment resulting from such a computation as implied by the application of this rule of specific cost to specific services.

Q. And you realize, do you not, that an expert employed to examine railroad accounts on a road with which he is not familiar, and has only the data recorded which is required to be recorded by the I. C. C. classification of accounts, other things being equal, is not in nearly so good a position to pass on these questions as the man who is in the accounting department of the road, keeping track of those things

from day to day and week to week, and year to year, and measurably controlling the expenses?

A. I think so, provided the man who is in that position would use his judgment as an operating or accounting man, and not apply to his figures some rule that has been worked out in some other case.

The matter of experting has, I think, resulted in these things and methods and arbitraries I have condemned as useless. I think they have been imposed upon the carriers, and especially the accounting officers, by the courts, and the accounting officers know that they are useless; I think the accounting officers of this country, if you will take a vote, would vote against them; that is my judgment.

Q. You think the accounting officers all know that these methods employed by these experts, is simply quackery, don't you?

A. Yes, and their own records, where they, themselves, are called upon to defend their own company in rate cases, they do this because they are requested to do it, and the request seems to come to them, or does come to them, from the decisions of the courts as
945 to what the courts want to decide the questions upon.

The revenue train mileage basis is used by many accountants to divide the principal common expenses in maintenance of way and structures between passenger and freight, and it is modified by a great many of them. A great many railroads use the direct account basis. Mr. Nay makes use of some of it; I cannot answer that he uses it in his office accounts. That, of course, is explainable in this way: There are two uses for this assignment—operating use, and a use in rate cases. I think it is perfectly proper for methods to be used which in and of themselves are not absolutely accurate if you wish to use them for comparative purposes.

My study leads me to say that, while the revenue train mileage is in very common use for the division of the principal items of maintenance of way and structures, it is frequently modified. The modifications I refer to were those used in rate cases, and not the rules they used for their own offices.

I cannot mention a company that uses any other than the revenue train mileage or its equivalent as a matter of routine on its books for separation of freight and passenger common expenses alter allowing such as they think can be allocated with accuracy, but the fact that I cannot mention it ought not to be accepted as a denial of the fact. I do not know the opposite of it, either. I have not studied this question from the point of view of the regular routine work of accountants in this country. They do not make those divisions between freight and passenger on their books. They make them in their office, and I have not studied the matter from that point of view. The consensus of opinion of all railroad accountants in this country would be valuable o nany subject of that kind.
946 I insist on making the distinction that these methods used by the accountants of railroads, and maintained for so many years, are for the purpose of operating officers, and for uses of comparison, and your questions are misleading when you ask me about the consensus of opinion. The consensus of opinion, when the purpose is one thing, ought to be confined to that purpose, and I do not

know, and I do not believe,—indeed, I believe the contrary to true,—that, if you get the consensus of opinion of the auditors of the railroads of the United States, it would be that this rule of specific cost for specific service, as applied to a rate case, is pernicious.

The propriety of dividing these expenses, or of any method, depends upon the purpose of the division. I should approve the use of certain rules, if confined to what operating officers need for statistical and divisional comparisons, but I disapprove, and I believe,—and, from what I know, it is my judgment,—that the accounting officers of railways in this country would agree with me. I disapprove the application of these rules in rate cases. I have talked with the railroad accounting officers on that subject for years.

ADAMS.

Redirect examination.

By Mr. Wykes:

(It is stipulated that the free right of way of plaintiff and its predecessors from the State and Federal Government equalled 130 miles—defendants claimed 147.60 miles, and plaintiff 112.32 miles. Of this, approximately 20 miles came to D. S. S. & A. from the Federal Government, under map of definite location, under Act of March 3, 1875; of the remaining 110 miles, approximately 75 miles came from State grants, the bulk being to D. M. & M., and 35 miles from the Federal grants, the bulk being to M. H. & O.
947 Defts.' Ex. 41, Adams, sets forth the land grants to the several companies named thereon, being plaintiff's predecessors.)

I have made investigation, to ascertain amounts received by plaintiff or its predecessors in ownership of line of right of way it now owns, or other companies which received the land grants through such predecessors; this is presented by my tabulation. My information regarding M. H. & O. is taken from reports of Michigan Railroad Commission.

By looking into the history of this matter as far as it is possible without going to the records of the company, it appears that in 1881 there was a sale of land grant lands for two and a half millions of dollars, and I should not care to go any farther than to say that, in my judgment, these figures show that at least $2,655,702 had been realize from those lands; but, certainly, the figures indicate that more than that has been realized, because there are other balances prior to the year when that large balance is recorded.

I have taken that from the printed copies of reports of the companies as printed by the Railroad Commission, using the years 1880-1881. In other years, I also found considerable amounts, apparently proceeds of sale of land grant lands; the largest amount is for 1873, when the cumulative balance is $158,503.34.

With regard to the D. M. & M. lands, I found a statement of the receipts and disbursements made by the trustees of the land grant

mortgage, February, 1879, to January, 1911. In this statement, the following appears (from Moody's Corporation Manual):

948 Receipts:

From contracts and deeds	$1,949,071
From timber sales, cash and bills receivable	2,036,335
Interest	439,572
Discount and premium on bonds	1,197,234
Mining leases	74,054
Land leases	1,760
Cancelled applications	7,515
	$5,704,541

Disbursements:

Land department	$834,247
Paid treasurer D. M. & M. R. R.	3,318,318
Tax titles	65
Taxes	278,591
Interest on land grant bonds	1,196,800
Bills receivable (Demand)	70,000
Cash in bank	6,520
	$5,704,541

To determine the amount of benefit received by the railroad, it must be observed that the total receipts are $5,704,541, of which $1,196,234 are credited as discounts and premiums on bonds purchased; to this extent, therefore, the total is not a cash receipt. This deduction shows that cash or its equivalent of $4,508,307 has been received from sales of land, timber, mine leases, etc.; to arrive at the benefit accruing to the railroad, there must be deducted the expense of the land department and taxes, which leaves as a net cash benefit to the road $3,395,469. The D. M. & M. benefited at least to that amount by these lands. This is in addition to the $2,555,702 to the M. H. & O.

(This witness was later called to testify before the Court.)

949 On November 25, 1913.

Prof. MORTIMER E. COOLEY, a witness called by plaintiff.

Direct examination.

By Mr. Butler:

I am, and have for ten years been, the Dean of the Engineering Department of the University of Michigan; have been connected with that university for 32 years. I am an engineer by profession.

I received my technical education at the United States Naval Acad-

emy, Annapolis, graduating in 1878. In 1881, I was detailed by the Navy Department to teach steam engineering and iron ship building at the University of Michigan. On my arrival, I was made Professor of Mechanical Engineering, and I have had that title and position ever since. My profession is mechanical engineering and allied branches.

I have had considerable experience in valuation work. I have devoted practically my entire time, outside of teaching, to valuation work since 1899, and have directed or had to do with, or caused to be made, physical valuations of public service and railroad properties. The aggregate value of the various kinds of public utility properties I have had to do with is about twelve hundred and fifty millions. Those properties are steam and electric railroads, electric light and power plants, gas plants, water power and water power electric plants, and water works.

In 1900, I had charge of the valuation of the physical properties of all the steam railroads of Michigan, and in 1902 I assisted the Government in Newfoundland in the valuation of the mechanical elements of its railroads. Subsequently, I was Consulting Engineer in the valuation of the Wisconsin railroads, and I had charge of the revaluation of Michigan railroads in 1903 and 1905.

950 I have, in a general way, kept myself informed of the progress of valuation practice to the present time; I have had something to do with it every year since 1900, and have from time to time engaged in discussions, prepared a few papers, and made a number of addresses, and lectured on the subject for the past five or six years.

Among the railroads valued in Michigan at the times I referred to was the D. S. S. & A. I became as familiar with its property as was possible in my position as director of the work.

The amount fixed as the total value of steam railroad properties in Michigan was: The so-called reproduction cost about $200,000,000; the so-called present value about 82% of that, or something more than $160,000,000.

There is now a well known engineering practice on the valuation of public utilities, especially steam railroads. I believe the general practice followed in Michigan in 1900 has been followed in other states where valuations have been made, with some variations. Prior to 1900, there had been no physical valuation of railroads on a large scale. The method adopted in the Michigan valuation was to discover the cost to reproduce the existing properties, with all new elements, then to discover the extent to which the elements actually in use had depreciated, and to affect the cost for new elements by this depreciation, and to determine what we call the present value of the physical elements.

The method followed by me in Michigan has since been known as the reproduction method. That method has generally been applied where physical values of steam railroads have been under-

951 taken. I think the engineering practice has in general become settled upon the principles that follow in those valuations. There has been considerable discussion of different methods,

but I think the majority of engineers have clung to the practice inaugurated in 1900, with some variation in details.

Since the Michigan appraisals, I have given no attention to the South Shore, except in a general way, and have not been engaged by plaintiff to do work or testify for it in this litigation, and have had no formal conference with its representatives. I have had, in a general way, some idea of the progress of the work as it has been going on.

In a general way, in the light of the development of the practice since the 1900 appraisal, that is substantially the right way to ascertain reproduction costs of railroad property,—the one which has been followed,—and only the matter of overhead charges has been more completely elaborated than was possible in 1900. It embraces other elements, and treats them in slightly different ways, e. g., contingency, instead of being put in as a lump item spread over the entire cost, is now divided into two parts, at least, and distributed, varying in amount for the different elements, being larger for some and smaller for others. I have been accustomed to divide it into (1) contingency of construction and (2) contingency of inventory.

The contingency of construction is rather a variable item upon different roads. It is illustrated by such things as sink holes, unknown conditions surrounding bridge foundations, etc. The contingency of inventory is intended to cover the omission of things in the schedule. There never has been a complete inventory, I suppose.

In the Michigan appraisal, the contingency item was expressed by a given percentage of the physical items and some of the over-
952 head items; it was there taken at 10%. I should — 10% was as near correct as any other percentage. I have never found that I could depart far from it in my own practice; I have in a few cases dropped a little below, and in other cases gone above. I think 10% would apply to a property like the South Shore. The only question which might properly arise concerning a 10% charge might be as to the items to which it is applied, whether to the entire valuation, including overhead costs, or that excluding the overhead costs. My recollection of the 1900 valuation is not entirely clear as to whether we applied contingencies to overhead costs; we did apply it to the physical schedule, including lands; we applied it in the same way to all the railroads of the State.

Since then, demands have been made by engineers to ascertain the appropriate percentage which should be charged to each item. We attempted to be more specific in the application in 1900, but could not make any investigation, because that valuation was completed in practically 90 days. The nature of the items or costs covered by contingencies do not permit of such analysis as to enable the appraiser to apply an appropriate percentage to each item of the schedule. If the engineer could satisfy himself in advance as to precisely the right element to all for contingencies, he would not need any contingency item. Broadly speaking, the item is to cover the unexpected things in construction and omissions in inventory. Because items are unexpected, and the omissions unknown, the items are called contingencies.

(Objection to reproduction cost theory as immaterial and irrelevant in this case; this objection to stand to all testimony as to reproduction cost.)

In the absence of specific information which might be matters of record, and which would enable us to eliminate, to some extent, the element of doubt, I should not want to make an estimate of
953 the cost of D. S. S. & A. or any other railroad, without allowing 10% for contingency item. I should not want to choose any other percentage in preference to the 10%, unless I had the very best of reasons to do it.

The fact that on some items, as ballast, contingencies were much less than 10%, or nothing, would not impair the general truth of the statement or my opinion that 10% of the total would be about right. As to contingency applied to equipment, the railroad could reduce its contingency item by contracting to have equipment delivered at a stated price. This would not reduce the contingency item to the builder, which goes in the cost of it. As the contingency item is in the cost to the railroad, it does not have to allow another 10%, but must allow something less.

I have known of instances where the actual cost came below the estimated cost—not as related to railroads, though, but to buildings; I don't think of any such thing in railroad values just at this time.

I don't think there is very much to the claim that conditions which bear upon contingencies are different in case of an existing property and property to be built, where the conditions are not so well known. If the record showing the actual construction cost is available when the valuation is made, then you have information to enable you to eliminate a part, at least, of the contingency item, but, without complete records for the existing property, I think it is more liable to be far more accurate to determine a probable contingency cost from original specifications and plans that it would from an inspection of the property existing.

This is mainly for the reason that conditions existing at the time of construction are described in plans and specifications, and you can make your estimates accordingly, but, when you see the
954 structure after it has been built for a time, there is, or may be, no knowledge of the conditions under which it was built. It is almost impracticable to make a good estimate of the cost of a building without first having plans made to get the proper estimate of quantities. I am of the opinion, after a good many years of thought on that particular point, that it is not only possible, but quite probable, that a more careful estimate of contingencies can be made, from plans and specifications, when the building is first built than after it is built.

I think that would apply to the valuation of the South Shore, unless the actual costs are matters of record, and are available. The lapse of time since making the record might affect the matter seriously, because the conditions under which the work was done originally and under which it would now be done might vary greatly.

At the time of construction of a railroad, the quantities and classes

of material may, during the period of construction, be definitely ascertained, but on appraisal, when records do not disclose quantities and classifications, it is not easy to ascertain correct quantities and make appropriate classifications, unless care is taken to make careful measurements from the actual structure.

It is more difficult to determine the proper estimates years after the structure was built, and then there are many things which have gotten into the structures since they were built that did not enter into the original cost, such as the sinking out of sight of ballast. Before the work is done, the natural surface of the ground at the center line is known; after the work has been done, unless profiles and records have been saved to disclose it, it cannot be ascertained with accuracy, unless you make careful survey again.

955 In the Michigan appraisal, I applied at least 10% to all the physical items. In my opinion, the amount of contingencies varies among the items, some items taking none and some more than 10%. The application of the 10% was to arrive at a sum which would be fair to cover the item, including both construction and inventory charges. The 10% was a contingency item to be applied to the property as a whole, and not to the individual items; it would not be right to say that I had valued a specific item at the amount placed upon it plus 10%. In the nature of things, the item of contingencies cannot be defined, nor can all the things properly covered by it be listed, either in advance or in the work of the appraiser.

Overhead charges are so called because they are not capable of listing in an inventory as physical quantities, and they are usually applied as percentages based upon the costs of physical elements. The percentages are arrived at by experience. These overhead charges should be arranged in chronological order, cumulating one overhead charge upon the other. The first is organization and preliminary expenses—those prior to actual work in the field, e. g., discussion of the propriety or advisability of building a public utility. Mr. Riggs' inclusion of organization and administration was in accordance with the Michigan appraisal methods, but it did not come as a preliminary expense.

Such an item as organization and administration is proper to include in a reproduction estimate of an existing property like the South Shore. The practice of the engineering profession on this is somewhat variable, due, mainly, to ignorance on the part of the investigator.

The percentage to cover organization and legal expenses is applied as a blanket percentage over the cost, without regard to its being a certain percentage on a particular item. It varies with the

956 different items, as does the contingency item, but the amount which is represented by, say 2.5% of the cost of construction, if properly distributed, would cover the various items of organization and legal expenses.

We have been rather uniform in the percentage applied for these items in Michigan. In the earlier Michigan appraisals, organiza-

tion and legal was 2% more recently, it has been 2.5%. I doubt if I could answer as to the proper rate for plaintiff, as organization and legal expenses vary greatly, from less than 2% to as high as 4% or 5% in specific instances. The 2% we used in 1900 was as low as could be used, it seems to me, and must, as were lots of other figures than those used, be very conservative. I could not assign a range of percentages within which South Shore would fall, as I have not had occasion to investigate steam railroad properties with a view to determine a percentage range. In my opinion, based on my experience, I should say such a percentage as we have been using in Michigan is very conservative. In stating 4% or 5%, I had in mind conditions in New York, or Manhattan, where preliminary organization and legal expenses were upwards of 4%.

The contingency item is not properly an overhead cost; it is a construction cost, and belongs in the body of the inventory. The organization expense percentage should be applied to the contingencies.

There is a percentage of profit going into the cost of construction which would be added to get the total cost of construction. This is the contractor's profit; it might appear as a percentage or an actual amount. It may be covered in the items, themselves, and usually is. In the Michigan appraisal, we endeavored, as far as possible, to include contractor's profit in unit cost.

957 Again basing my statement upon personal observation and knowledge, contractors have made up schedules, when required to do so, in a way which would enable them to reap additional benefits from the items which were almost certain to be called upon as extras; in other words, they have made up false schedules, putting increased values upon things which are likely to be called upon as extras, and shading them in other particulars. I am not justifying that, at all; I am merely stating it.

In my own experience in making estimates, I have determined the costs of materials and labor as nearly as I could, and then added my contingency, of 10%, usually, to cover the things which were likely to be omitted, and then added another 10% to cover contractor's profit, and then, judging by the character of the work, have added still something more for uncertainties, as, for instance, having in mind specific kinds of work, after I have made my most careful estimates, including these various percentages, I doubled the entire estimate, to determine what I thought would be the bid we were likely to receive. It has been justified in my own practice. I have in mind today a bit of railroad work, under construction, where the actual costs were estimated at 20¢ a cubic yard, which, I think, is abundant to cover the actual costs; several bids were at the rate of 65¢ a yard, and the contract was awarded at 40¢ a yard.

A fair allowance for contractor's profit, where not otherwise expressed, in estimating reproduction cost of a railroad like the South Shore would be not less than 10%. Contingencies and contractor's profit, whether expressed by percentage or considered a part of the cost of the physical property, are a part of the base to which the overhead charges should be applied.

958 I have usually endeavored to apply the engineering and superintendence cost on top of the actual cost of construction, before applying organization and legal expense percentages, as engineering and superintendence are more closely connected with actual construction.

Engineering: I had rental and preliminary expenses coming in there which might be included in organization and legal expenses, as we have been using the term, or might be included in engineering, but, in the Michigan appraisal, our engineering, as we used it, did not include the preliminary location of the line, but the engineering actually needed in the construction of the line in the location in which the railroad existed. We did not have to make those preliminary surveys; we found the line there.

We included nothing in the Michigan appraisal for preliminary surveys; that work was done, as we imagined the railroad to be reproduced in the same location. The conception of the item of engineering in reproduction problems is different from what it would be in ascertainment of original engineering cost, including location of the line, etc.

In the Michigan appraisal, nothing was allowed for reconnaissance necessary to locate the feasibleness of the route. We took the roads on our original assumption where we found them; all that work was done.

Q. In that respect, the engineering item would be less than the money which was necessarily expended in locating a route?

A. Yes. Of course, this should be said: This preliminary expense, if an item were included as preliminary expense in connection with the organization charge, that might include, also, engineering incurred during the preliminary investigation, but, if you were to include the preliminary expenses under the head of organization at 1.5%, I should be inclined to suspect it would be rather small.

959 Q. As compared with what it did cost in fact?

A. Yes, that would be my expectation; I really don't know, as a matter of fact.

In the 1900 appraisal, we were not influenced by the fact that it was made for taxation purposes, except during the first three or four weeks, when positive orders were issued to forget the purpose and proceed precisely as an engineer in making the estimate of the cost of a new property.

The overhead charges of the 1900 appraisal were used in the later State appraisals, with slight changes. The only changes that we made in the subsequent appraisals, as I recall it now, was to affect our unit costs by the prices which were current at the date of the appraisal—labor and materials, principally. We also took in the extension of the property, and the betterments. In the 1900 appraisal, prices on rails and many other items were taken for a ten-year period, being the average costs during a period of depression and a period of prosperity.

The conception of the Michigan appraisals was that the railroad route had been ascertained, and that the country was developed, as it was in fact developed. Specifically, nothing was added to cover work

necessary to locate the line at the time it was built, but only so far as such costs might properly be included in the 1.5% allowed for organization. I have no means of knowing, as a matter of fact, whether the allowances were sufficient for that, or not, but, in my judgment, I should consider the percentages that we did use for organization too small to cover those things. That is also true of engineering. It might cover them for specific roads, but I should say it was a conservative figure as we applied it.

960 I do not think the 1900 or subsequent Michigan estimates included in engineering or organization anything to cover surveys of highways and routes and their construction. The percentages were agreed upon as representing our best judgment as proper percentages for reconstruction cost.

The reconstruction cost of physical items may be higher or lower than the original cost; some schedules might be much higher and others much lower in original cost, depending on change of conditions, prices of services, etc. Our conception was reproduction, and our aim was to obtain reproduction cost at the time.

I do not think I know how feasible or practical the original conception of the property and the actual original costs would be for use at the present time. Engineers omitted hundreds and hundreds of things, in getting at reproduction cost, that are not a clearly reproduction cost, though they were incurred as a part of the original construction.

The allowance for engineering varies for the different items, the same as engineering varies. It may be as low as 1% or 2% on some, and as high as 15% on other, items. Our practice in Michigan has been in the neighborhood of 4%, all told, usually distributed, a part of it on the items in the inventory, varied according to the nature of the item, and another general engineering expense over all. We thought we were conservative in using 4%; that embraced items as low as 1% and as high as 10%. A percentage should be allowed for engineering on equipment. I do not recollect whether we were accustomed to make it 1%, 1.5% or 2%; I have gone as high as 2% on electric roads. I do not know whether there is an established engineering practice respecting the allowance of a percentage for engineering on equipment.

961 Another overhead charge is insurance for the property and for the men during construction. My recollection is that we have used 1%, and in some recent cases we increased it.

The next expense would be interest during construction and taxes. In this part of the country, we have been accustomed to assume that money could be borrowed at 6% per annum, and to use a rate of 6%, allowing for one-half the total amount, which would be equivalent to 3% on the total for the period of construction. In the Michigan appraisal, we assumed that any new work would be put into operation and begin to earn at the end of the year, so the interest item was 3%, but recently, because of the longer period of construction, greater amounts have been considered proper.

In reconstruction of South Shore 6% of the cost of construction for one-half the time would be the very minimum; the earnings

could not be very great if you did get it into operation. In putting into operation a part of a line, it would not be right to take it out of the interest-bearing quantity, unless there was a profit sufficient to pay the interest.

In my handling of this problem, I have conceived the interest charge to cover a certain definite period agreed upon as the proper period of construction, and, after the road is put into operation, there are certain losses which have to be incurred, in the majority of cases, until the property becomes self-supporting in every respect, and there is another element of cost which must come in, distinct and in addition to the others, but which was not included in any of the Michigan railroad appraisals.

I have not thought of a proper period for construction of the South Shore road in entirety. I have not been over the property re-
962 cently. I should say at least a couple of years—possibly three—would be required before the property, as a whole, would be completed and put into operation. Of course, parts of it could be constructed in a single season, and put into operation at the end of the season. I suppose winter weather in Upper Peninsula might have considerable effect.

I understand the almost universal practice to be to allow at the rate of 6% per annum on the full amount required to reproduce the property for one-half the time required to produce it.

Two distinct ideas of depreciation are found in every public utility property. One, a fixed depreciation, is that which, once obtained, may possibly be maintained indefinitely at, say 85%; you have lost 15%, due to the fact that the property can never be brought back to its condition new. This is frequently spoken of as depreciation, and is what I term fixed depreciation.

The second depreciation occurs from time to time and must be made good out of earnings to keep the property at a percentage of condition that renders it efficient. The fixed depreciation, for which I used 15% by way of illustration, cannot be replaced. To obtain the 85%, you must first spend 100% and then must maintain it in perpetuity.

The 85% was simply illustrative of a condition that would be efficient; 85% would be 100% efficiency; in certain classes of property, 80% might be 100% efficiency; in other classes of property, it might require 90% to be 100% efficiency. In the 1900 appraisal, we found about 82% for all the properties of the state.

Depending on the kind of property, there would be a condition of maintenance—say, 90%, 85%, 80%, or possibly less—at which efficiency would be equivalent to 100% of a brand new prop-
963 erty. I used 100% to represent the cost of reproducing the physical parts, and 85% to illustrate the condition of a railroad property in use, and assumed that the 85% of physical condition would be sufficient to keep the property in 100% efficiency; that is, as useful for purposes of transportation as if brand new.

You can never have a property operated in 100% condition; it is impossible to maintain it with all elements new, there being constantly replaced new elements to keep the 85%, and, from the prac-

tical standpoint of an operating structure, the condition of 85% realizes the maximum efficiency of which the property is capable, and, being the maximum, is 100% efficiency. We might go further, and say that with the passage of a few years, which brings the condition of the elements of the property to a stable condition, it is more efficient than if brand new. The stability of the railroad can only be had with years of use. This stability is in the solidity of banks, settling of ballast, and ties in the ballast, and all those things, which make the roadbed safe, efficient and keep it in alignment and surface.

We have been obliged to spend 100% to maintain the property at all; we can never have the 100% back, but we can keep in perpetuity some percentage less than 100, namely, 85%, 80% or 90%, as the case may be.

With cost of reproduction $10,000,000, instead of indicating average condition of 85%, or $8,500,000, in applying these figures in the ascertainment of the ultimate question of the fair present value of the road, it may be said to be worth at least what it would cost new, unless the 15% has been restored to the investors out of earnings.

(Objection that discussion upon the point is foreclosed by the decisions.) As an engineer, I should say that a road well maintained which will inventory 85% of its new condition is worth as
964 much for use to serve the public as the same road would be, or was, when brand new.

I could not answer as to whether it would be practical or possible, having due regard to economy, to maintain the South Shore at a higher percentage of condition than 85%. It would be impossible to maintain a railroad so that it would inventory 100% condition. The average for Michigan for 1900, including good and bad roads, was about 82%, some being higher and some less. I would say, when a road was maintained at or near 85%, it was pretty close to the point at which the best results, economically, might be expected.

Some elements of the property appreciate in value with lapse of time and maintenance, being particularly that part of the roadbed below the ties. I have never given study to the subject, or attempted to analyze any railroad property with a view to determining what the appreciation might be. While we considered the elements in the Michigan valuation, we made no figures or allowances. It is my opinion that appreciation should be taken into account in getting at the present value.

Assuming two properties with reproduction cost the same, one brand new and the other 10 years old, the present value column of the older would be greater than that of the newer road. Perhaps I have not selected a long enough period to make the statement literally correct, but the principle would be the same. The appreciation comes about in increased solidity of embankments and increased thickness of ballast, which is constantly put under the ties and distributed in the embankments, thereby enriching them, making them more stable, improving the drainage, increasing the safety, in greater solidity and increased permanency of roadbed, and

the case with which the grades and alignments are maintained, thereby reducing operating costs in the hauling power and the
965 maintenance expense. Such appreciation of an old roadbed with lapse of time is recognized as a substantial element of value by railroad engineers, generally.

The increment would depend very much on time. I should not expect the appreciation of a roadbed to offset the entire depreciation of the physical elements from 100% to 85%. Any figure I would give would be in the nature of a guess; it would vary with different roads; it would depend on the character of the soil in the roadbed, and of the earth upon which the embankments rest, the height of embankments, character of slopes, cuts, etc.

I could not say, precisely, how the element of appreciation could be measured or estimated. I think it necessary to make a study from an economic point of view, rather than from a purely engineering point of view, i. e., compare the roads from an operating standpoint, with a view to costs of hauling over them and expenditures for maintenance. It would undoubtedly be a combination of both economics and engineering. I have no doubt that, from a proper study of a specific property, an approximate estimate could be reached with some degree of certainty, if the problem were approached in the right way. Every property would stand on it own basis.

I have made no study, whatever, except in the most general way. I have seen neither the reports of Mr. Hansel or Mr. Riggs on South Shore, and have not heard anything about them, except in a most general way. All my answers have been based on my general information and knowledge of the subject. I have not accepted employment by this railroad to do any work in this case for it. I declined employment two years ago. I have been employed by the State of Michigan in connection with its several appraisals, and I consider my services at the disposal of the State prior to anyone else.

966 COOLEY.

Cross-examination.

By Mr. Wykes:

The cost of reproduction method was first used in the Michigan 1900 appraisal.

In the 1900 appraisal, we were given unlimited funds, and I was permitted to do whatever I thought best, the only requirement being that I produce results before the expiration of the year. I had free swing in the selection of the men and the salaries paid. I was employed Aug. 27, 1900, and the value of the railroad properties was in the hands of the Tax Commission prior to Jan. 1, 1901, though not in final form, as the closing of the field work, checking, continued later, and a second set of values was submitted the latter part of January. The actual work continued from Aug. 27 until some time the next June, before the final reports were obtained.

After the preparation of the tentative report, we went on and made such corrections or alterations as were necessary to prepare as complete a work as we could be June. The work, after January, was in the nature of checking; there was no change of policies, and no re-valuations or re-inspections, as I recall.

The present value, as reached through the cost of reproduction less depreciation method, is not of necessity the value of the property, either for taxation, sale or anything else; it is just value of the physical elements. Its value for any purpose depends upon the purpose that you are using it for. The physical value or present worth may be greater or it may be less than the actual value in a commercial sense.

There is one value to the purchaser in a commercial sense, i. e., the ability to pay dividends, and another value to the community served, independent of dividends. I am not so sure that the
967 present value through the cost of reproduction method is not of necessity the value for either of those purposes. I won't say that it is or is not. The thought comes to my mind that the cost less depreciation might measure the value to the community, and that the community could well afford to maintain the property at its present physical value, in order to be served, without any regard to dividends.

The value found in the method I applied is not of necessity the same value as the value to the community, or the commercial value, though it might be coincidence be the same as either.

The application of the cost of reproduction method involves the conception of the removal of the property; to work it out would in fact require the removal. You cannot work out the removal; you cannot put the railroad back in this specific place, because there is another railroad there; so, instead of working the problem, it involves the conception. It involves the conception of the production from private owners of property now belonging to the railroad company; it would be impossible to work out in practice, because the property is not now individually owned, but the right of way is in the unity in which we find it. It involves the conception of the application to the real estate, not of the prices that put it there, but of the judgment and conception of what would be proper today with added multipliers.

The question of multipliers has, I think, gotten beyond the conception period, and into the practical period, in that it was easy to ascertain the going value of adjacent or nearby lands by reference to the county records of sales, and, also, from the same source, to find actual prices paid by railroads for new right of way in the vicinity, and thus to establish a ratio between the going value of the land and the actual price to railroads.

968 The cost of reproduction method has come into quite general use since 1900. I know of no engineer who claims that the result is commercial value, and I have never heard it claimed by anyone, though it might by coincidence be the same. I understood from the question that commercial value meant sale value, and an ability to pay dividends, as distinguished from necessity.

In some of the elements, it cost less to put the South Shore there than the present cost of reproduction affected by depreciation. I am not prepared to say that it presumably cost less as a whole; I do not know. On rails, and certain elements, the road would cost more when built that today, and on certain other elements would cost more today than when built. Where the matter would land, I do not know. I think it would — difficult of ascertainment, unless you had access to the records.

The work of the 1900 appraisal was as carefully performed as it could be within the time given to it. We were unlimited in funds, and fortunate in getting men of experience. We endeavored to do the best possible job in the time at our disposal, and I think we did a good job.

In 1903, I was again called upon to value 28 different railroads in Michigan, very nearly all the railroad property, in value, in the state being represented in the suit. The valuation proceeded along the lines and the same methods as the 1900 valuation. I do not know any better plan than that. The 1902-1903 valuation comprehended bringing the 1900 valuation down to date. I had done valuation work in the meantime.

In the work of 1902 and 1903, we applied the same percentages as in 1900; we simply changed the unit costs, and introduced cash on hand and stores and supplies, as I recall. The same overhead
969 percentages were added, straight through. We did not add 10% for contractor's profit; we assumed our unit figures covered that.

From 1900 to 1905, I was engaged in valuation work. In 1905, I superintended another appraisal of certain Michigan railroads. That valuation was made in great haste, to determine whether the State Board of Assessors had assessed the railroad property high enough. The public believed the values of the railroads were not high enough, and the Attorney General was requested to produce information, and he proceeded to produce it, with the result that the assessed value was quite considerably increased.

This was on the basis of a report made by myself and supplemented by Prof. Adams. In the appraisal of 1905, we added the additions and betterments, and revised our unit prices to meet the prices of 1905; that is what we tried to do. We had difficulty in getting information at that time from the railroads; some of them declined to furnish it as to the extent of betterments and extensions, and we had to get the information the best way possible. In those instances, we took them from their reports to public authorities; also from our examinations in the field, to a limited extent.

From 1900 to 1905 was a period of raising prices. In 1907, we had a period of depression which was possibly reflected or anticipated in 1905. Our values went from $2,000,000, in 1900, to $235,000,000 or $240,000,000, in 1902-1903, and to $285,000,000 or $290,000,000 in 1905; that included new construction, new locomotives, etc. In each of these later appraisals, there was on honest effort on my part to reach the value of the railroads. I believe we used the same percentages for contingencies and overheads in all the Michigan State ap-

praisals, and we are still using them in approximately the same way we did then.

970 In recent work for the Railroad Commission, I think my overhead charges are a little larger, in aggregate, than in the State appraisals. We have re-distributed them, though, and we still omit discounts and the cost of procuring a going concern. We still include contractor's profit in unit prices, and include contingencies, engineering, insurance, interest during construction, working capital and stores and supplies.

I have not, in general, kept watch of prices, and do not know whether they have been increasing, except in the most general way. I understand the general tendency of prices is upward, but I do not know that of my own knowledge.

In the 1900 appraisal, the unit prices covered a period of 10 years, so as to have a period of depression as well as of good times. In 1902-1903, our instructions were to appraise as of April, 1902, and in April, 1905, we used the date of assessment. I am not so sure that that would be inconsistent with the assumption that it would take one to four years to reproduce the property, as the estimates of cost of construction would be made at some particular time, and at the prices then current, though certain articles might be advanced and others decline in price before actually purchased. On the three or four year period of construction, I would not assume letting the entire contract at any time, because it would be the matter of a number of contracts covering different elements that enter into it in addition to contracts for certain parts of right of way.

I do not, at the present time, see any other percentage than 10% that I would prefer for contingencies; there might be occasions where the percentage might be shaded, and others where it might have to be increased, but, generally speaking, 10% would be fair to cover

971 contingencies. I had the feeling later on in considering the 1900 appraisal that we might properly have used a greater percentage, owing to the haste with which the appraisal was made, but it was good enough for the purpose, and was a common percentage to apply, and we used it, as engineers ordinarily use 10%. It is possible that the contingencies might have been considerably less than the 10%, and it might have gone much above.

I do not know whether I wish to subscribe to the statement that if the estimates were high enough the contingency percentage would have disappeared altogether. You can conceive that the estimates might have been made high enough, but, if they were, the contingency percentage would have been included in one form or another, perhaps not as a separate percentage, but it would be a contingency item, whether it came in as a percentage or in some other way.

The contractor, in taking a certain amount of work, say grading on 10 or more miles of line, assumes contingencies in his price. In any part of the work, if there is contingencies, the contractor bears more or less of it. If the contractor has properly made his price, he has included in it those contingencies he must himself sustain, and also his profit. To the extent to which the inventory is perfected, the percentage of contingencies to cover that grows less.

The contingency of construction would cover the unforeseen things that would be encountered during the construction process, while the contingency of inventory would consist of omissions from the inventory of items. If you could make the inventory perfect enough, there would not be any contingencies of inventory. That would not, of necessity, remove the contingency of construction.

972 The contingency of construction might be a sink hole. If a special percentage were added for sink holes, etc., it might or might not care for that, depending on whether it was enough. In the case of a railroad built in part three times, they would probably have to add for that particular element of the road 300%, because it would have to be built over three times. Another common contingency is bridge foundations, whether quick sand or floods are encountered or not. Another is where a train rushes on to a bridge during erection and wrecks it.

I have enumerated no specific items of contingencies as being inevitably in connection with the property; however, contingencies of some sort would be inevitable in connection with every property; their amount would be contingent, and it might be 7% or 20%, or even 5% or 40%, on individual items.

Ordinarily, a better estimate of the cost can be made from the plans than from actual construction. The incidents I have just referred to are illustrative of the reverse of that, where the actual result is better than planned.

The contingency of injuries to employees is usually included under insurance. We have tried, in our valuations, to include it there. To refer to it in both places would be duplication.

To the best of my recollection, our organization, administration or engineering included nothing for the preliminary expenses described. I cannot be entirely certain at this time, and my recollection may be at fault.

In recent work, I have been dividing the contingency of construction and that of inventory about equally; that is, assuming a 5% construction contingency distributed among the several

973 items in various percentages and then adding an overhead contingency of 5%, which I have called inventory contingency. I have assumed them to be equal, ordinarily, and have always aimed to have them around 8% or 10%, altogether—ordinarily, 10%; they might run under or over that, and the percentage of allowance would be variable as to different roads and as to different localities. It would naturally be variable and depend a good deal upon the completeness of records, especially the inventory contingency. In saying hundreds and hundreds of items would be omitted from an inventory, I had in mind individual items, such as tools and things of that kind; there could not well be hundreds of classes of items.

The contingency item on real estate in the 1900 appraisal, in the light of the second and third appraisals, was far in excess of the 10% we added, owing to the lack of time and opportunity to investigate actually the cost of right of way to railroads.

The 1900 appraisal was made under great difficulties, so far as the obtaining of information was concerned—both difficulties in not

having access to records and difficulties of determining the character and value of the land through which the right of way was purchased. My belief, at the time the figures were submitted, was that we were far under the actual cost of right of way. On an appraisal today, assuming the railroads to be friendly to it, and the books correctly kept, and possibility to ascertain the costs under those circumstances, I should not care to add a 10% contingency to items which were matters of record.

Even when you have made the best computation possible, it seems to me that there is still justifiable a contingency on right of way. If we had an absolutely true inventory, then we would have no need of contingency. I maintain and insist that a true inventory is absolutely impracticable, except in theory.

974 There is a possibility of getting unit prices and arbitraries for land and overhead percentages too high, as well as too low. I would not say there was a probability of getting them too high, the overhead charges, particularly, as the knowledge of the average man investigating public utility property is insufficient to give him a correct opinion of what actually takes place in the construction; they haven't the knowledge and experience of things which enable them to form a judgment.

It is my belief, after many years of special investigation and study, that the average mind does not comprehend the actual expense incurred, both in the construction and in the overhead charges, particularly in the overhead charges. In saying the "average mind," I applied it to the man whose experience has not been special along these lines. To illustrate, a prominent engineer said to me, of overhead charges, "I dare not consent to their appearing as so and so, because the public won't believe me." By the average mind, I mean the average citizen, who has not had experience in these things, to whom the engineer makes his reports. His idea was that these percentages must be tempered with what will be accepted.

The overhead percentages are often and entirely estimates based upon experience with similar properties, and not matters of actual ascertainment. There is no way of checking them, absolutely, without carefully kept records of expense, as the property is actually built. There is no way of furnishing an absolute check as to what the conditions would be on the specific property, because the reproduction cost is an estimate. It is the same kind of an estimate that the engineer or contractor makes in connection with new plans; it is his judgment, based on his experience.

975 I am not a constructing engineer, in the sense of taking contracts and building things myself. In earlier days, I made plans, superintended actual engineering work, and had opportunity to ascertain the difference between estimated and actual costs of construction in certain kinds of work, particularly those relating to mechanical engineering.

In recent years, for public utilities property, I have worked for both the public and the corporations. I have had access to the books and records, and counseled with expert accountants and others in their analysis, and it has thrown upon my own experience a light

which was before impossible. None of the books contained a separation of the charges into the items I used in my appraisal. I have had opportunity to investigate costs, operating expenses and depreciation in electric street railways, where eight or ten groups were possible of separation, but not 30 or 40 groups, as in the Michigan appraisals. Not from my personal examination, but from examinations by public accountants, it has been possible to separate contingency or similar items so as to determine percentages.

On grading, I would expect contingencies to arise from lack of information regarding character of soil, e. g., estimates of earth actually found to be rock—an extreme illustration.

It is difficult for the contractor, in making estimates of cost in expectation of building, to say when he will encounter rock or hard pan; it is also difficult for the engineer, in going over a right of way for purpose of making an appraisal.

That contingency bears upon the classification and the arriving at greater or less quantities of higher priced material than is
976 actually there. The estimate of rock may under-run or over-run the actual quantities moved; the error of classification may go both ways, and the rock moved may be greater or less than provided for in the inventory.

Sink holes and other things which come in are frequently very likely to be serious when encountered. I do not know whether you would expect one or more on a long construction, or not, unless you are entirely familiar with the country; in that case, you might figure on them. I doubt whether I could mention any other than one specific instance; I remember that case, because it was nearby and notable. In Southern Michigan, I should say, sink holes are encountered quite generally, though I cannot instance another case. My impression is that the Grand Trunk had a similar trouble east of Lansing; the Michigan Central had similar trouble between Dexter and Jackson, years after the road was built.

Q. Are there any other contingencies that you desire to refer to or that you can refer to in the item of grading?

A. I haven't attempted to make up any lists of contingencies; I simply mentioned the things which occurred to me, offhand. I haven't given this any thought with a view to making up lists that would enable me to answer the question completely.

Q. You have no more in mind now with reference to the item of grading?

A. Not at this particular moment.

There would be less necessity for a large contingency item on ties than in other elements of construction. As I recall it, I think we omitted freight on ties in 1900, through oversight. I mention that as a thing liable to happen in making up an inventory. I
977 think anyone, even though having had great experience in inventory and appraisal work, will say that there never was a complete inventory, and that it always falls under, and never goes over, so far as the inventory schedule is concerned. I do not mean as far as the prices are concerned.

On ties, rails and track fastenings, contingencies would not be likely to occur in inventory, but might occur on prices, because of delivery, distribution, delay of material to arrive, etc. On ballast, contingencies could occur on that sinking out of sight; it might be estimated as 12 inches thick when it was in fact two feet.

I would not appraise as ballast that which had gone into the fills. The ballast going into the embankment to a greater depth than, say, 9 inches would be covered by contingency item. The actual quantities present would be treated and included at grading prices. The ballast over nine or twelve inches below the tie would not have been put there at ballast prices as fill, but would have been put there at fill prices, and would have been fill material, if it had not been for the conditions that forced it down there. This ballast should not be included in both contingencies and in amount added to cover solidification and incident items.

The ballast, generally speaking, put into the road after the first construction is a maintenance charge, and goes to operating expenses. This is renewal of ballast. The practice is to replace a portion of the road, continuously, every year, rather than the entire road.

Take 20 miles of road, ballasted six or seven years ago, with no general re-ballasting since, presumably, the time is approaching when there must be a general replacing of it, if it is to be kept to 85% of condition, or 100% of efficiency. There might or might not be a depreciation in the ballast, for the ballast that is
978 there might be just as good as ever, but it is replaced for the purpose of bringing the road into alignment, or correcting the grade, or something of that sort, more than because the ballast is worn out. When put there, there was no present necessity of putting other ballast there. A time arrives when more ballast must be put there, to keep the road to the percentage of operating efficiency desired.

Good management requires more ballast there, because the old ballast will not longer serve the purpose of good railroad operations. From the standpoint of efficient railroad operation, that ballast must be replaced or supplemented, and, therefore, has depreciated. Railroads do renew their ballast whenever necessary, and they do it to improve the conditions of operation. The ballast gets out of place; it can be, and is, replaced, by putting additional ballast on top. To use the same ballast, without adding new, you would have to remove the ballast and bring the earth fill up. The ballast itself has not depreciated, but has gotten out of place; it has depreciated by no longer being in the place where it ought to be to serve the railroad purpose as ballast.

The contingency which we might find in labor would be that you might have estimated that it cost so much, or took so much labor, to perform the work, and it did not take that much, or it took more. It is liable to go both ways, but, as a rule, it goes one way, as the contractor desires the work, and makes his bid as low as he can. If there is a contract at a certain price per mile for track laying and surfacing, the contingency goes on to the contractor; it is there, nevertheless, and the engineer makes the same mistake. Both the

contractor and the engineer, in figuring the unit price, take account of the elements of uncertainty; they would make them too small, rather than too large, but they may get them too large. They are far more likely to make them too small, because of the desire
979 of everybody to do the work, if it is possible to do it, and because of the realization that if the costs are too large the work won't be done at all.

Q. Is that susceptible of the conclusion that contractors ordinarily lose money on these jobs?

A. No, I don't think it is.

Q. And they don't ordinarily lose money?

A. I don't think they ordinarily lose money on these jobs.

Q. They ordinarily have the price high enough to get their profit?

A. They ordinarily have their price high enough to come out ahead of the game, but not necessarily to get the profit which they estimated. They may get more than the profit which they estimated. I have several cases in mind, very much more. And they often come out just even, and they occasionally come out in the hole. But the tendency, I think, without any question, is to under-estimate rather than to over-estimate.

The 4% for engineering in railroad appraisal work was adopted in 1900 as the result of a conference of chief and maintenance of way engineers and others who had spent their professional lives in railroad construction. They agreed upon that as fairly representative of the cost. I have taken the consensus of the opinion of the men associated with me, rather than making any computation from point to point to get the percentage.

For some steam railroad work, I have never attempted any detail work to verify the percentage, though I have verified it in other cases. The 4% is low, as compared with other work, e. g., architectural and mechanical engineering. The average construction work engaged in by a mechanical engineer may represent $50,000,
980 or $100,000. The labor and time required for plans and specifications for a small job is about as large as for a big one, and, proportioning this cost on a small job, it sometimes goes as high as 20%, but, if you increase the cost to, say, ten time- as much, it might fall to 2% or 3%. It depends, to a considerable extent, upon the amount of work.

This system would not apply to railroad work, as that embraces a large amount of territory where a mechanical job—e g., power plant—is in a single spot. There would be a variation due to the extent of the work even on a railroad. On two similar properties, the greater in extent and cost would bear the less rate of engineering.

It might easily result that a closer estimate could be made from plans and specifications than in inventory of a constructed property, where there were no plans and specifications. This applies to contingency of inventory, as well as of construction. It is possible for a more complete inventory with the constructed property, but I do not say it is probable. The possibility depends upon the completeness of the research. With plans and specifications showing in detail all the

things you are bound to incorporate in a building I believe it is more than possible to do a better piece of work in advance than after the work is done.

There is the possibility, if you were to obtain every bit of information, taking time and incurring expense,—but I am unable to say that it is at all more probable,—that you would reach a better inventory from the building actually constructed than from having plans and specifications before you. The more I have gone into it, the more confident I am that a better estimate can be made from
981 plans and specifications than from the structure itself. If you have the plans and the structure, I think you can reach a better inventory after construction than before.

Changes in almost all work take place, more or less, during the progress of the construction work, and would vary in estimate made from the original plans. In railroad construction work, the estimates are based on computations from profiles, and then they are changed more or less from actual measurements afterwards. There, the plans might not furnish any actual indication of what was done.

Whatever the added value of a railroad, by reason of adaptability, solidification, etc., would be in proportion to the period of operation up to a certain time, after which it might not change very much. I should expect it to go on in a moderate degree. I should say this would go on more rapidly in a railroad well maintained than in one not so well maintained.

The adaptation, etc., does not occur from operation alone, as an embankment without use would improve as years went by, though not maintained; e. g., it has grown to be more nearly like the original earth, and gets the qualities which come with that solidity that accumulates with the years regardless of any use of the surface.

The equipment today is perhaps twice or three times as heavy as it was 20 years ago. We are using locomotives at least three times the weight of those that were used in 1900, when the appraisal was made. The bridges have all had to be rebuilt, the rails have had to be renewed and increased in weight, and many things have taken place in the last few years in railroad traffic which seems to me might easily have disturbed the condition of the embankment over what might have taken place if the increase in weight of rolling stock had not come about.

982 I have never known of the appreciation due to adaptation and solidification being charged into capital; I think it is a condition of value which has come about without appearing in the books, except as an operating cost. In a greater or less degree, this goes on forever, except as it may be modified or affected by the heavier traffic now on railroads.

In stating, yesterday, that on certain items the engineering charge would amount to 15%, I referred to a railroad in which there is a power plant involved. I did not refer to South Shore. The shops, electric light plant, and things of that kind, on South Shore would have to be rather small to make propert a 4% engineering charge for the entire property. On some of the items, the engineering per cent might — 1%; I put that as a sort of minimum.

The engineering on equipment would run less than on something else. I do not know that it would be as low as 1%; it might run down to half what it would be on an average; I do not know where it would land. It would depend upon how much time was required in localities served by South Shore to determine the fitness of particular equipment. I do not think the percentage can be expressed as a particular item, talking at long range, as we are. I think the engineering percentage must be the best judgment of the man actually engaged in the work, and who found the percentage by experience. The same would be true of organization, legal expenses, and, in a measure, administration.

The theory of reproduction cost takes the value, today, of all elements,—land, labor and materials,—regardless of the cost. The contingency percentage would be figured, not upon the original cost to put the structure there, but upon the increased cost which represents the value of the elements today. The same thing is true of every overhead percentage. Assuming a multiple applied to lands,
983 that would be applied on today's prices, regardless of original cost. The reproduction theory disregards the history of the railroad, and takes the conditions as of the date when the valuation is made. The reproduction on South Shore might be more and might be less than the original cost. I would doubt its being less without a careful examination.

Assuming a structure having a 20-year life, and now carried at 50% condition, presumably, at the end of the 20 years it would be a matter of economy, and add to efficiency of operation, to renew, but it is quite possible to maintain the property in 50% condition indefinitely. I think 50% condition would be proper for a structure that would be replaced next year; it might be even higher. 50% does not necessarily indicate that half the normal life remains; it might easily result that a property maintained in 50% condition is producing earnings that would be equivalent to a property maintained in 85% condition; e. g., ties in a low condition permit the doing of business the same as if they were in 85% condition.

It seems to me that as long as the ties are used with reasonable safety they are entitled to have a value assigned to them, because they are performing the service of a more expensive tie. This, regardless of the fact that next year an expenditure must be provided out of operating expenses to replace them. As soon as that tie is in use to carry traffic, it has a value. It is a matter of record that the average condition of all the ties for all the railroads in Michigin for 1900 was 56%; that comprehends nomal replacements, and it is a matter of common engineering knowledge that, so far as railroad ties are concerned, they always exist at a value of between 50% and 60%.

If a particular group of ties stood at 35% condition, and it was possible to do business over them, they ought to be entered on the books as of 35% value. I am speaking of the physical life.
984 In a building, with a normal life of 20 years, that is within one year of having run its life, that structure should be carried as in 50% condition, as it is doing the work of a 100% structure, and, therefore, must have value. The 100% condition will carry,

without more investment, the work of the road that it performs for 20 years.

Q. The 50% condition, under the illustration, will carry it but one year, is the percentage correct?

A. There is where you have fallen down in your statement, or in your argument, or in your thought. The structure of 50% condition does not of necessity become valueless next year, because it can be maintained indefinitely in a 50% condition; it is question of whether it is expedient to continue that structure in the service of the company; it may be inexpedient; it may be altogether desirable, from an economical point of view, to replace it with a new structure. But you can maintain that structure in a 50% condition indefinitely. The structure has presumably become obsolete if it has to be replaced in the near future. Obsolescene is one element of depreciation.

Q. When you take depreciation coupled with obsolescence, that structure is carried at too high a percentage, if it is carried at 50%; that is true, is it not?

A. I won't fix any percentage as representing what it should be carried at. I am not contending for that. I am contending for the general principle that a structure can be carried at any desired percentage indefinitely.

In a structure of material which depreciates, you can constantly renew the worn out parts, which will always maintain it at some particular or desired percentage of effectiveness and efficiency. It may be maintained at a given percentage, and, as long as it is
985 so maintained, it can continue to perform the service for which designed. It may not be economy to do so; it may be far better, from a standpoint of economy, to wreck a car, save its scrap value, and put in a new car. There are plenty of examples of obsolescence making machinery in almost any percentage of condition valueless for continued service.

In making a valuation of a railroad, if a bridge were found in 50% physical condition, and it was known to be insufficient to carry the traffic, and known that it would be replaced next year, I would not consider that obsolescence, in putting on the percentage of condition, and would not reduce it below the 50% of physical condition that the inspection showed it had.

COOLEY.

Redirect examination.

By Mr. Butler:

It is the practice to include an item in cost of reproduction for working capital. This is usually arrived at by examining the books, to discover amounts necessary to carry on the business in the past. I recall no case w-ere we departed from the amount actually disclosed to have been necessary in conducting the business; it may be either more or less.

The history of the development and use of the property and the costs from time to time incurred is used as a guide to what is right

in reproduction items, especially for working capital and going concern cost. For promotion, administration cost and general expenses during construction, the history of the existing property and similar properties recently created, where fully and correctly recorded, is used by reproduction appraisers in reaching just conclusions and establishing right figures, particularly in the case of interest during construction.

986 Contingencies is to cover errors in estimates, deficiencies in unit prices, etc. The 10% in 1900 was found too small to cover such errors, omissions and deficiencies in allowances on lands, and subsequent experience indicated that 30% to 50% should have been added to that item. The land values were altogether too small in 1900. We did add 10%

There need be no contingency if a sufficient sum be estimated for each particular item, or if each particular item includes contingency, but I cannot seriously conceive of such a condition existing in any property. Land is an item where a contingency percentage over the whole item is necessary. It is more expedient to make use of a contingency item than to attempt to secure greater accuracy by prolonged investigation. I do not see how it would be possible, and do not think it practicable, to apply a contingency for each parcel of land. The uniform practice among reproduction value engineers is to apply a contingency to the land item. I have never known of an appraisal involving land where a contingency was not allowed, nor have I ever known of an estimate of any kind being made by a competent engineer where contingency was not allowed. I did not know that Mr. Hansel did not include a contingency for land.

Mr. Wykes: The novelty is that the Supreme Court of the United States has agreed with Mr. Hansel on that precise point since he made that schedule. (See 230 U. S. 455.)

Mr. Butler: The novelty about that is that Mr. Wykes is mistaken.

The Witness: And a still further novelty is that the Supreme Court, if it did that, is absolutely, utterly mistaken.

The uniform practice of reproduction engineers is to add contingency item to bridges, trestles and culverts.

987 Contingency item includes unforeseen conditions in performance of work, e. g., inability or difficulty to secure transportation of labor, strikes, weather conditions, etc. It is the uniform practice of reproduction engineers to add contingency percentage to item 6, Ties, and also to all items of construction. Items 7 to 15 inclusive of Hansel's appraisal all being elements of construction, an engineer would allow a contingency item on them, and I know of no reason why contingency should not be allowed on items 17, 18 and 19 of the appraisal.

The allowance of 10% contingency does not indicate that amount chargeable to the property in each item, but that it is a correct allowance for the whole, as there may be contingencies on some items and not on others. In recent application of contingency percentages, they have been applied in varying amounts to the different elements,

but, in the aggregate, they have approximated 10% of the total cost. The inventory contingency is usually applied as a blanket percentage at the end of the construction items. In recent years, I have endeavored to apply the most suitable contingency to the items making up the schedules, and afterwards the blanket percentage of the same to the whole.

Likewise, in engineering, in recent years, effort has been made to apply to the different elements of the schedule a proper, and afterwards a general, percentage. The aggregate would remain the same, but this is the much more logical application. Items 20 to 28 inclusive should each have a contingency applied to them; that is the uniform practice, as far as I know.

The practice is to allow contingency upon the equipment items, though not usually on the overhead items. In the 1900 appraisal, we applied it to everything. At first, it was the practice to apply the contingencies to the overhead items, but, lately, this con-
988 tingency is thought to be a part of the actual construction. The other overhead items are, today, usually applied to contingency and other items, except overhead.

Mr. Wykes: I wish at this time to call to the attention of counsel for the plaintiff certain things which I think it is their duty to prove in this case, and the duty of every railroad company to prove in cases of this character.

The defendants call upon the plaintiff to, and demand that it do, make proof of each of the following matters and things. The defendants hereupon agree that the plaintiff shall be given a reasonable period of time in which to make proof of said items and things, in case it shall announce upon the record its purpose and desire to comply with this request and demand, and make such proof.

(1) The fair value of the property used by the plaintiff for the public, other than and separate and independent from and in addition to the cost of reproduction affected by depreciation to represent present condition.

(2) The original cost of construction of the property used by plaintiff in serving the public.

(3) The amount expended in permanent improvement upon such property since acquisition.

(4) The amount and market value of its stock and bonds.

(5) The present, as compared with the original, cost of construction.

(6) The unearned increment, meaning thereby the increase in value due to causes other than earnings and other than investment of additional capital by the plaintiff in lands owned by it,
989 including the amount of such unearned increment accruing or added to the value of the property from year to year.

(7) The unearned increment in property other than land, due to increases in prices of labor or material, or otherwise, and the amount thereof accruing or added to the value of the property from year to year.

(8) The amount of right of way and station grounds donated or

granted free of cost by the Federal Government for right of way and station ground purposes.

(9) The amount of right of way and station grounds donated or granted free of cost by the State of Michigan for right of way and station ground purposes.

(10) The extent and amount of all land grants or donations of land other than for use for right of way purposes and as station grounds by the Federal Government as an aid to the construction of plaintiff's railroad, or any part thereof, whether such land was granted or conveyed to plaintiff directly or indirectly, or to or for or on account of any of its predecessors in ownership of the said line of railroad, or any part thereof, directly or indirectly.

(11) The extent and amount of all land grants or donations of land other than for use for right of way purposes and as station grounds by the State of Michigan as an aid to the construction of plaintiff's railroad, or any part thereof, whether such land was granted or conveyed to plaintiff directly or indirectly, or to or for or on account of any of its predecessors in ownership of the said line of railroad, or any part thereof, directly or indirectly.

990 (12) The proceeds from the sale of all land grants or donations by the Federal Government, whether received directly or indirectly, and when and how received.

(13) The proceeds from the sale of all land grants or donations by the State of Michigan, whether received directly or indirectly, and when and how received.

(14) The commercial value of the property used by plaintiff in serving the public.

Appreciation takes place by use and lapse of time, without regard to work or expenditure of money on the roadbed; the embankments, fills, etc., all become more solid, and more like the earth, originally, before it was disturbed. An old seasoned and appreciated roadbed would withstand the strains of faster trains better than a new roadbed. The increased weight of equipment, loads, speeds, etc., has required considerable change in the standard of construction of the roadbed and its structures, particularly in bridges, rails, etc., and more substantial ballast and things directly affected by heavy wheel loads.

The average speed per hour of freight trains is unbelievably low, because they need terminal facilities, better organization, and more actual energetic management. I believe the average railroad, today, which is not paying returns might very properly pay a very good return if it only heeded a few of the things which are so essential in other kinds of business—efficiency of operation. I am speaking generally; I don't know about the South Shore, and have not seen it in many years.

991 COOLEY.

Recross-examination.

By Mr. Wykes:

The reason for my answer that, assuming a bridge would be put out of office within a year, it would be right, in making reproduction estimate less depreciation, to carry that bridge at 50%, was this: All structures suffer depreciation. It is the common practice to figure the depreciation by the so-called straight line method as distinguished from the sinking fund method, it being simpler. A new property may depreciate steadily, we will say, from 100% to 50%, by the straight line method, and then the curve of depreciation maintained horizontal throughout the remaining years of its use, by applying such repairs to the elements of the structure as will keep it in a 50% condition; eventually, it has to be replaced, for economic reasons, we will say; when it is replaced, then the horizontal line at which it has been maintained for a number of years drops vertically to the scrap value.

I think, without any question whatever, that it is quite the proper thing to maintain the property at whatever percentage it may exist in and can be used in throughout the entire period of its use.

It is necessary to maintain a bridge at some percentage of condition above junk value, to use it and run trains over it. In my practice, I have insisted that all things in use must not be depreciated below a certain point, and they cannot suffer from further depreciation until they are wiped out of existence; this is applied to practically everything. In my understanding, the Master Car Builders' rules indicate that it is the opinion of car builders of the country that if a car be roadworthy and proper for use it must be maintained at, say, 40% whatever the per cent is. It is my idea that you must not go below a certain percentage, which represents a safe condition, until after the property is actually disposed of.

992 On December 31, 1913.

F. L. BATCHELDER, a witness called by plaintiff.

Direct examination.

By Mr. Eldredge:

I am Chief Engineer of the Copper Range. I am familiar with the topography of the country west, south and southeast of Houghton, and with the South Shore road, St. Ignace to Houghton, and especially in the vicinity of Houghton. In my judgment, the South Shore right of way, Chassell to Houghton, has a special adaptation for railroad purposes, chiefly from Pilgrim River west to Houghton. Pilgrim River to Houghton, the South Shore occupies the only logical location for a railroad, taking into consideration the cost of construction. Its

entrance to Houghton is on the most easily constructed of any possible entrance from the south, southwest, southeast or west.

West of Houghton, you run into Lake Superior, about 18 miles away. The Copper Range enters Houghton from the west and southwest, but its location cannot be compared, in cheapness of construction, with the South Shore; it is one of the heaviest pieces of work yet put in. It is mainly constructed, south of Houghton, through or on a range of hills, for the purpose of serving the copper mines existing or possible south of Houghton. They could have entered Houghton with lighter grade and less work from the east than on the location occupied; a survey was made in that direction.

The next most available line into Houghton and avoiding the right of way of the South Shore, Pilgrim River to Houghton, would lie on the lake side of the South Shore right of way, practically paralleling it. I have not located such a line by actual survey, but by close reconnaissance and by the use of existing topographical maps. An entering line could, and probably would, parallel the South Shore practically the entire distance from L'Anse to Houghton, but it would be a close parallel, Chassell to Houghton.

993 A crossing would probably have to be taken to bring the line to the Lake side between Chassell and Pilgrim River. This special adaptation for railroad purposes, Pilgrim River to Houghton Terminal, consists in the fact that it is the most cheaply constructed line possible between those points. The value of such special adaptation may be measured by the difference in cost of construction of the existing line and of the next most feasible line paralleling the South Shore between those points.

I have made an estimate of the cost of construction, exclusive of track material, which we consider equal, and exclusive of cost of right of way. This estimate is based on the possibility of passing in front of the South Shore terminal, and includes to the west line of the South Shore terminal lands. All the elements of adaptability of the South Shore road which I have given apply as far as the west line of the Houghton Terminal.

Estimated from profile, the quantity of earth between Pilgrim River and the west line of the Houghton terminal we find is 16,000 cubic yards of earth to be moved, which, at an average price of 30¢ per cubic yard, amounts to $4,800, to which should be added engineering and superintendence of about 5%, or $240, making a total of $5,040. On a line approximately parallel, passing outside any existing tracks of the South Shore between Pilgrim River and the west line of the Houghton terminal, we have 37,000 cubic yards of earth, at 30¢, or $11,100; 2,500 cubic yards of rip rap at $1, or $2,500; 2,100 lineal feet of pile trestle,—this estimated trestle was made from soundings and average conditions as I know them around the lake,—$25,275. A small plate girder draw span, to permit scows and tugs to reach a stone trestle of the South Shore, $12,000; 51,000 cubic yards of earth fill, to be made with steam shovel for replacing trestle of permanent construction, at 15¢, $7,650; 3,000 cubic yards of rip rap on same fill at $1.00, $3,000; 1 mechanical interlocking plant at crossing of line near Pilgrim River,

994 $2,000; total, $63,525; engineering and superintendence, 5%, $3,176.25; total, $66,701.25, or an excess cost of this line over the present South Shore line of $61,661.25. On my theory, the interlocking plant and the engineering percentage on it, $2,100, should be deducted, making the difference in cost $59,561.25.

The terminal lands of the South Shore at Houghton have a special adaptation for railroad purposes, which consists in the cheapness of construction of the yard. The South Shore terminal yard at this point occupies a piece of land of suitable area for yard purposes which could be, and was, adapted, in the state of nature to such use, due to the fact that it was practically a flat or very gradually sloping piece of land of suitable area between the foot of the bluff and the lake front. There is no piece of land between Pilgrim River and the west side of Houghton, until you are west of the Copper Range yard, which, in the state of nature, could be built into a yard with little expense. The larger portion of the Copper Range yard, which is west of the bridge across Portage Lake, was blasted out of solid rock, and the rock moved out to fill into the lake, and revetments were constructed along the harbor line, to retain the fill. This was the most available place for a yard by the Copper Range road, when it was built. It is impossible to state exactly the amount of yardage of earth moved to make the South Shore yard, but indications on the surface at present, from the depth of water in front, the average slope of the ground between those soundings, and the height given on the profile, show the surface of the ground at the center line of the main track at the time the road was built, and from the existing conditions along the shore, wherever a flat of this kind occurs, I state that 30,500 yards of earth work, at 30½¢ per cubic yard, or $9,150, plus 5% for engineering and superintendence, amounting to $457.50, or a total of $9,607.50, is a conservative estimate of the cost of grading that portion of the yard not already included in my main line estimate.

995 The next most adaptable land upon which a yard of equal value may be constructed and connect with the line, next most feasible to that of the South Shore, would be the strip lying on the north side of the Mineral Range track and extending from the west end of the South Shore terminal approximately to Portage St., in Houghton. From Complt.'s Ex. 16*a*, the length of the South Shore yard shows 1,568 feet. The length of this proposed yard would be approximately 2,000 ft.—narrower than the South Shore yard, yet approximately the same area.

To make this strip available for yard purposes, it would be necessary to fill in four different portions of the Lake front and build revetment to maintain the fill inside the harbor line. This filling would amount to 67,000 yards, at 30¢ a yard, or $20,100; 750 lineal feet of crib revetment at $50 per lineal foot, $37,500; total of $57,600, with engineering and superintendence of 5%, or a total of $60,480, from which we must deduct the estimated cost of grading in the South Shore yard, leaving $50,872.50 for the excess cost.

I did not have my proposed line cross the South Shore track and build my yard on the south side of the South Shore track and avoid

all this filling in the lake, because the natural condition of the ground surface over the parallel strip on the south side of the Mineral Range tracks is such that it would render the cost of construction higher than that on the site selected. There would be more earth work and the possibility of striking rock, enough to render the cost of construction greater; if a question of property values would enter there, that would also increase it. The property on the south side of the Mineral Range track is so built up and occupied by manufacturing plants and other buildings that the cost of acquiring the land there would undoubtedly be far higher than on the lake front, where there are a very few buildings.

From the natural conditions along the right of way of the South Shore, and along a possible paralleling line on the route described,

I can see no reason why the value of the property in the state
996 of nature along the proposed line should not be the same as along the South Shore right of way, as the conditions are practically the same. The South Shore line follows a side hill at a short distance above the lake, and in most cases the slope of their fill runs into the waters of the lake, and the parallel line would occupy a practically similar position—it would be either in the water of the lake with its slopes, or directly adjacent to the South Shore right of way, where it crossed already existing lands above the surface of the water. The damage to abutting property would be the same.

It is my judgment that the difference between the cost of construction of my proposed line and of the South Shore is the value of the special adaptation of the right of way of the South Shore between those points, and that the difference between the cost of creation of the yard on the South Shore terminal and upon my proposed new yard site represents the special value for railroad purposes of the South Shore terminal land, meaning the 1,550 feet of water front to which I have heretofore referred.

In giving the elements that make up the value of the special adaptation of these two parcels of land, I confined myself entirely to differences in the cost of construction. In determining generally in reference to land having special value by reason of adaptation for railroad purposes, it would, in my judgment, be proper to include a capitalization of the difference between the cost of operation of the property having special value and that of any other property which could be obtained to take its place. In case of a yard, it would be difficult to arrive at a definite conclusion; naturally, have to lay out the yard, and figure your switching movements, and comparison of the two yards, and then, from that, attempt to arrive at the additional cost.

997 BATCHELDER.

Cross-examination.

By Mr. Wykes:

Mr. Wykes: I move to strike out the entire testimony of the witness on the ground that strategy of position is not a proper element of value in a rate case; second, because the witness' conception of the method of fixing value of a railroad right of way is entirely improper and fanciful and conjectural and is based upon the conjecture of locating something alongside of this railroad, and in the third place on the ground that the entire testimony and the entire theory is immaterial.

I know of no other railroad seeking an entrance to Houghton, at present, from the east, and have not heard of any such for the last five years. The South Shore, the Mineral Range and Copper Range enter Houghton Village proper. Other railroads in the immediate vicinity have connection with those roads. The Copper Range forms a direct route to points south and west, by connection with the C. M. & St. P.

From the east terminal of the South Shore to Pilgrim River, there is practically no natural level land between the bluff and water, except small points that break out at intervals. The fill or stamp sand that constitutes the tailings from Isle Royal mill, is not natural formation. Today, there is less than half a mile in length along the lake where the level land extends an appreciable distance beyond the South Shore track toward the lake; the bulk of that is stamp sand from Isle Royal mill.

Between Pilgrim River and the east terminal, there are about four places that extend a hundred feet or over from the foot of the bluff out into the lake. Approximately three-quarters of a mile, total distance, it is a hundred feet or over. The imaginary line I have

998 located was entirely off the South Shore right of way, east of the Houghton terminal. There would be no advantage gained in locating it at places on the South Shore right of way, because where you are not in the water the ground is practically flat. At approximately three places, a total of one-half mile out of 2½ miles, the South Shore road is directly on the face of the bluff.

To make these fills, the material would have to come from the east, the most of it from the vicinity of the Isle Royal mill, about three-quarters of a mile west of Pilgrim River. The track would cross the place where you would get the material. The South Shore has a trestle outside the land portion of their yard, which has been used for various purposes, and it would be necessary, in building a track in front of the yard, to provide an opening to enable them to reach this trestle. If there was no South Shore there, you would be cutting off somebody's right of free access to the channel of Portage Lake, whoever owned the land. There is a draw span where the M. R. and

C. R. cross Portage Lake about 400 feet east of the South Shore yard west line.

The amount I have included for a pile trestle is intended for a pile trestle outside the yard and outside the present pile trestle of the South Shore opposite the Houghton terminal. I should have included the trestle that is there as a construction item in my estimate of what is there and have that as an item of deduction. Mr. Riggs' estimate would be fairer than anything I could give you on that trestle, not knowing the details of construction. The present trestle is about 700 feet long, and, owing to the location of the line, in order to avoid the South Shore right of way, it gives about 2,100 feet. The new trestle I have planned cannot be used for wharf space, as it would be only an ordinary railroad trestle, built for the carrying of traffic by this property, and into a suitable yard on the west.

999 About 12 years ago, the M. & N. road, which is now a part of the St. Paul system, projected a road into Houghton along that line, but they did not come in. The Copper Range was built about that time. I think at present the land surrounding the South Shore line, between Pilgrim River and the west yard limits, is held in large tracts, or subdivided and lots offered for sale. I do not know absolutely what the ownership along this strip is. I made no investigation. I would consider a strategic location is one that occupied a place where it was practically impossible to put another road by without great excessive cost, and I believe that strategic location to be worth the excess cost to construct a line over some other route.

(Government chart of Portage Lake marked Defts.' Ex. 42.)

I have never surveyed a railroad route in any direction into Houghton. I have in my office the record of all the surveys made by the Copper Range. I am familiar with the topography of that part of the country. It was not absolutely necessary for the C. R. to take the route it did; there was, before construction of the C. R., a line run easterly passing near the cemetery, shown on Defts.' Ex. 42—a 1% line, as I recall it.

BATCHELDER.

Redirect examination.

By Mr. Eldredge:

In building a substitute line, I don't see how you could use a portion of the ground occupied by tracks of an already existing line. If we did use a portion of that line, instead of building the pile trestle in front of the yard, it would cut the South Shore off from the water entirely, and from any use of the water front, except you provided an opening in the trestle.

1000 I read the testimony of Mr. Riggs in this case referring to a substitute line, and made a hurried examination of the same ground that was covered by his testimony. Assuming that a right of way in front of the property of the South Shore could not be obtained,

there is no more feasible route than that of Mr. Riggs. The Milwaukee & Northern road, in their proposed line into Houghton, took a route in the water substantially the same as mine, and to a point beyond the South Shore terminal, at which point they proposed to cross Portage Lake on another bridge. That survey was long after the South Shore had occupied this property. The surveys were made in 1892.

BATCHELDER.

Recross-examination.

By Mr. Wykes:

I have never been called to testify in a case of this kind before. I never heard of anyone who applied this method of valuation of a railroad right of way before. The first details of it came to me either through Mr. Riggs' testimony or through conversations with Mr. Eldredge. I have made estimates of this nature for construction purposes.

The substitute yard I have provided gets you up a short distance closer to the business part of the village of Houghton—about 6 blocks from the bridge crossing the river. The freight house and other facilities would have to be located at the east end of the yard, to have sufficient room for them outside the M. R. tracks. Your work tracks would be closer to the business portion, but your freight house and team tracks would not be materially nearer. There is no possibility of locating another track through the South Shore terminal on the water front, without interfering with existing tracks. There is a possibility of locating a line across the face of this cut, on the south side of it—the ground covered by Mr. Riggs, in his testimony. It
1001 could be located on the water front, and only cross freight tracks, but, if you were going to capitalize the cost of operation spoken of here a few minutes ago, you would have an enormous sum to add, to cover that; run one railroad yard through another and attempt to do your switching, and it would cost you a nice sum to cover that. It would practically ruin the other yards.

BATCHELDER.

Redirect examination.

By Mr. Eldredge:

I never had any consultation with Mr. Riggs about this matter; this investigation was done entirely by me. In locating work, the engineer always takes into account the relative cost of construction, as well as the cost of land, and the total cost of both is the controlling factor. An engineer must endeavor to strike the proper balance between the two that would give the cheapest road.

1002 On January 8, 1914.

HENRY R. HARRIS, a witness called by plaintiff.

Direct examination.

By Mr. Eldredge:

I am General Manager of the L. S. & I. and the M. M. & S. E. Ry. Companies. I know the trackage rights of the South Shore in Lake St. in Marquette, described in items 4 and 25, Marquette County, of Compit.'s Exhibits 1*b*, Riggs, and 1*c*, Riggs. The tracks are well situated for taking care of the business, and in a good location. The cash value of the right of the South Shore to occupy that stretch of land is about $30,000, in my judgment, based on the value of the land and what it would be, for the advantage a railroad would have, to have tracks located on the property. It would be worth that sum to my railroad. (Subject to objection as incompetent and irrelevant.) A railroad company could afford to pay that amount for the right to use the tracks there. The M. M. & S. E. could afford to pay, prescently, that price for those rights, which would be a value to it on account of furnishing facilities for obtaining business that we do not now possess. We have only a right of way in Lake St. for a single track road—a 13 or 14 foot right of way. We have no place to meet trains, in the whole width of Lake St. approximately three miles in length.

The track owned by the South Shore is between our own main track and the lake, so we have no opportunity to reach the shore line within the harbor limits, and it would give us additional earning power if we could have that space now occupied by the South Shore track, and it would aid us in handling our trains if we could have another track parallel to ours wherever required.

Our passenger and freight houses are north and east of Washington St. Our passenger location is bounded, south by Washington St. and east by Lake St., with a street between our passenger station and the track. Next to our main track is the South Shore, Lake St.,
1003 track. Beyond that is a space 150 feet wide, along Lake Superior. Part of that is on the same grade as the street, and part on the level of Lake Superior.

With the South Shore track out of there, we could have a yard of four or five parallel tracks, which it is now impossible for us to acquire. This track of the South Shore in Lake St., from Washington St. easterly, would form part of that yard; I consider that in fixing its value. In my judgment, that trackage right would be more useful to the South Shore than to our railroad. It is the inside track between the street and the harber limit. The fact that the 4,000 plus feet constitutes the main line of the South Shore from the east has a great bearing on it.

HARRIS.

Cross-examination.

By Mr. Wykes:

I included, in the value I fixed, that part of the trackage right occupied by the South Shore main line. If we had that, it would break the South Shore line in two. The L. S. & I. is west of the South Shore tracks, south of the Standard Oil dock. If we owned to the water there, we could make yards down there, by filling the bay. The South Shore track from Washington St. northeast is used as an interchange track with our road, and sometimes for storing cars. There are no industries located upon it.

Assuming this trackage right is merely an easement, and that the city can order the tracks off at any minute, I would give it the same value as I have, on the assumption that they won't order it off. In fixing this value, I took into consideration, to a certain extent, the value of the land that belongs to the city occupied by the track. If a person had the use of that land, it would, to all intents and
1004 purposes, be his property. I don't think there would be any difference between the use of that land and the use by a street railway of land in the streets of Marquette. I never valued a street railway, or thought of the valuation of these trackage rights in that connection.

The L. S. & I was built in 1896. From the beginning, accounts of cost have been kept, so it would be possible to ascertain the original cost of that railroad today from the books of the company. There is about 26 miles of main line and approximately 15 miles of branches. The road runs through practically the same kind of territory as the South Shore. The M. M. & S. E. was started in 1901 and put in operation in 1902. The original records of the company show original costs. The road has about 130 miles of main line. We are within three or four miles of the South Shore for seven or eight miles, then spread apart as high as 15 to 20 miles, and then come together again at Munising Jct.

The principal business of the L. S. & I. is ore. The rates are the same as those charged by the South Shore. Our passenger earnings in 1912 were about $5,000, total, about 1% of our ore revenue. About 10% of the business is freight other than ore, practically all of it coal from Marquette. I have investigated to see whether this ore business on the L. S. & I. is carried at a profit, and decided it was not at present rates.

The L. S. & I. is economically operated. I testified in the ore rate case in Chicago, and stated that, including all the railroads in the mining district, the entire trackage of sidetracks and branches to serve the mines and stock piles were moved on an average once in 15 years, and that some tracks were moved more frequently. I used that as an element indicating ore costs. That is a material ore cost. The track around the stock pile moves more frequently, which re-

quires special locomotive service to serve the stock pile and
1005 move cars about it. I refer to that as a cost of ore business that did not apply to freight generally. The L. S. & I. is now attempting to secure an increase in ore rates, due to my belief that, under present rates, there is no adequate profit. There was no net profit after payment of taxes in 1911—a low tonnage year. I could not recall 1910. I should say there was a small profit. There was a small profit in 1913.

I have no authority, without action of the Board of Directors of my companies, to purchase this Lake St. right of way, or agree on a price for it. I think the facilities of the L. S. & I. at North Marquette for ore dock purposes will answer its needs for a good many years.

HARRIS.

Redirect examination.

By Mr. Eldredge:

The South Shore is so constructed through Lake St. that there can be no use for street purposes of that part occupied by the South Shore, which differs from a street railroad. The use by the L. S. & I. and South Shore of the parts of Lake St. that they occupy is exclusive. The Munising road was started in 1895, and completed, as far as Little Lake, in 1897. It is about 70 miles long.

In my testimony in the ore rate case, I stated that the L. S. & I. was an unique railroad, built for the ore business, and not — be compared with any other road in the U. P., that it did a very small freight business, that its passenger business was inconsiderable, and that there was no possibility that its general freight and passenger business would be greatly increased. I said there ought to be charged to operating expenses a sum which, within the life of the mines which that company serves, would absorb the entire cost of the road.
1006 I believe we are in an entirely different position than the South Shore or the Northwestern roads. Our road showed a profit in 1897, 1902 and, I think, in 1907. In 1911, we did not show a profit, and in 1912, we did not show as much of a profit as in previous years. The only year that I remember right now where the amounts received for transportation were less than the expenses of operation, as per the I. C. C. classification, was 1911, which was a year of light tonnage. I think 1908 there was a loss, as we had light tonnage. In all the years except 1908 and 1911, we showed a profit above operating expenses, taxes and such depreciation as was charged. Our rates up to 1911 were 32¢ a ton, and after that 25¢. They are now 30¢. We have put in a 5¢ increase, and the question of its legality is at issue before the I. C. C.

I was called as a witness in the ore rate case to defend this increase in the rate, and I assume that, in addition to the ordinary depreciation charged by our company in its book of account, there should be taken in sums which, within periods of time that I gave, should amortize the entire cost of the property. I figured on branch tracks to mines being replaced in 15 years, and main line in 33 1/3

years, so that there should be added to the expense of the ordinary operation such a sum per annum as, amortized, would at the end of 33 1/3 years take up the entire cost of the road. All the figures I used in the ore rate case include the replacement of the property by the time the property was worn out. Included in the figures were actual costs, but the results arrived at were an argument.

HARRIS.

Recross-examination.

By Mr. Wykes:

The testimony I gave in the ore rate case was sworn testimony. It was my purpose to give the true state of facts, so far as I furnished figures not stated to be estimates. With the L. S. & I., in this
1007 peculiar situation, it must make the cost out of its ore business, and carry it at as much profit as it can reasonably get, and at as reasonable cost as is possible. Prior to Jan. 1, 1913, we charged no depreciation on our ore docks. The only depreciation in our reports to the State is depreciation on rails (for the past two years), equipment, and ore dock, since 1913. I should say the L. S. & I. road was as well adapted to carry ore business as any other railroad in the community.

HARRIS.

Redirect examination.

By Mr. Eldredge:

I do not think the State has ever issued positive instruction about the charge for depreciation. The I. C. C., in 1907, issued instructions that depreciation must be charged on equipment, but it left the rate to the railroad company.

1008 On January 27, 1914.

STEPHEN WOOD, a witness called by Plaintiff.

Direct examination.

By Mr. Eldredge:

I live in Marquette. I am, and have been, freight conductor 18 years; on South Shore, 10 years freight, and passenger some; I ran extra passenger about a year—within the last year. I am now local freight conductor between Marquette and Houghton, on Nos. 33 west and 34 east, one way each day, six days a week; the schedule time of 33 is 11 hours and 30 minutes, and of 34 is 11 hours and 25 minutes. I go on duty 30 minutes before leaving time; in that 30 minutes, I and my crew do braking, couple on the engine, couple up and adjust the air, while I, myself, take the numbers and seals

of the cars, and check them with the way bills. Trains 33 and 34 are local freights.

The duties of a local freight are to do all the station switching, load and unload package freight, deliver loaded and unloaded cars to connecting lines and industries, and pick up cars from transfer points and industries. In my judgment, about 50% of the time of my run, on an average, excluding coaling, taking water, and delays by meeting other trains, is devoted to station and transfer switching and loading and unloading freight.

WOOD.

Cross-examination.

By Mr. Wykes:

The passenger conductor also takes his train 30 minutes before taking it out. My compensation is on hours; we get paid by the miles if they exceed the hours.

Nestoria is the only coaling station between here and Houghton; that would take practically only 15 minutes to coal in. We make five stops for water from here (Marquette) to Houghton; sometimes we run by some of those tanks; as a general thing, in bad
1009 weather, we take water pretty nearly everywhere. At Negaunee or Ishpeming, Michigamme, Herman, L'Anse and Keweenaw Bay, we take coal and water right on the main line. Passenger trains generally take water twice between here and Houghton—at Michigamme and Keweenaw Bay; they don't take any coal, Marquette to Houghton.

I have never had a regular time freight run; I have made runs from Marquette to Thomaston—a few trips—on time freight; that freight would take coal at Nestoria and Ewen, and water at Negaunee, Champion or Michigamme, Vermilac, Trout Creek, Ewen and Lake Gogebic. I have had a passenger run from Marquette, through Thomaston to Duluth. That train would take no coal between those points, but would take water at Humboldt and Vermilac; it might take water four times, Marquette to Thomaston, depending on the engineer and weather conditions. I have been on all the passenger runs on the road.

No. 7 leaves Marquette 11.45 P. M. The switching for that train consists of a sleeper being taken off and another put on at Nestoria, consuming about 15 minutes; that is all the switching that is done.

No. 8, from Duluth toward Marquette, takes off and puts on a sleeping car at Nestoria, puts on a dining car at Marquette, and takes off a sleeper at Soo Jct. That is all the switching done.

There is no switching in connection with taking off the sleeper at Soo Jct; just got to stop, cut your car off over the switch and pull in; it is done by train crew. The dining car at Marquette is put in by switch engine. The change at Nestoria is made by the crew that runs from Nestoria to Calumet. There is no switching done at the Soo for No. 8. If we get into the Soo in time to turn the train and make connections, we turn it; if not, we go straight

to the depot, and it is turned by the switch engine; it would take them about 30 minutes to turn it and bring it back to Soo station.

1010 I have been on passenger runs, Marquette to Houghton and Calumet, and Marquette to Mackinaw.

No. 1, Marquette to Houghton, does no switching. No. 3, Marquette to Houghton, leaves with two coaches and a baggage and mail car, sets out the day coaches at Negaunee, and backs on to Northwestern train that they take out of Negaunee; then they set out a dining car at Summit.

No. 4, Houghton to Marquette, picks up the dining car at Summit, delivers the train, except the combination mail car, to the Northwestern, at Ishpeming, and couples on the two day coaches for Marquette that she brings up in the morning on No. 3; to set the diner in or out at Marquette, covering the full delay and getting the train under motion, takes about six minutes.

The cars turned over to the Northwestern on No. 4 include baggage, smoking car, chair, sleeping and dining cars, and at Ishpeming it takes an average of about 15 minutes; there is no switching on No. 2, and no switching at Marquette on No. 4. No. 4 goes back as No. 3; I have never noticed them turning it around; it goes out on the south track, and it is not necessary to turn it.

The passenger trains spoken about, running to Houghton, all go to Calumet, and lay up there; they are not at Houghton more than about 10 minutes, to transfer baggage, mail, etc., and discharge and load passengers, standing on the main track while there; no passenger train now lays up at Houghton. I do not know of any South Shore passenger trains that take sidings at Houghton, except possibly to pass other trains now.

Trains 43, Soo to Soo Jct., and 14, Soo Jct. to St. Ignace; on 43, no switching is done until you get to Soo Jct., when sleeping car off No. 8 is picked up, the train becoming 14. No switching is done between Soo Jct. and St. Ignace; at St. Ignace, no

1011 switching is done, except switch engine couples on to back end of train and shoves it onto the boat. It takes about 15 minutes to unload and get the baggage off at St. Ignace and to cut our engine off and shove the train out; that doesn't cover all the time to chain the train to the boat, at times; it depends on the weather; if weather conditions are bad, and sea heavy, it takes 25 to 30 minutes to chain the train down, because they take no chances.

Train 15 runs — St. Ignace to Soo Jct, and 44, Soo Jct. to Soo. The train is on practically one track on the boat; if there are no extra cars, the regular locomotive backs down, hooks on to it and pulls it to the depot. The only switching between St. Ignace and the Soo is laying out the sleeper at Soo Jct., to be taken by No. 7.

No switching is done at the Soo; you pull right down to the depot, cut your engine off, and that is all there is to be done; the train is taken to the wye and turned by the switch crew, and is ready to be taken out.

On No. 7, through to Marquette, the only switching is picking up the sleeper from No. 15 at Soo Jct. That is all of the switching

that is done by that train before it gets to Marquette; at Marquette, there is no switching, except to cut off the diner; sometimes this is done in lower yards; but it is generally cut off down at the passenger depot; you back in and leave the dining car right there; there is no switching done to it.

On No. 8, Marquette to Soo, there is no switching, except the exchange of sleeping cars at Soo Jct.

On No. 2, Marquette to Mackinaw, there is no switching done, except at Marquette; they gas the train, which is piped to the car, where it stands, in front of the station. It gets a Detroit sleeper at Soo Jct., and the switch engine puts it on the ferry in
1912 the same way we do No. 14.

No. 1, St. Ignace to Marquette, is on two tracks on the ferry. The road engine couples on to the train on one track; backs onto the balance of the train on the other. This train carries a sleeper, which is delivered to No. 18 at Soo Jct. Soo Jct. to Marquette, including getting out of Marquette going west, no switching is done, unless they have an extra car to set out.

No. 18 connects with No. 1, and runs from Soo Jct. to Soo; no switching is done, except it receives the sleeper at Soo Jct. It comes back as a mixed train, carrying baggage car and one coach to Soo Jct. As a mixed train, that has a combination baggage and smoking car and a first class coach, and an average of 12 to 15 freight cars; that runs without switching from Soo to Soo Jct.

On train 5, west and 6 east, Michigamme to Duluth, the only switching in Michigan is turning the train at Nestoria, done by the road engine, and consuming about 15 minutes.

I have been on the other local freight trains than 33 and 34; on some locals, considerably more than 50% of the time was consumed in switching, and on some less; it depends on weather conditions. I don't know as there are any much less than 50%; I fix that as an average for 33 and 34.

I have run on freight trains on all the divisions on South Shore; the business is heavier east of Marquette than west of Nestoria—quite a bit heavier. The freight business is lighter to Houghton than on the Western Division.

My last answers related to my experience on trains 33 and 34, and not to the general traffic of the Western Division, because I have not been running on it.

1013 Train 33 would leave Marquette at 7:30 A. M. No switching would be done there by the road crew, as the train is made up by switch engine, which puts the train in station order, the through cars and merchandise cars on the rear end, and cars for different stations in station order; that is all done at Marquette. The cars that make up that train were in different parts of the yard, and the switch engine assembles them and makes them into a train.

Q. About how long would it take to make up that train, assuming 17 cars?

Mr. Eldredge: If you don't know, say so; if you don't know, say so.

A. I have never worked in the yard, so I couldn't say how long it does take them to do it.

I have been around the yards; they get their cars in different parts of the yards. They have got a transfer up here that they get merchandise from; they have another place down in the yard where they get merchandise. Where they get their cars from different tracks, it would take one and one-half to two hours to get the train in shape. Some of those cars would be in the south yard, and some in the west yard; it is about a quarter of a mile from where they get those cars, at the passenger station, down to where they make up the train. Occasionally, they get a car out of the west yard, toward the shops. In arranging those cars in the train so as to get them in order, it takes the use of three or four tracks; those tracks are additional to those that the train has to use to go and get those cars and bring them to that point; they get them from different points and bring them in here and switch them.

Train 33, going west, would first stop at Eagle Mills to pick up cars for Houghton and Western Division, and local cars from
1014 Negaunee and Ishpeming; that would take you possibly 15 or 20 minutes to get them picked up in the condition you want them in the train; under normal conditions, you would get away from there in 20 minutes from the time you stopped. At Negaunee, you have to let a couple of passenger trains go by, if you get out of Eagle Mills ahead of them, which you would not do if you used 20 minutes to pick up those cars; if you consume 20 minutes at Eagle Mills, they would get by us there; we would have to get out of the way.

Assuming we met the passenger trains at Eagle Mills, we would go to Negaunee, set out cars there, if we had any, pull up and unload merchandise, take water, and pick up any cars to go west; that would take about 25 or 30 minutes.

At Ishpeming, the next station, we would pull in, set our cars for Ishpeming anywhere we can get rid of them for the switch engine; the engines work together there, the switch engine doing what she can.

We go through with those switching operations at nearly every station; some of the cars are full when we get them at Marquette; they come from different places; some are made up at Marquette—referring to merchandise cars. Some of them come from the east, from Mackinaw, across the Straits, some through the Soo, some from Marquette; of those we get at Ishpeming or Negaunee, some come from Chicago and south, and of those we get at Nestoria, some of them come from west of the state line.

WOOD.

Redirect examination.

By Mr. Eldredge:

In describing the switching of passenger trains, I referred to the normal or regular conditions, where the train ran without

1015 extra cars. On occasions, trains have to be switched more or less at important stations, for taking out of cars put in for a special service.

The tracks mentioned at Marquette, from which cars would be taken to make up a train (33), did not cover all the track from which cars might have to be switched for that train. The cars for the local freight come from different tracks; they might have cars from the D. S. & L. transferring, or from industrial tracks. I meant they got the freight cars from practically all the tracks at Marquette.

When I said I did not know all of the switching required or time required to make up my train, and get the cars into the train, that is true. I do not know, of my own knowledge, all of the switching required to assemble the cars in trains 33 and 34.

WOOD.

Recross-examination.

By Mr. Wykes:

I have talked with Mr. Eldredge in regard to my testimony in this case, Mr. Lytle, Mr. Houck and Mr. Tracy being present; other train conductors, Duroucher, Ryan, Wiseman and Hager, were present, and we talked over the conditions and things; we talked about the testimony we were going to give with Mr. Eldredge and Mr. Tracy, and nobody else.

Mr. Eldredge talked with me in the presence of these other trainmen, and talked with them in my presence.

1016 On January 27, 1914.

DIAS WISEMAN, a witness called by plaintiff.

Direct examination.

By Mr. Eldredge:

I am 37 years old, and reside in Marquette. I am, and have been, a freight conductor on South Shore nine years, and in service of South Shore 15 years. I have run extra and local freight, 33 and 34, for about a year, two years ago now; I now run 23, Soo Jct. to Marquette, and 24, Marquette to Soo Jct.; have been running these trains two years. Going east, the trip is made in 11 hours and 30 minutes, and west in 10 hours and 15 minutes; this is a local freight train. We report for duty 1.5 hours before leaving time at Soo Jct., and 30 minutes at Marquette.

At Soo Jct., we make up our train and do our switching, while at Marquette the switch engine does it. In my judgment, about 55% of the time consumed in my run is, on the average the year round, devoted to stational service or switching.

WISEMAN.

Cross-examination.

By Mr. Wykes:

My conclusion relates to trains 23 and 24. That switching and stational service involves loading, unloading, switching cars into and out of industries, and taking them over and giving them to connecting roads, both for carload and less than carload shipments.

Not a great deal of the freight we switch comes from other lines; some of the cars come from the Soo, some across the Straits, and some from Soo Line, at Trout Lake; some of the cars through the Soo are from across the river, but the biggest part are right from the Soo. In
the freight going from Marquette east, some comes up from
1017 Chicago, and some from west of the state line. On 24, I
should judge three-quarters of the freight would be carload lot stuff, and on 23 probably one-half.

Train 24 would have about 17 cars as far as Evelyn; then they double and handle 32 cars from Evelyn east; the hightest number of cars in that train would be 30 or 32. Out of Newberry, and those places. No. 23 generally has around 40 cars. The principal product out of Newberry is lumber and iron, that goes east, across the Straits. Out of Marquette, east, the freight is merchandise, flour, feed, lumber, etc.

When I stop at a station for switching, or to deliver or take on freight, I hand the station agent the bill, and see that the freight is unloaded; he checks off the bill, gives me way bills for freight he has to load, and I check it in the car; if I have carloads for him, I give him the bills, and if he has any for me, he gives me the bills.

The switching done by 23 and 24 may consist of setting cars for use at industries or at freight houses, and taking them away. We do not register, except at Soo Jct. and Marquette, and we don't need any train orders; we get them once in a while from the operator, who, in most cases, is the ticket agent. The operator is not the agent at Seney, Soo Jct. or Newberry, but the operator sells tickets at all of those places except Seney.

At Wetmore, I do business with the agent and operator, one being there at a time, and I do business with whichever one happens to be there; they both make out way bills and give me what train orders I have from that station. I would find them in the passenger station, and it is there I go to do the freight busines with them.

At Seney, the man who sells tickets does the freight busi-
1018 ness too, makes out the way bills, etc.; I find him in the com-
bined passenger and freight depot; I do business with him from trains 23 and 24 in the passenger station. At Newberry, I get orders from the operator, in the passenger station. He sells tickets most of the time; the agent has his office in the freight office there, and the operator in the passenger depot.

Up to two years ago, I was on trains 33 and 34; at Champion, I did business with the agent, who had charge of both the passenger and

freight depots; his office was in the freight depot. There were five employees there, the agent, two operators, cashier and freight house man. At Nestoria, the man I did business with was in the passenger depot, in 1912. The office at Champion is joint with C. M. & St. P., and these five employees represent both companies.

WISEMAN.

Redirect examination.

By Mr. Eldredge:

A merchandise car would also mean a car loaded full but consigned to different consignees, even though it was not to be delivered locally on my run, as well as a car with package freight.

WISEMAN.

Recross-examination.

By Mr. Wykes:

Wherever we find a passing track at a station, we use it, when necessary, to run our freight train in and get it out of the way so we can do our station switching. Passenger trains make no other use of those passing tracks than for purpose of passing some other train.

1019 On January 27, 1914.

JOHN HAGER, a witness called by plaintiff.

Direct examination.

By Mr. Eldredge:

I live in Marquette. I have been freight conductor on South Shore for 12 years; previously in employ of other railroads. I have run practically all the South Shore freight trains; am now, and have for three years been, running time freights 53 and 54, Marquette to Thomaston, and return. A time freight handles practically all through cars, and occasionally perishable package freight; that is classed, for compensation, as a second-class local, but carded as a time freight.

Our running time west, on actual schedule, is 12 hours, and east 12 hours and 5 minutes. Excluding time for coaling, watering, and delay in meeting other trains, 30% or better of our time, on an average, is devoted to stational or switching service at stations.

1020 On January 27, 1914.

MARTIN RYAN, a witness called by plaintiff.

Direct examination.

By Mr. Eldredge:

I live in Marquette. I have been a freight conductor on South Shore for seven years; I am now running time freights 21 and 22, between Marquette and St. Ignace, 151 miles. The schedule time on 22 is 12 hours and 15 minutes, and on 21 is 11 hours and 45 minutes. By time freight, I mean we handle no way freight, but through cars, principally.

We handle some loads and empties not destined to terminal points, picking up and dropping cars. Omitting time consumed in coaling, watering, and delays in meeting other trains, I figure an average of 25% of the time of these trains is devoted to stational work, including switching at terminals. About 1/3 of the freight carried in these trains would be local freight. I have, in recent years, run local freights 55-56, between Michigamme and Thomaston. Exclusive of time spent in watering, coaling, and delays in meeting other trains, in my judgment, 50% of the time of those trains is devoted to switching and other stational service.

RYAN.

Cross-examination.

By Mr. Wykes:

I was upon local freights 55 and 56 to about four and a half months ago. A local freight goes along, and does the station work, and handles package freight; such freight, east out of Marquette, would be cars to some station between here and St. Ignace, without regard to where they came from, originally, to get to Marquette. If it leaves Marquette, destined to some point east on South Shore, it is local, no matter where it originated. Trains 55 and 56 run between Michigamme and Thomaston, averaging 20 cars.

1021 For switching at the station, it may take 45 minutes to two hours; ordinarily, it will take over an hour at Soo Jct. It takes considerable time at Trout Lake, and at Newberry; it might be there 20 to 45 minutes. Still speaking of 21 and 22, we do no other switching between Newberry and Marquette; we may have a couple of cars to set out at Shingleton, taking 15 minutes; a few to take out at Wetmore, 20 minutes. Sometimes if we spend more than our time at a station, we cannot catch our time. We have a speed limit of 20 miles per hour, but sometimes we are delayed, and cannot make up time, on account of the weather.

To stop our train and take a siding, from the time the engineer applies his brakes, to be ready to stop, until we get into the clear,

will take between 15 and 20 minutes; you have to stop to get your switch open, and then start your train up again, and back in; I assume a train of 40 or 50 cars, which we sometimes have; it would take less time with a lighter train.

The average number of cars out of Marquette on 22 is about 20 cars; we pick up down at Evelyn, 45 miles east of Marquette, but do not do anything until we get there.

RYAN.

Recross-examination.

By Mr. Wykes:

On my last trip west, it took an hour to make Newberry, from Soo Jct.; that occurs frequently in cold, stormy weather. You can go right along with your train in summer, but a car standing on a siding in freezing weather is pretty well stiffened up, and it takes some time to get them warm; it takes more power to get it started—quite a while to get it under motion—when it is standing out, cold.

I don't know any place where the passenger trains stand out
1022 and get cold in that way.

The carrying capacity of trains varies with the different locomotives; our new engines have increased the carrying capacity of trains 60% over the standard engine—the 300 class. The tonnage figures I gave (R. p. 7431) applied to the new locomotives; before we got these new locomotives, the tonnage figures were 60% less.

I do not know the proportion- of freight in 21 and 22 that come into Michigan from other states, and that which originates in Michigan.

1023 On January 27, 1914.

JOSEPH DUROCHER, a witness called by plaintiff.

Direct examination.

By Mr. Eldredge:

I live in Marquette. I have been a freight conductor on South Shore 14 years; am now running time freights 31 and 32, Marquette to Houghton, 94 miles. A time freight handles only through freight, except in case of perishable stuff. Time freights handle carload freight only.

Schedule, Marquette to Houghton, is 9 hours, 15 minutes, return 8 hours, 30 minutes. On 31 and 32, taking average for year, excluding watering, coaling, and delays in meeting trains, about 30% of the time is devoted to setting out and picking up cars; that does not include starting and stopping the train. I figure from a dead stop to a start. Depending on conditions of grade, we would begin to stop the train ½ mile from station, and on good track it takes

about ½ mile to get up to normal road speed; it would take 10 minutes to start and stop, assuming 20 mile speed.

DUROCHER.

Cross-examination.

By Mr. Wykes:

It would take 10 minutes to run a mile, reducing, in the mile, from 20 miles an hour to a dead stop and start, and then reaching a speed of 20 miles an hour again. My 30% applied only to trains 31 and 32; that train would coal once at Nestoria, taking 20 or 25 minutes, and take water four times on the road, consuming five minutes, or 12 if you stop purposely; at some places, water can be taken in three minutes. In saying five minutes to take water, I figured three minutes to take the water and two minutes to stop, or maybe seven minutes in coming to tank and stopping.

On 31, we are allowed one hour and five minutes for working Ishpeming, and meeting trains there; that time is allotted to
1024 do work there, and meet trains. On 32, 35 minutes is allowed at Ishpeming; also 25 minutes at Nestoria; those are the only places shown.

Train 32 is allowed, on schedule, eight hours and thirty minutes for 94 miles, at 20 miles per hour; four hours and 42 minutes allowed in running; that speed is sometimes exceeded. There is almost four hours to get rid of on the way; if you come in on stational service, twice the percentage would not run 30%; that runs up so high only when you lose time.

Some of the cars on 31 and 32 come from Wisconsin; seldom a car on that line from east of Soo.

1025 On January 28, 1914.

CHARLES E. LYTLE, a witness called by plaintiff.

Direct examination.

By Mr. Butler:

I live in Marquette. I am General Superintendent of the D. S. S. & A. and Mineral Range railways. I am in charge of operation with headquarters at Marquette, and my jurisdiction extends over entire road. I have been *been* with South Shore over 25 years; 1888 to 1893, Chief Train Dispatcher; 1894 to 1900, Superintendent, since then, General Superintendent. While Superintendent, my territorial jurisdiction was the same as now. During these 25 years, I have been familiar with the operation of the freight and passenger trains on South Shore.

The classes of regular freight trains are: Local freight, or way trains, through or time freights, and extras; the extras run as requirement dictates, and are not on time card as regular trains.

Local freights do all the way work—the station switching and the distributing and picking up of less than carload merchandise, package freight.

Time freights do the through business, as a rule, distribute, load and unload considerable perishable freight.

To a considerable extent, when necessary, when they are not loaded with through freight, the time freights drop out and pick up cars at points intermediate the termini of the run. They lose their number at the end of the division, except two Western Division time freights, that hold their numbers into Marquette, for identification. But the scheme of handling the freight, or connection of the time freight, is continuous—it goes right through, from one end to the other.

1026 No local freight runs over more than one division, except two Western Division locals, running down to Michigamme, seven miles, to get them to a town where we can care for the engine; they do not do much work in there.

On Mackinaw division, we have regular local trains, Nos. 23 and 24, Marquette to Soo Junction; also 49-26, Soo to St. Ignace, and 48-25, St. Ignace to Soo.

So far as pay of trainmen is concerned, local freights are the highest class of freight trains; the locals all get the same rate. The crew on local freight, Mackinaw Division, consists of conductor, flagman and two brakemen, and engineer and fireman.

Trainmen and enginemen are paid 10 hours minimum; 2,600 miles a month is guaranteed them; that is 26 working days a month. Ten hours or less constitutes a day's pay. The local freight conductor is guaranteed $117.50, or 4.5¢ a mile. They are paid in miles, if miles makes the highest amount, and paid in time, allowing 10 miles to the hour, if that makes the highest.

All local freight conductors and brakemen get the same rate of pay. Some of our time freights are modified locals; they get the middle class of pay, and the time freight men get the lower rate. The local freight employees get higher pay, because they have more work to do, and more responsibility, as they have more detail work to do in distributing, picking up and loading freight.

A local freight man is on his feet practically all the time, and a time freight man, a good many times, has an opportunity to sit in the caboose and watch the train. Regular time freights on Mackinaw Division are 21 and 22, St. Ignace to Marquette; also 47 and 46, Soo to Soo Jct.; also mixed train 42, Soo Jct. to Soo.

1027 The local freight spends the most time in work at stations; excluding time necessary for taking water and coal, receiving orders and meeting other trains, about 50% of the time of 23 and 24 and about 55% of the time of 49-26 and 48-25 (all local) is spent by the train and crew at station work. Time freights 21 and 22 spend about 25% of their time in switching, and 46 and 47 about 20%.

My means of knowledge on this subject is personal observation. I spend more than half the time, as a rule, on the road, and have since being Superintendent and General Superintendent. There

is no absolute record, to show the amount of stational work and running time between stations; the train sheets show the time only at telegraph stations.

Many times the train is late, or a night train, and the operator, who informs the dispatcher where the train is, is not there. The train sheet always shows the departing and arriving time at telegraph stations; the sheet would not show absolutely whether the delay was due to waiting for a train or to switching work; you would have to have a knowledge of the schedule, to figure that out.

I control the making of the time card; the running time has been changed from time to time, to suit the business on the different trains. We change the time cards every spring and fall. We make no radical change on freight trains, as a rule, unless new business turns up, or we lose business. The business is quite different in winter than in summer. In winter we handle a great many logs and forest products, and in summer we handle a lot of iron ore.

The forest products and logs are switched, taken up and set out by local trains, a great deal, and there are extra trains that handle logs and forest products. The ore over the dock is handled by extra ore trains. The time freights east of Marquette are filled out with all rail ore, and, as a rule, it is handled on extra. The time
1028 freights handle the highest class freight first, and, if there is not enough of it, they are filled out with lower class freight; e. g. ore; if this extra capacity of time freight is not sufficient to handle the ore east of Marquette, they run an extra.

Of the time of No. 42 (mixed train), 20% is spent in stational work. The crews report before leaving time, and are paid for the extra time. There is also a time allowance, and pay after reaching destination.

A good many of the trains run into time in excess of the card time, being late; of this, the local train has considerable more than the time freight on all divisions.

The following table shows the pay of trainmen:

Trainmen.	Local.	Time.	Extra.	Local, second class.
Conductor	$117.70	$107.80	$107.80	$112.20
Brakemen	82.50	71.50	71.50	77.00
Flagmen	82.50	.....	.....	.....
Engineer (per day)	4.90 to $5.55	4.65 to $5.30	4.65 to $5.30	.....
Fireman (" ")	3.10 to $3.50	2.85 to $3.25	.....	.....

1029 On Houghton Division, local freights 33 and 34 run from Marquette to Houghton; 50% of their time, I should judge, is spent in station work, outside of time necessary for fuel, water, passing, and taking orders.

Local freights 55, Michigamme to Thomaston, and 56, Thomaston to Michigamme, spend 50% of their time in stational work.

Time freight 53, a continuation of train 21, on Mackinaw Division, changing crews and engines at Marquette, and running Marquette to Thomaston, and time freight 54, Thomaston to Marquette, spend about 30% of their time in stational work.

Time freights 31 and 32, Marquette to Houghton, spend about 30% of their time in station work.

On Western Division, time freight 63, continuation of 53, with new crew and engine, runs from Thomaston to Superior, and the corresponding train in opposite direction, 64, spend about 50% of their time in stational work (60% for train 63).

Local freights 67 and 68, Thomaston to Iron River, Wis., spend, respectively, 75% and 60% of their time in Michigan in stational work.

The time cards do not specify all points where freight trains are required to stop and do work of switching, picking up, dropping out, or receiving or delivering freight. There are many places on the line where such work is required of freight trains, where there are no stations or telegraph offices; these stations are, in the aggregate, sources of a large proportion of the business.

1030 The out tonnage at such stations is always larger than the in tonnage, where they are shipping forest products, but even the inbound train has to take empties to these same places; it means stop and work, distributing empties; it is a source of delay in switching, though there may be no tonnage to go.

Train 65 is a continuation of the run of 67, Bessemer Jct. to Bessemer, 1.9 miles; they lose 30 minutes going up there; they don't take their whole train up, on account of the grade; they have what is to go to Bessemer on the head end, cut the train in two, haul merchandise car to Bessemer, unload the merchandise, load any merchandise that is to go, come back down the grade, couple up their train, and pump up the air again.

The extras are always time freight, carload freight, and run as the service requires; if we annul a regular local today and run an extra in its place, the extra gets the local pay.

The extra and time freight do the switching incident to the train and trip; the local way freights not only do that, but also do the stational switching—all switching necessary at all of the stations where switch engines and crews are not regularly kept. Omitting the extra ore trains, about 25% of the time of extra trains and crews is spent in stational work.

The ore trains handle the coal for all the mines from which they get ore, and some commercial coal for Negaunee, Ishpeming and points beyond. The tracks on which iron ore originates and moves to Marquette are used in handling fuel, supplies and materials for the mines; the coal goes in, in the season of open navigation; the mining timber, lagging, and supplies of that kind, for the mines, as a rule go in in winter. There is a lot of mining timber shipped, and the inmovement to the mines and districts about them is the year round.

1031 Our railroad connects with other railroads at different points, as follows:

Place.	Railroad.
Sault Ste. Marie	Algoma Central & Hudson Bay. Canadian Pacific. Soo Line.
St. Ignace	Grand Rapids & Indiana. Michigan Central.
Trout Lake	Soo Line.
Shingleton	Manistique & Lake Superior.
Munising Jct.	Munising Railway.
Marquette	Marquette & Southeastern. Lake Superior & Ishpeming.
Negaunee	Chicago & Northwestern. Lake Superior & Ishpeming.
Ishpeming Republic Michigamme	Chicago & Northwestern.
Republic Champion Sidnaw	Chicago, Milwaukee & St. Paul.
Houghton	Copper Range. Mineral Range.
Chassell	Houghton, Chassell & Southeastern.
Keweenaw Bay	Mineral Range.
Other Points	A few logging railroads.

1032 (Objection to testimony immediately following, that the records show the information.) About 5/6 of the tons of freight handled in Michigan by South Shore comes to it, or is delivered by it, at these interchange stations. I am familiar with the physical situation and work required at these points to interchange cars, and in general with the number of cars customarily interchanged at these points.

At Soo, the in-going train pulls into Soo, and sets the train out into the receiving yard; then the terminal switch engine spilts the train up, separates and delivers whatever is local, and another engine takes whatever is through across the river. Most of the interchange business at Soo goes or comes across the river; a little business is interchange between ourselves and the Soo Line. We have a lot of business local to the Soo. The volume of interchange at Soo runs from 40 to 100 cars a day, in; the out business from across the river, in loaded cars, runs 10 to 20 cars a day, plus all the empties that went over loaded.

At St. Ignace, the road train comes in, puts the train on a receiving track, about a mile from the dock. The switch engine splits up the train, separates the local cars, which are later distributed, and takes the interchange through cars to the slip dock and puts them on the

transfer boat to go to Mackinaw City. The object is to keep the boat going, and the local cars are distributed, when they have opportunity, between times. They take the in-bound car off the transfer boat, and nearly all the merchandise goes to the house to be separated, re-arranged, and consolidated by stations and destination, and through cars are made up near the freight house, into out-going trains, by the switch engines.

We have local business to and from St. Ignace, but the interchange business there is very much larger; the interchange there is
1033 running 1,000 to 1,200 cars a week, now. It is a little higher now than in summer; the interchange business is always heavier during the season of closed navigation; the business is now light for winter. The ins will not run so heavy on loaded cars—about 25% of the out-bound interchange loaded. We are getting large quantities of empties now. There are about 250 in-bound loaded interchange cars a week; the empties will run about the same.

That is for winter. In open navigation, the loaded out-bound interchange will run about 70 cars a day and in-bound about 35. A great many of the in-bound loads at St. Ignace are consolidated by us and made into less loads. We take the in-bound freights from the Michigan Central and G. R. & I., coming to us in separate and mixed cars, and consolidate them into a great many less cars than they give us. Each company may give us half a carload of freight for St. Paul, and we consolidate all that St. Paul freight into one car, at our expense, with the transfer force at St. Ignace, and make one car out of the two. We have a foreman and a lot of men there, doing that all the time.

Trout Lake is Soo Line interchange. This, at present, I think, runs 25 to 30 cars a day received; this is light for this time of year, but the average for the year is less than that; we give Soo Line at Trout Lake 15 to 20 full carloads a day, average the year round. Four wye tracks connect South Shore and Soo Line there; as a rule, they set their loads on the east wye, for our east bound trains to pick up; we deliver to them on the west wye, so they can get them. That is ordinary business; if there happens to be a congestion, as there has been, caused by ice in the Straits and the boats being tied up, it very soon plugs up. We had everything chock full there a year ago—500 loaded cars set out that we couldn't take in because we couldn't get our boats to working. We aim to keep the Straits open the year around.

1034 At Shingleton, the interchange is not so heavy; we have two tracks there, both owned by this company, and we set the cars where Manistique and Lake Superior engines can get them, and they set cars on our tracks where we can get them, and when our train comes along we pick them up; this interchange is daily, averaging three or four cars a day, except when they are receiving iron ore at Manistique furnace, when it sometimes runs 20 to 30 cars a day of iron ore.

At Munising Jct., there is a wye from Munising main track to ours, with sidings off it, and everything interchanged there by both companies is set on that siding and we help ourselves. Our east-bound

trains can interchange there readily, but the west-bound trains go way down onto the Munising track to get at the lower end of that siding, and pick up their cars and set out. The in-bound and out-bound loaded movement at Munising Jct. would not exceed 24 cars a week; we give them a lot of Detroit merchandise, going to Munising.

At Evelyn, we interchange with Munising Railway; there is just a wye track. Seven or eight cars of logs a day, going to Newberry, are interchanged to us the year around; the movement the other way is nothing but empties. Evelyn business is all billed, and we regard it as Shingleton business.

At Marquette, we deliver to L. S. & I. on Lake St., and receive from them in the east yard. The interchange averages five cars of loaded tonnage a day out and one car in. Every time they ship a car of lumber, though, they have to get the empty from us to load it on.

At Ishpeming, the interchange business is heavy. There is a transfer platform there with C. & N. W. track on one side and ours on the other; they set everything for us on their side, and our train picks it up. We deliver to them on the same track; if they don't
1035 happen to have a train come along to clear the track, the switch engine does it. At night, the road trains help themselves, make their own deliveries and pick ups on the transfers, and in daytime the switch engine does quite a lot of it. The volume of interchange at Ishpeming would run 20 cars a day each way.

At Republic, the volume of business interchanged is small, hardly a car a day, there is a wye track from our line to C. M. & St. P. At Champion, our track parallels the St. Paul; everything we have for them we set on their track, and everything they have for us they set on our track; I don't think the volume averages over 10 cars a day each way.

At Michigamme, I don't think the interchange averages one car a day, but within the last six months quite a lot of telegraph poles, off our Western Division, were delivered to C. & N. W. there.

At Houghton, the average daily interchange with Mineral Range would run 15 to 20 cars west, and lighter the other way; about all we get there is refined copper, which is heavier in winter than in summer.

The other business will run 20 cars a day, in normal condition, off our line, and five cars to our line. At Houghton, the road train pulls in, sets the train out, a switching engine breaks up and distributes the train, and (except train 31) takes across the river whatever goes to Mineral Range; train 31 sets out its own cars at Houghton and takes Mineral Range cars over the river. To bring back the cars for the local freight, we get them at Houghton; for time freight 32, they get most of the Mineral Range cars at Hancock, across Portage Lake. At Houghton, the transfer with Copper Range averages about five cars a day.

1036 At Sidnaw, we now transfer about 25 cars a day; we deliver a great many logs at Sidnaw to C. M. & St. P., going to Oconto, Wis. We get down there with a train of logs, two engines, double header, and set the train over into the St. Paul yard; we

have to go a mile to their wye track and turn around, and go back with the empties, which they set over into our yard.

We have a short transfer track there, used to deliver one or two cars. If you have 24 cars of logs, it won't hold it, so you have to run that train through, into their yard, turn all the switches, and set it out into their receiving yard; they do the same with the empties; there is no track long enough to hold that many. The present volume is lighter there than in previous winters, except last winter. In addition to logs, there is a little interchange there of pulp wood and forest products.

At Chassell, interchange would not average over one car a day; the H. C. & S. set the stuff on our siding, and we pick it up, and we have nothing to give them except the empties.

At Keweenaw Bay, the interchange, principally forest products, averages, in winter, 25 to 30 cars a day; there is very little in summer. There is a track on which we deliver to them, and a long siding where they set our cars for us.

(Witness corrects the station switching on train 67.) I gave it as 75%; I think it will run 100% of the running time, and that the train does fully as much switching as running in Michigan.

On 67, the train will make her run in 45 minutes, but she won't do her work in Michigan in less than an hour and a half. That would be 100% of the schedule time, because the schedule time only represents the time the train is due to leave; it does not
1037 represent the time the crew goes on duty.

On train 47, time freight, I meant 20% of the total time on duty was used for stational work; and the same as to all other runs.

For business originating on our line in Michigan, the consignor orders a car from the nearest agent; the agent orders the car from the Train Despatcher, by wire, or, if it happens the daily car report goes in, he puts it on that, or he may do both. The train despatcher sends a car, and notifies him what it is for; the shipper loads and bills it, and delivers the shipping bill to the agent, if it is an agency station. When the train comes along, they stop and switch it into their train. If it is an agency station, the agent bills it. If it is not an agency station, the conductor lifts the bill, left by the shipper, issues a conductor's bill, and leaves the shipping bill with the first agent in the direction in which he is going, and the agent makes a regular bill, which goes with the conductor, or follows him to the final destination. That bill is called the freight way bill, and a copy goes to the auditor. If it goes to an agency station, the freight is to be collected at destination, and, if to a non-agency station, the freight has to be prepaid, or, if it is a regular customer, and credit issued, to the next agent beyond where the freight goes, where the way bill is filed, and collected weekly.

The locals mostly set out the empty cars for loading at point of shipment. The time freights set out some, but, as a rule, they set them out in bunches, and the locals spot them as they come along. The time freights do very little or no placing for loading, unless it

is perishable freight. Most of the picking up is done by the local freights, or extra trains out for that purpose.

In Marquette, we keep two switch engines at work days and one nights, in winter, and, in summer, from three to six, days, and two, nights. These switch engines spot the cars for loading, and
1038 pick them up and assemble them into trains after they have been loaded at stations where we have switch engines; switch engines are regularly kept in service for such work at Sault Ste. Marie, St. Ignace, Marquette, Negaunee, Ishpeming and Houghton.

Q. Describe the stational service at the point on your own lines where shipments are delivered to the consignees?

A. Well, a shipment comes in for a consignee; in the first place, he has to be notified that it is on hand, and that is done either by postal card or usually by telephone, if it is in a town of any size where they have telephone service; and he gives the disposition of it, where he wants to unload and when, and the car then has to be placed for him to unload. Of course, the expense bill has to be made out and taken from the way bill and any corrections used, it may be totally wrong or some clerical error that has to be looked after and seeing that the right rating is used and the expense bill written and corrected, if necessary, and if the consignee has a weekly credit, why, he gets his freight and settles once a week, and if he don't, he has to settle for it before he takes his freight, and then his car has to be placed for him to unload, and he unloads with a team, as a rule, if it is a carload, and then after it is unloaded there is another movement, to pick up the car and dispose of it. If it is an agency station he usually asks the train despatcher for the disposition of it. In case the same agent did not want to load it out again, which is not frequent, but even if *it* did, that generally has to have a move to get it out to some other point, at the point of origin, to load and if it is not wanted to load out then the train despatcher tells him where to send it to get a load, or, if no loads are in sight, if it happens to be a foreign car, to send home.

Carload freight is not accurately checked; less than carload freight is always accurately checked. Of the total tonnage, in Michigan, of all kinds of freight, I think about 4% is less than carload.

1039 Q. How is the less carload stuff received on your line in Michigan?

A. If it is at a freight station, the shipper brings it to the station, and the agent issues a receipt for it and takes it; he takes it and issues a receipt and checks it, and the train comes along and he has it on the platform and when the local comes along the local crew loads it into a car. If it is at a large station, such as Marquette, St. Ignace or Sault Ste. Marie, the station forces load.

Q. Is the car spotted at the house?

A. Spotted at the house and loaded by station order, and when they came to it on the local train in the morning, the freight for the first station is supposed to be next to the door, and so on, until the car is empty. Then the same crew will probably keep loading into that car at points beyond, as they came along, at the stations. If it is at the station where there is no agent, and they are flagged for less than

carload shipment, there has to be a shipping bill with it just like a carload. They stop and load it, and sign the duplicate way bill.

Q. How is the delivery at destination to or for the consignee, on your line, handled?

A. If it is at a large station, the car comes in, in the train, and the switching engine switches it to the house. The house hands unload the freight into the warehouse, and make out an expense bill from the regular way bill. They notify the consignee by postal card, generally by telephone if it is in quite a sized town, the freight is there and for them to call and get it. He sends his wagon, and, if he has a credit account, why, he settles his freight once a week, and if he don't, he pays for it before he gets the freight, and he loads
1040 it then into his wagon.

Q. Is this manner of delivery followed without regard to whether such shipments originate on your line or elsewhere?

A. The delivery is followed the same way; it is just as much trouble to deliver a foreign shipment as it is one of our own.

Q. And the same so far as loading, for a foreign shipment, as it is if loaded for a local shipment on your line in Michigan?

A. Yes. Now, in regard to delivering less than carload freight to non-agency stations, the train stops at the station, and if the consignee is on hand, there, to get his freight, it is unloaded and checked out to him, and he signs the way bill, acknowledging the safe receipt of it, and if he is not there, unless he has filed authority with us to unload his freight at his risk, then that conductor has to carry that freight to the next station and put it in the care of the agent, and the next day we have to tote it back and try to find the man to get him to sign up for it. We never found it safe to deliver less than carload freight at non-agency stations, without receipting for it; it always results in a clash, if we do.

The amount of service per ton at interchange points averages 25% of the single full stational service, where the shipment originates or terminates on our line.

Shipments originating and delivered to consignees on our line in Michigan receive two full stational services; shipments originating on our line in Michigan and delivered to other carriers at Michigan junction points receive 1.25 full stational services; freight originating on our line in Michigan and carried into Wisconsin receives but one terminal service in Michigan; freight originating on our line in Wisconsin and delivered to consignees on our line in Michigan receives one terminal service in Michigan; freight originating on our
1041 line in Wisconsin and delivered to other carriers at Michigan junction points receives 25% of a full terminal service in Michigan; freight received from other carriers at Michigan junction points, to be delivered to consignees at Michigan stations, receives 1.25 full stational services; freight received from, and delivered to, other carriers at Michigan junction points receives 50% of a full terminal; freight received from other carriers at Michigan junction points and carried into Wisconsin receives 25% of a full stational service in Michigan; freight received from other carriers at Wisconsin junction

points and delivered to consignees on our line at Michigan stations receives one full terminal service in Michigan: freight received from other carriers at Wisconsin junction points and delivered to other carriers at Michigan junction points receives 25% of a full stational service in Michigan.

The stational service at point of origin comprises about the same number of moves as stational service at point of delivery. I never was able to get any figures on the cost; it would cost about the same.

On carload shipments, the cost of originating on our line is about the same as cost of delivering to consignee on our line; on L. C. L. shipments, the time of originating a shipment is a little more than the cost of delivery. On carload shipments from other companies, we ordinarily take the originating line's weights.

Trains 28, 29, 35, 36, 37 and 38 are not time freights; 40% of their time is spent in stational work.

1042 LYTLE.

Cross-examination.

By Mr. Wykes:

On a carload shipment originating on Fiborn Quarry branch, our locomotives on trains 28 and 29 would do all that quarry branch work. Time freights do not go into the quarry; that would be a local freight, though the scale of time is the same as a time or extra freight. In estimating the time spent in stational work on the quarry train, I consider the time running into the Fiborn Quarry from main line as stational work; the 40% spent in switching includes the time in going into Fiborn Quarry. I think mileage made on Fiborn tracks enters into our revenue train mileage, but do not know.

A carload of freight originating on Peninsular Bark & Lumber spur would be brought by the Soo switch engine. A car originating on Bay Mills branch would be taken out to main line by No. 49's engine; that is a local freight. After it was on main line, the same engine would take it along, if going west; if going east, they set it out for local 48, to take in.

A car originating on Fuller branch is taken out to main line, 1.5 miles, by engine of local, 49; if it was going west, this train would take it along; if going east, they would set it out at Strong's, and 48 would take it along. On See Why branch, engine would take it out and bring it to Hulberts, where they would set it out for east bound, if going east.

A car originating on asylum branch, Newberry, is taken out by engine of local 23; if it is going west, they take it with them; if it is going east, they set it out for 24. On the branches so far mentioned we get nothing but carload shipments.

A shipment originating on Northern Cooperage Co. branch is delivered to us at McMillan, by L. S. I. & C. Co. At Danber
1043 branch, the L. S. I. & C. Co. run their engine on our track nine miles, Danber to McMillan; they pay no compensation

for use of our tracks. A shipment originating on Danber branch is delivered to our main line by L. S. I. & C. Co. engine.

All the branches in Marquette are served by our switch engine. Where a shipment originates on Negaunee and Palmer branch, the Negaunee switch engine goes after it. The Negaunee old mine is obsolete, though the tracks are still there (.80 miles). The old Mary Charlotte mine has been obsolete for two years; the track is still there, but not actively in use. Teal Lake branch is open; it runs to Lillie, Hartford and Cambria mines; we deliver coal to gas company on coal trestle there. This branch is serviced with the switch engine from Negaunee.

We have an active track to Lake Superior Pit No. 7; they ship ore. The Lake shaft branch (Lake Superior) has been obsolete three or four years. The Cleveland Lake branch is an active shipper. The tracks to the mines around Ishpeming and Negaunee are served by our switch engine.

The Winthrop branch, three or four miles out, is served by switch engine. The American Mine is served by local freights, going in to deliver merchandise, and handling ore shipments, by extra crews. Most of their steam shovel spotting is done by Ishpeming switch engine.

For commercial work, the Champion mine branch is served by local freights; the mine is not shipping; neither is the Webster mine.

From the L'Anse merchandise dock track, we get heavy shipments of telegraph poles. Local train 34 would go after a shipment originating on merchandise dock track at L'Anse; if it was going west, they would set it out on the track at the station for local
1044 33 to pick up; as a rule, the local going east would take it along, but as this is at the foot of the 3% grade and many times they cannot haul it, the time freight might take it. If it was a shipment out of L'Anse for Marquette, or a point east, the local would bring it to Marquette; from Marquette to St. Ignace, assuming that as its destination, it would probably be carried in time freight 22; it becomes a through car on the Mackinaw Division, and we are anxious to make time with it. The same operation would occur with a shipment from the mill track at L'Anse.

If a shipment originated on one of these tracks at L'Anse, to go on to Western Division, the local would take it to Nestoria; then, if going west of Thomaston, the time freight would get it; if going east of Thomaston, the local would get it.

On Baraga mill track, the engine of local 34 does most of the work. On Paquette mill track, the locomotive of local 55 would take the shipment coming out of that track, if going west, to Thomaston; if going east, they would set it out at Covington, for the east-bound local to haul into Nestoria, saving the time freight a stop there. If it was going to Marquette, it would go from Nestoria on time freight 32 or 54.

Shipments from Trout Creek Manufacturing Co. track would be taken out, and taken to the end of the division, at Nestoria, or Thomaston, by the local (56); at those points, they would be set out for time freights.

On the Weidman spur, they have their own engine; we do not

run in there. We haul them many logs on local, and get the business after the logs are sawed into lumber; we have to switch the lumber cars into their yard and then go after them; this is a stone's throw from the track. Our local train switches them out and carries the cars to Thomaston on west, or Nestoria on east, when they go into time freights.

1045 The locomotive of 56 goes into Basco branch and gets logs for Trout Creek; our engines, of extra logging train, run into Baltimore branch, six miles, for logs; this extra runs between Ewen and Sidnaw. Just now, that engine switches at Jensen Mills; they haul 15 or 20 cars a day of logs from Jensen Branch to Ewen, for Jensen mills. The products from Jensen Mills come to our track at Ewen and are picked up by the locals, time freights, and extra; that is right at the foot of a hard pull, and the tonnage out of there is not heavy; it depends upon what train can pick it up best. The locals, as a rule, cut down there, to get ready to do work east; you have to keep throwing extras in there, to get out the accumulated tonage.

The Bergland branch is served by locomotives of local 56, which goes in 2.8 miles to the end of branch. If shipment is for Bergland mill, it spots it there; we have to take it back about one-eighth of a mile and run in on the mill branch. The lumber from Bergland Mill is taken out by local 56; assuming it goes east of Marquette, the time freight would get it at Nestoria.

At Thomaston, there is no switch engine, and the trains coming in set out their train, and, as a rule, it goes through on the same class of trains, west or east; if it is east-bound freight, it all has to be made up into new trains. Coming east, the tonnage out of Thomaston is much heavier than that into it; i. e., an ordinary freight engine will haul 550 tons into Thomaston from the west, but from the east they can haul 800 tons; so it means doubling up, and takes more power to get that tonnage into Thomaston from the west than from the east.

A train from Wisconsin east, through Thomaston, ordinarily would be made up and changed in composition there: that involves a lot of switching. The short cars are set out for the local, and if there are through cars, the time freight gets them, even if

1046 they only haul them to Ewen, 32 miles, at the foot of another hard pull. They always cut down at Ewen, if they come in with full loads; the tonnage into Ewen is 800, and out 550.

Nestoria is the end of a division, but all the Western Division engines come down to Michigamme, seven miles, to get to a town where the men can be cared for, and where there is an enginehouse. I do not know whether the mileage, Nestoria to Michigamme, so made, enters into our train mileage. If there is anything to go to Michigamme, they haul it.

At L'Anse, we keep one pusher locomotive. We do nothing with the other stalls in the enginehouse there; we don't use them for storage, as there is nothing to store.

Marquette is a division point, where every freight train is broken up and rearranged. Nearly every train from the west has some

cars to take out for Marquette. Every train is subject to inspection, and some cars must be switched out for repairs; eastbound, we haul more tonnage, as a rule, except the way trains from the west; westbound, they cannot haul the tonnage out that they can bring in from the east; a train must be cut into five or six trains, to get it out of here, going west, and a lot of tonnage originates here.

The east-bound trains are arranged here, and Soo and St. Ignace loads put by themselves; it is seldom unless you are running iron ore in large quantities for Algoma Steel Co. at Soo, Ontario, that you can send trains out of here for Soo; the majority of the train would be St. Ignace tonnage, and at Soo Jct. they set out the Soo tonnage.

A time freight into Marquette from the west would, under ordinary circumstances, have cars for Marquette, St. Ignace, Soo and intermediate points. If a car came into Marquette from the west on a time freight, and was destined for Newberry, it would
1047 be set out and sent on, on the local; it would depend a good bit on what the car was. It might be sent on an iron ore extra, if such a train were running. If it arrived from Marquette from the West on a time freight, and was destined for Seney, it would get there in much the same way, unless it was a car of meat or perishable freight, when it would go on time freight, or the first train; if it were not perishable, it would go on the local.

That would be the same as to practically all shipments intermediate Marquette and Soo Jct. As a rule, the short-distance-haul cars go on the local, unless there are more than it can handle and not enough cars to fill out the time freight. The fact that you had a short distance of haul out of Marquette would not mean that the entire haul on that car had been a short distance. Soo Jct. is a division point, and the runs of locals 23 and 24 end there. The time freight from St. Ignace, with a shipment for points intermediate Soo Jct. and Marquette, would set out the car where it was going, unless it was destined to Munising, in which case they would set it out at Wetmore, to be sent into Munising Jct. by the local.

On a local, Marquette to Soo Jct., arriving on time, the conductor's pay for the trip would be $5.43; the hours of run would be 11 hours and 55 minutes, and the distance 119 miles. On a time freight, Marquette to St. Ignace, 151 miles, arriving on time, the conductor's pay would be $6.47; on these two trips, the time freight conductor is paid 4.15 cents per mile, and the local conductor 4.52 cents per mile.

On local 55, Nestoria to Thomaston, 50% of the time in station service represents my judgment of the amount, based upon observation; I have ridden on the train a great many times, and noted the time consumed on the train sheet. I have computed the time required to run the mileage, and subtracted that for the total time allowed between terminals.

1048 In making up a time card, we make allowance for where the work is, from our best judgment; I have never seen one yet where too much time was allowed, but often there isn't time enough; that applies equally to time freights and locals. I have

made up time cards for time freights where the allowance for stational service was not enough, and I had to extend the time between terminals; that does not occur frequently. I don't change time frequently, but, when I do, I endeavor to arrive at the average running time, so as to get the train as near on time as possible. I make up the time sheets myself, and get at the amount of time allowed for a time freight to do switching by a general knowledge of where the work is. I think the work of a local is much more liable to vary, particularly in different seasons of the year; the work of locals is different in winter from what it is in summer, but the work of the time freight don't vary much.

From day to day, I don't think the work varies much on time freight, but there are exceptions, as trains get late from causes beyond our control. Sometimes, the trains have to kill time, but that will occur more frequently with the time than with the local freight.

I notice a difference in the time consumed in working in winter and in summer; we haven't made any change to take care of that condition, but notice it in the lateness of trains in winter. Frequently, trains are late in winter, but not so frequent in summer; this lateness is caused by weather conditions on time freight and intermediate work on local.

The principal winter commodities of the road are forest products, flour, feed and some grain; the flour moves from Superior and Duluth to St. Ignace and the Soo; forest products move everywhere, mostly to local saw mills, but large shipments of telegraph poles, posts and bark are shipped interstate off the road and to lower
1049 Michigan; the milled lumber goes wherever it can find a market, generally off the road, most of it east through the Soo, and a lot of it to Chicago; a lot of it comes east, across the state line, into Michigan. Some regular log trains—telegraph poles and posts—move the year round.

I don't think that, from the records of one of these local trains, it is possible to reach a close approximation on the amount of stational service and running time. I based my testimony in part on reports, and mostly by observation. Every local freight, even though coming in on time, has done a large amount of station switching, and, where it is done within the time allotted to the train, there would be no report of it; the report is simply of delay, giving the reasons, and does not necessarily give the time consumed in doing station work. In making up time schedules, we allow about 50% of the time for switching work on the locals.

The coal, Marquette to the mines, is handled in the extra trains—ore trains. We limit the down train in ore service to the average of up train of empties; the trouble, in coming down, is to hold them. In bringing an ore train down the hills, it is necessary to apply the air for all it is worth, and keep it on; that means considerable wear of track, car wheels and brakes; it is in excess of what it would be running on level track.

In saying 5/6 of the freight business was interchange, I meant carload business, and included that received from and delivered to other roads; that is in tons, and 1/3 would be local. The auditor

and I took that off the books. My comparison, between the amount of stational service on interchange business with the service in originating or delivering a shipment, referred entirely to carload freight. In L. C. L. freight, in addition to the service I mentioned, the station agent makes a way bill, listing every article shipped, takes a
1050 tissue copy, and sends it to the auditor, daily. Take, for example, a shipment of L. C. L. freight from Seney, the billing and expensing, collecting the money, taking the item into his account, and reporting, would be performed by the agent; the freight would be loaded and unloaded by the train crew.

If that were a charge account, it would be kept by the agent, and weekly settlement made. Of the shipping points in and around Marquette, the Dead River mill is the most remote from the freight station, being 3.5 miles; the next most remote is the branch prison, 2 miles; the next, Upper Peninsula Brewing Co., 1.75 miles; the next, Sinclair Stone Quarry, 1 mile; the next, the Gas Works, Sambrooks' Mill and stone quarry, each .5 miles. The service of taking cars to, and spotting them for, these industries, and bringing the cars into Marquette, is all done by switch engine.

At Ishpeming and Negaunee, eliminating ore service, we have one switching locomotive for each place. We have one, and sometimes two, switching locomotives in service at St. Ignace; frequently, train 28 assists, there.

Our passenger trains do not lay up at Houghton; they are through trains, and lay up at Calumet; these trains run through Houghton, the same as through any other passenger station.

On February 13, 1914.

LYTLE recalled.

Further direct examination.

By Mr. Eldredge:

I am in charge of D. S. S. & A. maintenance. I have endeavored in a general way to ascertain costs of maintenance of its industrial spurs and mine branches. In my judgment, the maintenance cost of industrial spurs will average $300 per mile per year, and the mine branches $375.

1051 LYTLE.

Recross-examination.

By Mr. Wykes:

The cost of $300 a mile, estimated by me, to maintain log spurs and industrial branches, was average for the system; the maximum might be $375, and the minimum $200. I think it would be lower than the cost of maintaining sidetracks adjacent to main line; I do not know the average for all sidetracks. I base my opinion on the number of these industrial spurs that are not active, without many

tie renewals, while the sidetracks must be kept tied up, to support the traffic.

I fixed the average for mining spurs at $375; I think the maximum would not exceed $500. The cost stated for maintenance of industrial branches would not include the maintenance of the main line switch; that has to be maintained for main line traffic. I don't know, and cannot estimate, the average cost of maintaining a main line switch. It would be a considerable item for all the switches on the line.

Complt.'s Ex. 74, Delf, apportioning stational costs. In testifying to the apportionment of stational costs, I did not take into account car balances, nor the question of interchange of foreign cars. I did not take into consideration the question of car accounting, the duties of the car accountant, the adjustment of balances through the auditor's office, the item of repairs to foreign cars on this line, the movement of empties back and forth, the work in adjusting and filing tariffs, the preparation of divisional sheets or the expense of outside agencies, advertising or traffic associations.

1052 LYTLE.

Redirect examination.

By Mr. Eldredge:

I do not remember having testified to Complt.'s Ex. 74, Delf, but, in saying that the service given to interchange was four to one, as against the service given at stations, I did not take into account those things, except that I did take account of the work of car interchange, but not the debits and credits in the car office on interchange cars.

Three Pacific type locomotives, numbers 550, 551 and 552, came on to road after the end of fiscal year 1913; they are in passenger service, between St. Ignace and Calumet. These locomotives are about six tons heavier than the 12 new type freight locomotives, 700 to 711 inclusive (1912).

I can see no difference in the relative weight of loading in intrastate and interstate freight cars. In my judgment, the greater proportion of short-haul local business is handled by way freight than by time freight.

LYTLE.

Recross-examination.

By Mr. Wykes:

I don't know as my duties go into the traffic department; I solicit, and get, a lot of freight. I have reports of a number of loaded cars to go, but no reports from which we could gain information of the average car loading; my statement with regard to average car loading is based on observation alone.

I think the greater number of cars in traffic are open cars. You gain your knowledge by observation, riding along, looking out of trains, to see how they are loaded—for closed cars. You cannot gain that knowledge, unless you actually look into them, and we only get that from a general inspection of the total train tonnage.

You cannot, by looking into a car, tell whether the freight
1053 in it is interstate or intrastate.

LYTLE.

Redirect examination.

By Mr. Eldredge:

The eight plus miles of south track, Eagle Mills to Winthrop Jct., is made safe for passenger use, and is occasionally used for detouring passenger trains, in the event of a blockade on the other lines.

LYTLE.

Recross-examination.

By Mr. Wykes:

It is customary for one railroad to use the line of another, in case of blockade, for purposes of detouring, and that is about the use this track has for passenger purposes.

1054 On February 11, 1914.

MORGAN W. JOPLING, a witness called by plaintiff.

Direct examination.

By Mr. Eldredge:

I live in Marquette, and have charge of a real estate and land company—the Peter White Land Co. I have been renting property in Marquette for the last four years, and feel that I can form an accurate estimate of rental values.

I know the upstairs portion of the D. S. S. & A. passenger station in Marquette. In my opinion, the offices on the second floor of that station, would rent for $100 a month.

JOPLING.

Cross-examination.

By Mr. Wykes:

For office purposes, the lower part of the station, assuming it to be divided into the same rooms as the upper part, would rent for approximately the same.

I am one of the defendants in this case. Mr. Eldredge consulted me before he filed his bill, and I was made defendant on his initiative.

I recently purchased the land where the Colonial Building stands on Washington St.; that adjoins the Opera House on the east, and is the building Mr. Asire is in.

JOPLING.

Redirect examination.

By Mr. Eldredge:

I paid $9,000 for this property—49.5 feet frontage on Washington St. by 150 feet deep.

1055 On July 21, 1914.

JOPLING, recalled.

Direct examination.

By Mr. Eldredge:

I was present during Mr. Werner's examination; I know the southwest corner of Front and Washington Sts. Our estate owns property further down Front St., and I own property on Washington St., and other property throughout the city, and think I know the value of business property in Marquette. In my judgment, the value per front foot on Front St., southwest Washington St. corner, exclusive of buildings, is $350 per front foot.

JOPLING.

Recross-examination.

By Mr. Wykes:

That is the very best corner in town, and better than any of the other corners at that street intersection.

1056 On February 12, 1914.

EDWARD C. ANTHONY, a witness called by plaintiff.

Direct examination.

By Mr. Eldredge:

I live in Negaunee, having lived there since 1864. I am 74 years of age, and came to Marquette County in 1856. Marquette then had 600 to 800 inhabitants, and Negaunee 200 or 300; the settlement at Ishpeming was the Lake Superior Mine, and a few log houses along the Marquette and Bay de Noquet road. That railroad was there in 1856, and subsequently part of M. H. & O.

I was a brakeman on the Marquette & Bay de Noquet two summers, 1859 to 1861; the road then extended 20 miles, but we did not operate the two or three miles west of Ishpeming. The road extended 20 miles west of Marquette; we understood at the time that they had to build 20 miles to get the land grant, and we had no use for the upper end. The Marquette, Houghton & Ontonagon constructed the road west from near Stoneville, and I am pretty sure it reached Michigamme by 1864.

ANTHONY.

Cross-examination.

By Mr. Wykes:

The Marquette & Bay de Noquet line goes straight out from Marquette, west; the Marquette and Western, or south line, was built many years later. When the road was extended west from Michigamme, the country was practically unsettled from there to Houghton, except a little settlement at L'Anse, perhaps at Chassell, and the Mission at Baraga; there were no farms or anything of that character along through the country. When the railroad went west from Nestoria, in 1887, it went through a practically wild country.

Going east from Munising was a wild country, to the Soo, when the D. M. & N. went through, and down to St. Ignace, there were
1057 no farms along the line, but there was a settlement at St. Ignace.

1058 On February 12, 1914.

EDWARD R. LEWIS, a witness called by plaintiff.

Direct examination.

By Mr. Eldredge:

I am, and have been, a civil engineer, for 24 years, being graduated from the Iowa State University. In 1906, I went to the Keweenaw Central as Assistant Chief Engineer, and spent a winter locating between Calumet and Keweenaw point, designing a few bridges and laying grades and track. In July, 1906, I went to Bay City, Mich., as Division Engineer, on maintenance, of Michigan Central, remaining there until I came to South Shore, July 1, 1912, as assistant to General Manager, doing engineering, principally.

I have given study to the apportionment of expenses of maintenance of way and structures between freight and passenger. In my judgment, the revenue train mile basis is proper for use in the apportionment of such expenses, so as to divide them with some degree of accuracy.

Answering with the list of items in maintenance of way and structures before me, that basis can justly be applied to all those expenses except one or two items. The reasons why revenue train mile basis will equitably divide these items of expense is that: You must dis-

tribute the expense to the cause which makes that expense in that proportion to which the cause applies. In my judgment, the revenue train mile basis does that; in each of the items mentioned, all or a portion of the expenses are caused directly by either passenger or freight service. I don't see how you can divide superintendence in any other way. It is occasioned by the one service or the other, in proportion to the train mileage.

A portion of ballast deteriorates on account of the elements, as do ties. The chief element of the roadway and track expense, which is largely a weather expense, is labor.

1059 Probably more of removal of sand, snow and ice is due to passenger than to freight train service.

Of bridges, trestles and culverts, a little more is due to passenger trains than to freight; the element of weather there is extensive; conservatively, 75% is due to weather.

The expense of snow and sand fences and snow sheds is caused a little more by passenger trains than by freight.

In buildings, fixtures and grounds, after the actual expense has been allocated to each service, there is still a little more due to the passenger service than the freight. The weight of the freight train is greater than that of the passenger train; that would not tend to a division on weight rather than on train mileage basis, as you have the speed versus the extra weight. The wear and tear on tracks—roadbed—is not due so much to weight as to impact. The weakest part of the track is the joint; the impact not only destroys the fastenings and joints, but breaks the rails. The excess in weight of the freight train causes slower freight train speed than passenger. It produces more wear on rail, especially on curves, because of the higher super-elevation necessary for the safety of the passenger train at its higher speed.

This super-elevation not only retards the freight train, but restricts its tonnage; this restriction is an appreciable amount, and makes it necessary to reduce the grade on the curve .03 to .05 of a foot, per hundred feet of curve, per degree of curvature. The wear and tear effect of super-elevation on curves, extends to the whole track structure; it tends to displace the ballast inside of the curve, it rolls the rail out, cuts the spikes and ties, and affects the freight equipment unfavorably, to an appreciable extent. It does not affect the

1060 passenger equipment, as the curve is elevated to suit the passenger speed.

There is a higher grade of maintenance on South Shore on account of passenger service than would be necessary for the freight service, in that you elevate your track for passenger trains; you must have a better track for passenger trains, for safety, than for freight, and that costs more money.

You have to get your track in shape for the long winter during the short summer, making the work more expensive, because it costs money to hurry. That is caused more by passenger than by freight, because you have to have it in better shape. During the winter, a large percentage of work is done on account of passenger service, to keep the road smooth, and more frequent patrol is necessary in cold

weather, to guard against broken rail; it is easier and less expensive to maintain a railway where there is no frost than in this country. The most of that extra expense you must charge to the passenger service; that is what increases the cost.

Bearing on removal of sand, snow and ice, and snow and sand fences and snow sheds, there is more necessity for protection of passenger trains against snow than for freight trains; therefore, a proportion of snow fences are in excess on account of passenger service.

We haul a large proportion of our material going into track and roadbed in revenue freights; I don't think of any material used in exclusive passenger business so hauled. The ballast of the eastern division is largely hauled in revenue trains; that is of considerable importance as an item of expense.

The train mileage basis should be applied to all tracks, including terminals; you could differentiate and split hairs for a hun-
1061 dred years, and you wouldn't get any closer to it than you would if you took all the tracks. If there be any error, I think that the train mileage basis, even taking all tracks, assigns less expense, if anything, to the passenger service than it should.

LEWIS.

Cross-examination.

By Mr. Wykes:

I have never previously testified to the propriety of the revenue train mile basis. My idea is that the division should be upon the factors which produced the wear or cost.

Q. Why, then, should you divide, upon the revenue train mile basis, trackage over which no revenue train miles are made?

A. Because you have a great many other items on the other side of your accounts. On South Shore, the passenger service is not one-half, and these tracks have been left in to offset that preponderence on the other side. I think there is hardly one of these exclusive freight tracks that a passenger train doesn't get on to once in a while, for purposes of passing, etc.; they get on to those tracks on every railroad. Because once in a year, or in two years, or random instances of that kind, a passenger train may on some occasion get on to one of these tracks is not the only cause for dividing their maintenance expense on revenue train mile basis; I said that was part of the cause.

I do not wish, in any sense, to go back upon the rule, first stated, that the cost should follow the thing which produces it. The chief reason for putting all tracks in is because there are other items on the other side of the account; e. g., excessive wear on track by freight trains, removal of sand, snow and ice, snow and sand fences and snow sheds, and roadway and track; I think that is all.

1062 Q. Now, why is expense of roadway and track an offsetting element upon this particular item of sidetracks and branches; just give us that, please?

A. Because there is more expense of that item due to freight train than passenger.

Mr. Eldredge: Did you answer that exactly as you intended?

A. Due to passenger than freight.

Q. In what way due to passenger; why?

A. Because of higher speed of the passenger trains, and the greater effect that they have on the track.

I wouldn't care to express that in a percentage off-hand; I should think it could be done. To do so, you would have to keep the account of the cost; I don't know that I would explain it further. I say you would have to find out how much it cost. You would have to go into each various item of expense of running each train and wear on the cars and track, going into the account in detail. I have not done that on this road, nor on any road, exhaustively. You could find out how long your ties and material lasted, and divide by the number of trains, on a train mileage basis. I intended to say that you would have to keep the accounts—the actual figures. This revenue train mileage basis would be an approximation. I have not been able to fix the limits of error or percentages within which that approximation would be certain or uncertain. I have not done that, and don't know anybody that has. This is the best basis I have thought of; no others were satisfactory.

I have thought of, and discarded, the ton mile basis; you might take the locomotive mile basis; I don't think any of them nearly so good as the train mile basis; it is merely my judgment. I have never gone into it with that certainty that would permit me to say how close that would come to actual analysis of the accounts
1063 if kept with the idea of making separation, except in a comparative way. It is my judgment that the accounts could be so kept that you could get pretty close to a correct separation between passenger and freight, by making the charges as the work is done.

I wish to change what I said as to keeping accounts to reach a close approximation; on reflection, I do not believe you can do it. It must be, to an appreciable extent, arbitrary.

Q. That being true, in your judgment, now, there is no real test of the correctness of the judgment of the man who furnishes the basis for doing that, other than the judgment of some other man to confirm it. I mean, it is a mattter that rests, and must rest, solely in judgment, this division between passenger and freight, and the proper basis therefor; it cannot rest in accounts, according to what you now say?

—. Not altogether; it can rest in accounts, as I told you, to some extent.

Q. You have never prepared any figures to indicate the justification of the revenue train mileage basis, have you?

A. No.

Q. And you do not know of any one else who has reduced that to figures?

A. No.

Q. The justification for it, then, rests in judgment, rather than in figures, does it not?

A. A certain percentage of it rests in judgment, certainly.

Q. What part of it does not rest in judgment. Or, what tests, in the way of figures, can we apply to determine whether the
1064 witness who says that it is proper is correct, or the witness who says that it is not — correct?

A. I would say every railroad is keeping accounts, and the judgment that you give must be based on those figures. You could not say that you could divide on a train mile basis.

Q. Now, what investigation have you made of the accounts of the South Shore, to test the correctness of your judgment on this particular question.

A. I have not made any.

Q. You have not made any?

A. None, except the figures I have seen and the accounts that they keep.

Q. Now, you say, first, that the speed of passenger trains produces a wear upon track in excess of the wear of a freight train going the same distance. Have you, or can you refer to, any figures which would indicate that to be a fact.

A. Why, yes.

Q. Give me the figures then?

The Master: I do not see what figures he could give.

Mr. Wykes: Well, he says there are figures.

A. Your labor and material costs you more if you have to keep your track up for passenger trains than they do for freight trains. Now, the figures are that it costs you more money.

Q. Is there any source that you can go to to pick out the parts of any figures that relate to the passenger cost or to the freight cost?

A. No, I do not know as there is.

Q. When you say that figures would represent that, you mean it is an expression of amounts based upon the judgment of the
1065 expert to the effect that the one costs more than the other; that is what you mean, is it not?

A. Yes.

Q. And you cannot refer to any figures that will indicate a certain cost for the freight train mile and a certain other cost for the passenger train mile, in the wear of track, or roadway and track?

A. No.

Q. And I think you stated yesterday you had not been able to express that in a percentage, even?

A. No.

Q. And you did not know of any one who has?

A. Not precisely of any one who has done it exactly.

Q. Do you know of any one who has attempted to, as fixing ranges of percentage?

A. We are all trying to arrive at a basis on this matter. It is, to a certain extent, arbitrary; I admit that.

Q. Do you know of any one who has fixed a range of percentages

that would be the high and low mark of the excess wear by a freight train mile from a passenger train mile?

A. No, sir.

The Master: Is there any possible way of figuring the percentage?

A. I would not like to say that it was not possible, absolutely, but it is not possible to date, I believe.

Q. Then, so far, it rests solely in judgment?

A. Yes.

Q. Unless we have new light, it will continue to do so?

A. Yes, I believe so.

1066 Q. Now, the element of greater cost attributable to passenger service due to elevation of curves, are there any figures that you have been able to determine that will indicate that extra cost?

A. I would have to answer that in the same way, to a certain extent, yes.

Q. Give us the figures, then, or percentages, either way?

A. I could cite instances where a reduction of super-elevation in a curve permitted the hauling of more freight by the same engine over that particular portion of track. Those matters are of record.

Q. But that goes outside of the range of the thing upon which you testify, because that does not go to the question of expense of maintenance of way and structures?

A. Possibly I misunderstood the question. You did not say whether it was maintenance cost, or whether it was not. You did not stipulate expense of maintenance.

Q. No, I did not stipulate expense of maintenance. But, as a matter of fact, your testimony referred to the division of maintenance cost on the revenue train mileage basis, and the revenue train mile does not comprehend any division of the limitations upon the amount of traffic that a particular structure would produce. Simply, you use the revenue train mileage basis for the division of expenses, and it was to that that I intended the question directed. If you will answer it in that light, it will satisfy me.

A. I think I have completed my answer.

The curves on a railway for freight traffic are elevated for a speed of 15 miles per hour; where we have freight and passenger trains on a single line, as a matter of safety, the curves have to be ele-

1067 vated much higher for passenger, which makes it more difficult for freight trains to get over the road.

The limitations imposed upon the freight track in the ratio of reductions of tons depends upon the degree of curvature. Five degree curves are considered sharp curves in this country, on main track. The percentage of difference in the amount you are able to haul, as between a curve elevated for 15 miles and one elevated for 40 miles an hour, with a radius of five degrees, is about 6%. The real limitations on South Shore traffic are the grades; curves produce the effect of grades.

I could not tell you the limitation produced by a 1% grade over a straight (level) track, there being no curve; nor can I tell you the limitations of a 2% or 2⅝% grade; it could be figured out. The

grades furnish the real limitations of loads on the South Shore. With curves eliminated, the grades would still cause limitations; the curves cause limitations over what now exists over grades on straight track. The grades on straight track now produce or cause limitations on the quantity of freight that can be hauled.

If you had a curve on a level track, you would not have the limiting conditions. I have known 40 miles an hour to be made around a 10 degree curve by a passenger train, but that is an extreme case. The safety would depend on the elevation. I do not know how many curves there are on the South Shore. I have made no classification to determine the number of curves of different degrees on the entire line; I could tell you on certain portions. On certain of the grades it is necessary to put on an extra locomotive, to get the freight trains over; e. g., at L'Anse and Ewen.

1068 While I have not calculated the average difference in power to the freight engine consequent upon the excess of super-elevation of curves, I should say that, on an average, that excess of super-elevation makes a difference in every ton hauled over the road of 2.5%, meaning you can haul that much less freight in weight. That percentage involves the mechanics of curve resistance.

One of the factors of the centrifugal force is weight; it would be less for 50 than for 100 tons. I could not tell you the average freight train or passenger train tonnage on South Shore; it is very much less for passenger. I have not estimated, and do not know, the percentage of South Shore trains carrying capacity loads. They are supposed to be loaded to their capacity; if we do not have the traffic, we would not send out the train. Through trains are loaded full, as nearly as possible. Way freights sometimes have to be sent out. The scheduled trains run according to schedule.

I think the grade, rather than the curve, or, rather, the grade in combination with the curve, is the limiting factor on all divisions.

You could haul more up L'Anse hill if you did not have the curves, especially those at the top. Assuming a curve elevated for 20 miles an hour, and a freight coming on to it at 35 miles an hour, it would slow down very suddenly, and cause the cars to incline to the inside of the curve very sharply, thereby raising the center of gravity, and tending to derail top-heavy cars. It might leave the track. If it did leave the track in such manner, it would be a considerable item of expense; it would be inadvisable, and verging on the unsafe, to operate at that speed.

In going down these hills, they keep the train under full control, whether passenger or freight, and the down speed is slower than on straight level track, for both; going up a grade like

1069 L'Anse hill, the speed is greatly diminished, in either character of trains. Calculated on the basis of loss of power, the curve reduces locomotive capacity 2.5%; that is the one thing I have been able to reduce to a percentage out of the greater cost. The others I haven't been able to express any percentage for, and don't know exactly what weight they would have.

Q. Did you figure, in percentage, the weight that should be given

to the freight side of this, due to the greater tractive power required of the freight locomotive? I am not speaking about curves, but I am speaking about the revenue train mileage basis, generally.

A. Well, only such as my knowledge and judgment dictated.

Q. Were you able to determine a percentage for that?

A. No, I think it would be very difficult.

Q. Were you able to determine a percentage due to the greater number of car wheels and wheel impacts in the freight service than in the passenger service?

A. No, I haven't reduced that to a percentage.

Q. Were you able to determine a percentage due to the greater load in the freight service than in the passenger service?

A. I did not do it.

The Master: Would you have to have the composition of each train, in order to do that?

A. Yes sir.

I took into account the extra time that would be consumed by the freight train in getting over the track, to the extent of knowing that the condition exists. I haven't reduced it to a percentage. Freight trains are delayed, largely, by keeping out of the way of pas-
1070 senger trains, which tends to make them slower. The percentage which should be added to the passenger side, for the latter element, I could only estimate; that rests in judgment.

I cannot tell you the consideration I gave to the fact that the freight train is longer in making its mileage than the passenger train in the part of the expense of maintenance of way and structures due to weather conditions; I thought of it, and considered it, and did not make any percentage because I didn't make any figures on the subject. The only other thing I can think of to produce extra cost on the freight side is the small matter of freight siding yard tracks.

The ice expense comes in at water stations, grade crossing, and where switching work is done. After a sleety storm, there is a good deal of work to clear the track of snow and ice, especially on the main track, where the switch engines do a very great deal of their running; it is much less elsewhere than on the main track in yards.

Removal of sand, snow and ice requires considerable work around switches; most of the hand work is done at switches and water stations—main track switches; sometimes the sidetracks kept open are cleared with snow plows, and sometimes not. The shovel work under this item cannot be separated from the snow plow work, nor the switches and sidetracks from main line. The freight traffic, other than iron ore, on South Shore, is heavier in winter than in summer; that requires keeping clear, during the winter, of tracks used in freight service. A large percentage of the freight tracks are used in winter; the traffic spurs are kept clear if they are used in winter; logging spurs, etc., are usually used in winter, when there is any operation at all.

I cannot give you the comparative life of a switch and a piece of straight track on South Shore; certain parts of the switch have
1071 less life than straight track, with the same amount of traffic—the frogs and switch points, for example; the frogs must be

taken out, repaired and put back; frequently, switch points can be repaired in the track.

It is my judgment that there is a considerable expense in maintenance of way and structure due to starting and stopping of trains; that being done with an air brake puts a much greater strain on the structure on which the engine and train stands; e. g., stopping a train on a bridge, or reducing the speed, with an air brake puts a terrific strain on the structure, causing impact. The starting of a long freight train causes an additional strain; the longer the train, the more slack there is, and the more impact in taking up that slack. The locomotive, itself, in starting without a load, or with one or two cars, is an item of considerable stress on the tracks; that would tend to displace ballast, and wear ties and rail; I shouldn't say the starting of a train would be a very great stress on ordinary track; continual starting and stopping at a particular place would cause a hardly appreciable effect; it has that tendency, but it would be small except in case of a bridge.

I have never investigated coal costs of starting and stopping trains; it would take more coal to get a train under way than to keep it moving, after it was under way. That 75% of the bridge maintenance cost is due to weather is conservative; the rest of the cost would be the wear on a bridge due to the movement of trains over it—the effect of the rolling load. An appreciable part of roadway and track cost is due to weather; a large part of the winter work is due to frost.

Q. When you get through with the revenue train mileage basis as a basis for apportionment of common expenses between passenger and freight, I think you have said it was an approximation, and it rests entirely in your judgment, I take it, without building it up on figures or percentages?

1072 A. It is not built up on percentages.

Q. It rests in your judgment of that being a proper basis?

A. I don't like to leave figures out altogether in this thing, because figures are the basis of it, after all.

Q. Your judgment acts on the figures?

A. Yes.

Q. And you haven't produced any figures, with the exception of those you gave for the curves?

A. That is all.

Q. And you haven't any to produce?

A. No.

Q. In what manner can that judgment be tested?

A. To a large extent, precedent. There is experience, in all of these things, from which we form our basis of opinion.

Q. But it can only be tested by opinion; it cannot be tested, to say that you are right, by percentages or figures; it must be tested by opinion and by judgment?

A. Yes.

Q. In what way can we determine whether you are right or whether the witness who says the revenue train mileage basis is not a proper method of division is correct?

A. Only by judgment.

LEWIS.

Redirect examination.

By Mr. Eldredge:

I heard Mr. Young's testimony, yesterday, regarding impact of trains in striking bridges. I know, and it is a well known
1073 fact, that impact is a larger consideration in the deterioration of a bridge than weight. When a load rolls, there must be impact. I do, and I do not, agree with Mr. Young as to the effect of the first impact. He said the greatest impact on the bridge was the first blow; that is the case, but it is due to the effect of striking the end of the structure, more than to the fact that there is greater impact; you are striking the end of the structure, from solid track, instead of striking it in the middle. You are coming off of a comparatively immovable structure on to one in which there is some give; if you didn't have that element, the impact would be the same. The effect of the impact in striking the end of the bridge is the greater.

LEWIS.

Recross-examination.

By Mr. Wykes:

I have not determined the amount of impact that would result from a train weighing, say, 40 tons, going at a speed of, say, 30 miles an hour, as against one weighing 80 tons, going 20 miles an hour; I am simply stating theory; I think I have determined that a good many times. I know what effect the increased load produces on the impact, but this element enters in. We restrict the weight to the safe load, allowing for impact; the amount of load must be taken into account in the amount of impact. You would take the weight of the engine; the train is not on the bridge.

1074 On February 18, 1914.

ROBERT B. RIFENBERICK, a witness called by plaintiff.

Direct examination.

By Mr. Eldredge:

I am, and have been since 1896, a civil engineer; I am now Consulting Engineer of the Detroit United Railway.

I was employed on D. S. S. & A. during construction, Nestoria to Iron River, Wisconsin, in 1887. When I went there, the cuts and fills were completed, the rails were down, and some, but not the full quota of, ties were. The land was heavily timbered—virgin forest at that time.

I remember no town from Nestoria west, except Dogwood, now

Saxon. The railroad crossed the military road at Bruce's Crossing. My work was putting in alignment and grade stakes for ballast; we had to widen out practically all the embankments to standard widths, and clean out the cuts, before we could ballast. This was by reason of the sinking and sloughing off of the roadbed. We sometimes raised embankments two or three, and in some instances four, feet; we had several sink holes where we put carload after carload of material; they would stay up for a while, and then we would go back and put on more.

That, originally, was considerable; I have no accurate memoranda or data of the number of yards; I think it would run into hundreds of thousands of yards. The grading had been done by contract, and was completed and accepted as being up to grade and specifications; at least, no question on that subject arose after I was on the ground. I remember no embankment that did not require some widening and dressing up; the larger embankments require the most. I think I was engaged on that work all that summer, and we had construction trains continuously.

1075 RIFENBERICK.

Cross-examination.

By Mr. Wykes:

When I went on to the road, it was completed, as far as the original grading was concerned, and the contract work was done; it was completed to subgrade, and the ballasting would necessarily come after ties and rails were laid.

The going wage for common labor in 1887 was exceptionally high up there; we had to pay $2 a day for poor labor.

1076 On March 24, 1914.

SUMNER G. HORTON, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I live at Flint, Mich., and am 49 years old. I am employed by State Tax Commission, as foreman; have been with them 12 years, except three years. The last four years, I have acted as examiner and special assessor, giving my whole time to valuation of property. I have present charge of valuation work in Grand Rapids; the purpose is to place that city on a cash value basis. Previously, I had charge of valuation in Van Buren County, and previous to that in Marquette County with Mr. Twiss. We spent about eight months in the latter county with a force of five to seven men; Twiss was there during the time we were at Marquette city, possibly two months. We went there Feb. 22, 1913, and had made some preparatory work be-

fore that. The values we reached there were used for purposes of assessment in 1913.

On Complt.'s Ex. 1*b*, Riggs, description 2, figure 2, in Marquette County, right of way, from Chocolay depot, mile post 150.56, to mile post 151.92, 1.46 miles. At East Lakewood, the lots are 100 feet wide, and vary from 440 feet to 1,100 feet in length; about 12 are above 800 feet, eight are above 600 feet, and the seven remaining lots run from 440 to 476 feet in length. In Riverside Add., Lakewood, all lots are 100 feet wide, and vary from 400 to 700 feet in length; about 12 lots are above 500 feet long, about 10 lots 400 to 500 feet long, out of a total of 51 lots; plat lies parallel to south line of South Shore, south and west of railroad, on each side of Chocolay River, and lots in most cases run to river.

In East Lakewood, lots 2 and 3 sold for $175, lot 7 sold for $95, and lot 8 for $100. In Riverside Add., lot 21 sold for $75,
1077 lot 22 for $120, and lot 24 for $100; these considerations are verified by myself, either through owner or Mr. Asire, who sold them. The north end of these lots runs to railroad; houses are built facing both ways.

In the plat of Lakewood, lot 1 sold twice for $100, lot 2 for $120, lot 3 for $120, lot 4 for $100, lot 5 for $100, lot 12 for $125, and lots 16, 19, 21, and 26 for $100 each. On description 3, mile post 151.92, at the city limits, to mile post 153.5, where the main line enters Lake St., I valued the land at $100 per acre; we placed it there for purposes of assessment. On description 6, Marquette County, 170 feet on west side of Lake St., immediately south of Hampton St., I valued the lots at $200 per lot. I based that value on value placed on adjoining lots, by our examiners. We made very little change in the values placed by the committee in Marquette on these lots.

Description 7, 47 lots between Hampton and Mesnard Sts., I valued at $200 per lot; on description 8, $100 per lot. We had no sales of vacant lots; we estimated what buildings were worth, and deducted that value from the total value; we had sales of lots with buildings.

In description 9, right of way from east line of Adams St. to city limits, on south line, mile post 272.75, 26.60 acres, I valued land at $100 per acre, to Catholic cemetery, and $25 from Catholic cemetery to city limits. On description 10, right of way to Marquette quarry, I valued at $80 per lot; lots are 50 by 134 feet; we paced them off to get the size, and had reference to sizes of adjacent lots.

I do not recollect any sales of lots in this neighborhood; we had some sales of lots with buildings on, and by deducting the value of the building we could tell what the lots were worth.

1078 In description 11, lots fronting on west side of Lake St., between Jackson and Mesnard Sts., I valued the eight lots at $400 per lot; lots are 66 feet front and 134 feet deep.

In description 12, 12½ lots, 66 feet wide, between Jackson and Mesnard Sts., I valued lots 41, 42, 43 and 44 at $250 each; lot 1 and east half of lots 31 and 32 at $250 each; lots 69, 70, 71, 72, 73 and 74 at $200 each.

In description 13, land fronting on west side of Lake St. from Jackson St. to north line of Ely lot, 1,000 feet, I placed a value on the

first eight lots, 66 feet each, starting from south, at $500 each; the second 8 lots at $600 each, and 4 lots at $250 each; total, $9,800 for parcel. Those would be in rear of Champion St. lots.

In description 15, 184 feet frontage on Front St., south of Baraga, I valued land at $90 per front foot on Front St.

Description 16, tract of land fronting on west side of Lake St., extending from north line of Ely lot to Baraga Ave., 1,110 feet, I valued at $15.00 per front foot, measured on the street.

In description 17, right of way fronting on Baraga Ave., parts of lots 3, 4 and 5, block 3, C. M. & I. Co. Add., and a small triangle adjoining lot 3, I valued land at $30 per front foot; I had no sales in direct vicinity.

In description 18, right of way fronting on Spring St., also triangle on corner of Third and Spring Sts., I valued land at $20 per front foot on Spring St., including triangle.

On description 24, 69.7 feet frontage on Front St., being ap-
1079 proach to ore dock 4 on both sides of street, and approach to dock 5 on east side of street, I valued land at $150 per foot on east and west side of Front St., north of Main, and $125 per foot on easteast side of Front St., south of Main.

On description 26, frontage on east side of Front St., 30 feet, $125 per foot on Front St.; in description- 27 and 28, the site of the passenger station, I valued the portion facing Front St., 183½ feet (153½ feet up to right of way of the Jackson cut) at $150 per foot, and for the remainder of the description, back of the Front St. lots, I took the same number of feet facing Third St., at $40 per foot. Lots are 124 feet deep on both streets; that leaves a parcel 326 feet by 183½ feet deep at $45 per front foot on Main; total, $49,760 (for the two parcels, just the land).

On description 29, which is 14,608 square feet back of the buildings fronting on Washington St., I valued the lot facing Third St., 38 feet side by 127 deep, at $50 per front foot. For the balance, 12,386 square feet, or 220 feet in rear of lots on Washington and Main, I added 15% for Washington St. frontage, or $4,950. I added this to Washington St. frontage, because this would give the property on Washington St. and entrance to the rear, or place to extend their buildings; it would be worth more for that than for any other purpose.

On same exhibit, description 30, and between Third and Fourth Sts., I valued 270 feet on Third St. at $40 per foot, and 120 feet on Fourth St., at $30 per foot, and 250 feet on Maple St. at $20 per foot, making a total of $19,400.

In description 31, lands lying between Fourth and Fifth streets, I valued land on both streets, 120 feet deep, at $20 per front foot, with a depth of half way across the block.

1080 On description 33, I placed a valuation of $19,000, on 54.69 acres, and included in this $7,000 on 35 lots on Washington St.: the balance I figured as acreage, at $12,000.

On Complt.'s Ex. 6*a*, Riggs, in this description, a parcel of 4.09 acres, divided into a tier of lots on Washington St. and acreage in the rear, I valued the lots at from $300 each, starting from Park St., to

$250, up to Seymour Ave., and the area back of that to the south at $180 per acre; this value would extend through the green parcel, 7.15 acres to the south, and west to Seymour St.

Nester Add. is in this neighborhood, north of Washington St., Block 1 has 16 houses on 26 lots, block 2 has 10 houses on 29 lots, block 3 has one house on 26 lots, block 4 has one club house on one large and 17 small lots, block 5 has no houses, block has one house on 26 lots, block 7 has 7 houses on 31 lots, block 8 has 7 houses on 23 lots, block 9 has one house on 26 lots, and blocks 10, 11 and 12 have no buildings.

West End Add. lies directly west and north of Nester's Add.; it has no houses—about 157 lots. Homestead Add. lies south of description 33; it has 6 houses and a greenhouse, on 103 lots.

In description 34, right of way from tract 33 to fly switch at end of Dead River railroad, I valued at $100 per acre, same value we placed on adjacent lands. I was present at sessions of Board which placed these values; Harlow Clark, in the immediate neighborhood protested against the assessment.

In description 35, right of way from description 34 to west city limits, 2.29 acres, I valued at $100 per acre, same as adjoining property.

1081 In description 36, right of way, Dead River railroad to to North Marquette through the West End plat, approximately 160 rods, I valued at $100 per acre; following on from the West End plat, through section 15, at $30 per acre; section 10 at $50 per acre; lots 3 and 5 in section 11 at $100 per acre; sections 2 and 11 at $160 per acre; beyond the West End plat, land adjacent to railroad is cleared, but not improved—stumps and brush most of the way.

In description 38, from Marquette city limits, on south line, to Eagle Mills junction, I think value placed was $5 per acre on vacant lots adjoining city, but did not value it myself.

In Marquette, I made personal investigation as to conditions, and verified sales values as taken from records; had a considerable number of sales there. In verifying sales, I learned, either from buyer or seller, or someone that knew, the actual consideration and conditions of sale; we made inquiries of many people. After the investigation, I felt competent to place these values. The values in each instance are my judgment, based on value of adjacent lands without improvements in shape of buildings and structures.

Mr. Harlow Clark protested to the Board against a value of $100 on lands west of 72 acre tract; he claimed it ought not to exceed $75. Mr. O'Meara protested against values placed in vicinity of description 15. The values against which he protested were the same as placed on the 184 feet in description 15; his property is directly across the street, on the corner.

In description 30, Mr. Clark appeared for the same reason he did before. His property lies across Maple St. directly adjoining on the south; values on his lands were fixed on the same basis as values fixed on this description; he claimed they were too high.

1082 I had a sale on south side of Washington St. between Front and Third Sts., lot 2 of block 15, at $4,200; it was bought

from an estate, for purposes of building Elks Temple; it had 38½ feet frontage, and a building which was sold for $150 and removed.

HORTON.

Cross-examination.

By Mr. Eldredge:

I went to Marquette Feb. 22, an stayed until October; I worked on city of Marquette to June 1st; started outside in March and April and when weather got so we could. We had six assistants part of the time—two during May. I finished Marquette some time in June; had two assistants after June 1st. Mr. Twiss was there abount five weeks in April and May—maybe first week in June.

I personally reviewed the property that the examiners had examined, and examined and placed value on a portion of the city, myself; in reviewing property, I took the examiners' notes and valuations, and made comparisons; I went out and saw the property, and made inquiries about it. Mr. Hubbard, Mr. Keith and Mr. Davis were examiners; none of them lived in Marquette.

On east 50 feet of lot 5 of block 11, lying next east of opera house on Washington St., I found, at time of inspection, a vacant lot assessed at $4,000 for 1912; the committee placed a valuation of $6,500 on it; I valued at $8,000 for 1913, after the sale, thinking the party paid too much. He was forced to pay more than it was really worth, it being the only vacant lot left.

We tried to place the true cash value in every instance—the usual selling price under ordinary circumstances. When there had been no sales in the neighborhood, we would try to find out what anyone would pay for it, and what the owner would ask for it; that would assist in helping us to place a value on it.

1083 On Washington St., each way from the corner, we made very little difference in the value of the land over that on Front St. I valued property on Washington, corner of Front, at $200 per front foot, $175 for next lot, and $150 for the remainder in the first block; I put same value on west and east sides of street, as far as Main.

In description 24, I placed value on 697 feet frontage on Front St., between Washington and Main, at $150 per foot; it lies right next to Marquette County Savings Bank, which stands on one of the best corners in the city, which we valued at $200 per front foot. I found no sales there; I valued lots on the corner of Front and Washington at $200 per front foot, and property on side of Front St., opposite Savings Bank, at $150 per front foot; in other words, going west on Washington Street, I put a valuation of $175 per front foot next to the corner, and, on Front St. $150 next to the corner.

On that basis, the Jopling purchase would have been $7,500; I put $8,000 on it, because I thought that was about what it was worth. I valued the opera house and all the way to Third St. at $150 per front foot. The land sold to Elks Temple was left at $4,500; I paid

more particular attention to frontage; Elks lot frontage was 38½ feet; I estimated the depth, but knew it was a shallow lot. I valued west side of Front St., opposite the 69.7 feet of parcel 24, at $150 per foot, and put the same value on both sides of street. Property on Front St. is of no greater value than property on Washington St. I wouldn't make any great difference.

On item 29, after valuing lot on Third St. 39 by 127 feet, that left 12,386 square feet; in valuing this at 15% of Washington St. frontage, I only went to within 127 feet of Front St. The valuation to Front St. had already been placed in description 24. I placed this
15% valuation, because it would add 15% to value of Wash-
1084 ington street frontage by having that extension. The 15% is my judgment of value.

We used the committee's valuations where we felt justified in doing so; we were governed by them, to some extent. I valued railroad property according to my idea of value of nearby or adjoining property.

In description 33, I valued the 35 lots on Washington St. at $200 a lot, $7,000; about 15 lots would be on the 4.09 acres. I valued the remainder of the 54 acres, together, at about $180 per acre; depth of Washington St. lots is 124 or 132 feet.

I valued lots in Harlow's Add. No. 3 at from $300 to $400 each; they were all 50 foot front, and varied in depth from 80 feet, next to Fifth St., to 125 feet on Park St. end. I had reference to values from Seventh to Park Sts. in fixing these. Lot 40 in this addition is worth $300. I valued 15 lots at $300; they would average 50 by 132 feet—six lots, or $1,800, to the acre. I valued land immediately south of those lots at $180 an acre; they are not available at present. I arrived at the $1,800 an acre value for lots on Washington St. by simply placing a lot value on an improved street. I arrived at the $180 an acre value by what I thought it would sell for; that was on the basis of 70 acres. This 70 acres covers the south half of northeast of section 2 lying south of center of Washington St., produced, except part used for railroad purposes, and except 528 feet wide, described in Liber K. of Deeds, also part of southeast of northeast of section 22, lying between right of way of D. S. S. & A. and that of former B. De N. & M. railroad.

I valued lots on north side of Washington St., from east line of Seymour Ave., west to Lincoln Ave., at $250 to $350 a lot; they are 50 by 142 feet.

1085 I valued lot 14 of Nester's Add., without improvement, a corner lot, at $350; lot 1, in same block, a large lot in the corner, next to park, at $500—no house. I valued lot 1 in block 3 at $200, and lots 11, 12 and 13, together, at $525.

I valued lots 7, 8 and 9 of Homestead Add. at $70, together: they are 50 by 144 feet; lots 10 and 11, together, at $100; lots 20, 21 and 22 and 23, together with a small barn worth $50, at $400; lot 24, assessed with three others, including a greenhouse and residence, at $100 each; lots 36 and 37, cut by the railroad, together, at $50; lots 44 to 67 at $20 each; they are 50 by 112 feet; lots 68 to 73 inclusive at $20 each.

I valued the lots of block 4 in the tract 300 feet square in Nester's

Add., 6 lots facing Washington Street, at $100 each; those on Bluff St. at $20 each. I valued west 40 feet of lot 5 of block 1 of this addition at $1,700, including the building; I passed my judgment on that personally. The other 10 feet of this lot, included with lot 4, I valued with the building, at $1,200.

I would value the tract of 4.09 acres at $7,500; I figure the acreage adjacent to the lots at $200 an acre. There are 15 lots, at $300 a lot; I only figured 13, and I figured the remaining two acres at $200 an acre—$4,500 plus $400, a total of $4,900.

I valued the 3.56 acre tract, immediately south, and the 7.15 acres south of that, at $180 an acre. I would value description 32, 5.16 acres, at 200 per lot, for 90 lots.

In my valuations above, and of railroad property generally, I took conditions as they were; the use to which the property might be put was not considered, to any extent. I arrived at my values
1086 by applying the value of nearby and adjoining property. I valued the two acres south of the lots on Washington St. at $200 an acre, simply as acreage property. I assumed a valuation for 70 acre tract, and then applied that acreage value to everything except what lay on Washington St., considering the location.

As to a bona fide offer of $2,700 for lot 5 in block 1 of Nester's Add., I valued it at $1,700, cash value; I have known of such changes in six months or a year.

In block 3 of Harlow's Add. No. 21, on Washington St., I valued lot 1, without improvements, at $100 per front foot; it is 50 feet front and 90 feet deep, across from the post office; I would run the rest of the block at $75 per foot. In the next block west, I would put lot 1 at $75 per foot and the balance at $50, to Fifth St. On Harlow's Add. No. 2, there were some old buildings of practically no value; I valued that at $15,000.

I valued description 27 at $150 per foot on Front St., and at $40 per foot on Third St., running back 124 feet; $45 per foot for 326 feet facing Main St. I considered how that property could be utilized to best advantage by filling cut in Main St. and facing some of lots on that street; I included the cut in my valuation.

I judged that property on Washington St., from Front to Third Sts., was of equal value with that on Front St., south of Washington. I found out what rents were paid on the two streets; I inquired of owners or occupants, every one of them; I took every business block in Marquette. If we were not able to find the owner, we got it from the occupant, or some one that knew.

In valuing description 6, I compared it with lots 10, 11 and 12, adjoining it, farther west, across the street. I considered
1087 property on Burt & Ely Add.; I considered, generally, property in vicinity.

Property adjoining on north and east is railroad porperty; Gas Company is in that. Mr. Twiss valued the gas plant at $25,000; he valued the corporations.

I compared tract No. 8, being 12 lots between Division and Adams Sts., in John and William Burt's Add., with lots in same addition.

In valuing description 11, I considered lots in that vicinity and Penney and Vaughn's Add., and the same for description 12.

In description 18, I valued the 150 feet frontage on Spring St., including the irregular parcel across the street, at $20 per foot.

The south half of the southeast of section 10, Dead River branch, is better land than that southwesterly of it; it will bring more money, being adjacent to platted portion on north end of city, the fair ground and improved farms surrounding it in the north half of the northeast section 15. The greater value of this Dead River branch in section 10 over the land lying southwesterly of it is caused by the difference in land value between sections 15 and 10, condition of land, improvements, etc.

The south half of southeast of section 10, owned by Mr. Neidhart, I assessed and valued at $50 per acre. I began $100 valuation in lot 3, adjoining plat of north Marquette; I assessed the land at $100 per acre. I began $160 valuation in sections 2 and 11, north line; it was assessed locally at $160 per acre. I did not assess lot 5 of section 2; that is a part of Presque Isle Park.

1088 HORTON.

Redirect examination.

By Mr. Wykes:

The map I used was made in 1894. The plat in section 14, was made since then; I don't know when; it now includes Marquette Land Co. plat No. 1.

In valuing the Jopling purchase at $8,000, I considered the claim that he paid more than it was worth, because it was the only available lot, and he had to have it. I did not consider myself governed by the committee valuation, but was influenced by it somewhat. Our work in Marquette was part of a general campaign to bring assessed values in the state to cash value.

On Washington St., I put the lots in Nester's Add., a little higher than on south side of the street; that is the best side of the street; a higher and better location, and a better class of buildings.

In valuing description 32, I considered the necessity of extending Spring St. through the tract, to make those lots available; I valued it as a tract available for cutting up into lots, and placed a lot value on it.

In valuing the 4.09 acres in description 33, after taking the first row of lots on Washington street, I considered the remainder as part of a much larger tract, and my value of $180 per acre was placed accordingly; I would have put a higher value if I had considered a second tier of lots south of first tier. I would consider those lots worth $100 each. In the green part, I would not have put a higher value on the 7.15 acres if considered without regard to the entire 50 to 70 acres; I would figure the next row of lots back from the front at $50 each, and still drop off from that on the fourth row. The second row of lots would be $600 an acre.

1089 In fixing values, we took into account the location, distance from center of town, character of buildings and lands in the vicinity, and everything that should be considered. On the Dead

River branch, the values I have stated on property adjoining railroad are the prices at which we assessed it.

HORTON.

Recross-examination.

By Mr. Eldredge:

We gave the taxpayer the benefit of the doubt. Lots 3 to 7 inclusive, in Harlow's Add. No. 5, all have buildings on. I valued lot 7 and the east third of lot 6 at $500, exclusive of buildings. We figured the lots at $300 each, without improvements. Lot 15 was figured at $300, lot 16 the same, and 17 to 21 inclusive at $250 each; lots 8 to 14 were figured at $400 each, on that side of the street.

In Baldwin's Add., opposite, between Fifth and Sixth Sts. on Baraga Ave., lots 7 to 16 were figured at about $400 each; between Sixth and Seventh Sts. $400 on the corner of Seventh, and the balance at $350. Lots 54 to 59 inclusive are very poor lots. The figures I have been giving are on Rock St.; there is no lot 59 in this addition on Baraga Ave. That would be Hiram A. Burt's Add.

West of Seventh St., on the north side of Baraga Ave., in Harlow's Add. No. 5, the lots are very poor—lot 59 at $200, 58 at $100, $50 on 57, $75 each on 55 and 54. The committee's valuation on lot 54 was $50, 55 at $80 and 56 at $150; their value included building and lot, except on a few vacant lots. Lots 51 and 52 were vacant lots; on the south side of Baraga, lots 54, 55 and 57 were the only vacant lots. The Committee's valuation on lot 57 was $50, $80 on lot 55 and $50 on lot 54.

1090 In the same addition, between Sixth and Seventh Sts., lots 30 to 37, fronting on Spring St., were put in at $300 each; on lots 22 to 29 inclusive—the corner lots were placed at $400, and intermediate lots at $350. Of lots 38 to 42 inclusive, on Seventh St., between Baraga and Spring, the corner lots were figured at $300, and the lots between at $250; none were vacant. Lot 46 on Spring St. was figured at $150, and lots 47 and 48 at $100; lots 46 and 47 were vacant. The committee valued them at $90. Lot 45, also vacant, facing on Baraga, was valued at $150, lot 44 at $200, and lot 43 at $250; none vacant.

Property north of Spring, between Spring and the railroad, and between Fourth and Fifth, we valued at $20,000; we did not separate them, we included value of improvements. A portion of it is Harlow Park. My values were generally accepted by Tax Commission.

HORTON.

Redirect examination.

By Mr. Wykes:

I think there was one instance in which a reduction was made on protest. Between Baldwin's and Harlow's Add. No. 5, on Baraga Ave., it is just fair—not as good as Rock St. above. Spring St. is very poor; the houses on it front on the railroad property.

On March 26, 1914.

HORTON recalled.

Further cross-examination.

By Mr. Eldredge:

Mr. A. E. Creith did the preliminary work in John Burt's Add.; I reviewed his work. In the field notes for the whole addition, following the description of the property, appear two sets of figures; the first one represents the 1911 assessment and the second
1091 the 1912 assessment, and in another column, usually in pencil, are the Marquette committee's figures. The third column of valuations is the final price fixed by the Tax Commission.

I was thinking of J. & W. Burt's Add. Mr. Hubbard is the man who made those notes on that (John Burt Add.). I reviewed them. The notes following the *the* valuations, after each property, are Mr. Hubbard's writing.

The examiner reported lot 1 of block 1 at $4,500, and it was assessed at $4,200 by the Tax Commission. Mr. Twiss and I reviewed the examiner's figures on this plat; where we found it was a little high, we made the reduction. The blue figures are my judgment on that property, made at the time. The Commission adopted our figures in nearly every instance; where they did not, it should appear from the complaints, more than it would on the roll. Unless there has been some complaint, there would be no change.

I have no recollection, in this particular instance, why I did not adopt the examiner's valuations; it was my judgment it ought not to be any higher than it is placed there in comparison with the actual value of the surrounding property. We did not always agree with the examiner. The same examiner reported the surrounding property; I do not know whether there was any change made in that.

The memoranda showing that lot 2 of block 1 was verified at $3,500 was done by some one previous to the time we went there; the sales put on the year before by Mr. Metcalf; I don't know anything about that. That was a verification of a sale made Sept. 12, 1910, according to the record. That "verified" is misleading. The sale shows $1,500; evidently, the property was improved after the sale, *or* borrowed money—something we often find.

The record shows a verification, in red ink, for lot 6 of block 1; verified value, $2,000; purchased at $1,500. Mr. Asire veri-
1092 fied that at $2,000. My verified value in red ink cannot have reference to the verification by Mr. Asire.

"Borrowed money" means that they borrowed $1,500 on some parcel; it might have covered both parcels; I couldn't say.

Those sales were taken off and that work done before we went to Marquette. These red ink notes mean nothing, so far as my valuation is concerned. They might have influenced us some after our verification. They are not the verified sales to which I testified on my previous examination, only where we verified them ourselves.

The record of those we verified is found on the notes; very often, the verification agrees with the previous one.

I do not remember anything about lot 4, block 2. Very often, on our second examination we found conditions that the examiner did not find at the time he was present.

The record shows that lot 8 of block 2 was sold on Jan. 4, 1912, for $2,800. I assessed it at $2,600, for the reasons that many other properties were assessed—very often we find the man paid more than we consider true cash value; that is, the usual selling price under ordinary circumstances. By "true cash value" I mean the price that the property can be sold at in a reasonable length of time.

We make a distinction between cash sale and sale on time. We always inquire into these sales to ascertain whether they were sales for cash or on time. The difference we make varies with the class of property, the length of time, and the rate of interest. Very often, we find property sold on contract for 10% or 20% more than its actual worth. By "true cash value" I always mean a sale
1093 where the payment was made practically all in cash or as good as cash, at the time of the transaction.

The "vertified value $4,000" appearing in red ink, opposite lot 9 of block 2, means that one of the examiners might have placed $4,000 on it at the time Mr. Metcalf was there. The work was done in the middle of the winter, when the property was not in the shape it was in later on. These examiners were supposed to be capable of arriving at the true cash value; they were working under a disadvantage at the time, on account of weather conditions. I reviewed the property later on, when the conditions were different. None of the examiners were residents of Marquette, nor familiar with Marquette properties and values before they went there. Mr. Metcalf went a year before we did. There is a note there to the effect that our own examiner reported to us that that property was low at $4,000.

The memoranda in red ink opposite lot 23 of block 2 indicates that a sale price of $2,900 on that property was reported to me on April 9, 1912.

I assessed the property at $2,350; I considered that was all it was worth. I do not remember that instance specifically. Very often, we find a man buys on long time and gets his deed later on. Those records in red ink show the price of the contract; it shows in the deed perhaps 8 or 10 years later. It does not appear whether it is a sale on contract or not. The contract price is put in the deed sometimes five years after the sale. I am not saying that it would represent in my judgment a value five years before. If a man paid that in cash five years before, and the property and conditions remained the same, it would have some effect in showing valuation. If he paid it in cash, secured it on the property, and paid interest on it, there would be a difference according to the conditions under which he purchased it in the first place. The fact that this was
1094 reported as a sale at $2,900, and then verified at $2,900, means that the party may have paid on contract; we have no way

of knowing, without seeing the party himself, which we always do before accepting a verification.

The liber and page following the amount at which verified refers to the record in the Register of Deeds Office at the time the deed was executed. I am not saying the party did not pay $2,900; I said possibly it might have been; I do not know. We do find those circumstances in general instances where a man has bought on contract; sometimes $1,000 more than the property is worth; it goes on record, when he gets his deed, at the amount placed in the contract.

I valued lot 6 of block 3, same addition, at $7,500; the examiner valued it at $7,000. I remember the property; it is on the corner of Third and Ohio Sts.

I had a sale showing purchase price of $1,650 on lot 10 of block 3; I valued it at $1,500. I remember Mr. Begole's property at Marquette; there was no question when I valued it, nor is there now, as to whether it was valued at its true cash value.

The notes on the east 75 feet of lot 6 of block 4 show that the examiner reported that the owner said he would not sell for less than $10,000, that he had been offered $10,000, and that in the examiner's judgment it was worth $8,000. That later appeared before the Commission; the figures were fixed on account of the owner being a widow; she was given some concessions on that account. Those figures were fixed by the Commission and not by me; I couldn't say what figures I fixed; they have been erased.

I couldn't say whether it was because the owner was a woman or a widow; that was left to the local Board of Review. It was on the recommendation of the assessor that that amount was
1095 reduced. I couldn't tell in whose handwriting the word "woman" is; it is not mine.

I remember the Hargrave Flats on lots 1 and 2 of block 5, and the considerations that induced me to reduce it from $42,000 to $40,000.

I don't recall lot 9 of block 5, belonging to Annie J. Connell; the value placed upon it was not reduced because the owner was a woman.

The blue figures were the figures I reported to the Commission, except where changed by them; the exemptions for widows, etc., were on the recommendation of the local Board of Review and assessor. It has been the rule to follow their recommendation. They have a list of widows who have been partly exempted; we had access to that, and also took it up with them, to see if they still thought there ought to be the exemption.

We fixed the amount of exemption upon their recommendation; we considered what they commended, and then used our judgment. We invariably made an examination to find whether these parties were able to bear any part of the burden of taxation or not. We did not consider we had a right to exempt them in whole or in part.

Opposite lot 12 of block 7—name, John P. Kern, now dead—the value fixed by the committee is $2,500; our value is $1,500, part exempt. Our recomendation to the commission as to exemptions

for widows and other poor people was sometimes for the whole, and sometimes in part.

I cannot tell what lot 3 of block 12 of John Burt's Add. is assessed at; the description is (reading from notes, a two story upright, wing and lean-to, stone foundation, steam heat, hardwood floors, grate, hardwood finish below, 15 rooms, all modern, 1096 near car line, good, low at $4,800. The assessed valuation is $4,800; Mr. Twiss made it. Property in that neighborhood is fairly desirable property, as I remember it. We usually take into consideration, in valuing a property, the number of bath rooms it has. The examiner said the property was low at $4,800; Mr. Miller's O. K. was that $4,800 was the cash value. He is an attorney connected with the D. S. S. & A.

Mr. Miller appeared at the review in several matters, I believe. I was also present. We had already arrived at the true cash value; Mr. Miller O. K.'d it; he took the matter up with his clients, and it was agreed on at that time. I couldn't say that we reduced any values on the representation of Mr. Miller for his clients.

The examiner was Mr. Hubbard; he reported it low at $4,800 at the time he made the examination. In my judgment, it was not low at $4,800, as I remember. I don't remember that particular property now. Mr. Twiss put those figures on there.

I couldn't say whether property in that neighborhood has increased or decreased in value in the last year, or for some years prior to the time I was there; we made our valuation on the condition we found at the time. Very often, where we thought necessary, we made an examination to find what the property cost other than as noted on the report covering John Burt's Add. That record is in the field notes.

1097

Description.	Sale price verified.	Valuation or assessment.	Remarks.
Hargrove Apartments.....	.....	.....	Sale only indicated cost of lots, and all the improvements, which were the greater part of the property; were put on after the purchase.
Lot 9, block 1....	$2,500	$2,800	Verified 5 years before.
Lot 6, block 1....	2,000	2,000	Purchased 5 years before at $1500. It says borrowed money, though I couldn't say that was the purchase price; simply a record our card shows that other people verified, borrowed money at $1,500. It doesn't show the purchase price at all.
Lot 4, block 2....	1,000	1,500	Verified 4 years before.
Lot 4, block 3....	2,000	2,000	The deed called for $1; verified by the owner at $2,000. We don't take the record for it entirely; we go to the people and find out what they paid for it. Our note shows we found the purchase price to be $2,000. I guess it says "not verified"; I got it mixed.
East ½ Lot 12, block 8, and all of lot 9.....	4,000	4,300	
Lot 24, Block 8....	2,900	3,000	

We verified the price paid for the property, the conditions of the sale, etc. It has been the custom to use that word "verify" after an examination of the property and interviewing the buyer and seller or someone who knows the actual consideration. I use the word "verify" as meaning to ascertain the actual consideration. We take the sale, to locate the property and the people. It is a verification of the sale, and not the actual price alone. I don't consider myself bound by the price as showing present value; the conditions may have changed.

1098 I do not recall anything about lots 5 and 6 of block 8. The figures, $3,000, opposite, are mine. As to the statement that it was purchased in 1908 at $1,000, and verified at $1,000, that is what they paid at that time. The words "verified value, $3,600" are not my work, at all, but that of some one employed by Mr. Metcalf. That is not true throughout the report I made to the commission concerning John Burt's Add.; some of those sales were taken the year previous and verified during the winter, at the time we were there copying the rolls.

I couldn't point out the sales, the records of which were obtained by my assistants or myself, in that book. The handwriting in red ink was all by the same man. It was a matter of record before we did any examining in Marquette only some sales were verified the

year before we went there by Mr. Metcalf and his assistants; those cards were put with the sale cards we had when there, and they were all put on the book at the same time, by the same man, who knew nothing about the sales, but was simply acting as clerk.

Mr. Wykes: I don't want this record to stand, as it does, that Mr. Horton has looked through that book and given the only description where the value actually placed was either equal to or above the verified consideration, because he has not gone through the book.

Our force went there in February, 1913. In examining the sales record, we only had to cover 1912, but we investigated all the sales appearing on this book; but, in some of them, the notes were made on cards and entered here as verified by Mr. Metcalf and his assistants, and I cannot distinguish between the two from the writing. After the cards are placed on the book, sometimes they are sent back and sometimes not. They are simply taken on the cards to
1099 get them off the records, on to our field books.

(Witness testifies as to various descriptions, sales as reported, verified value, verified sale, and valuation and assessment of same, as follows:)

1100

Description.	Sale as reported.	Verified. Value.	Verified. Sale.	Present valuation by— Owner.	Present valuation by— Metcalf.	Present valuation by— Our force.	Assessment.	Remarks.
Lot 2, Blk. 1, J. Burt's Add.	$1,500 in 1910.	$3,500 by our force.	.....	.....	.....	.....	$2,700	Bought 3 years ago on contract.
Lots 4-5, Blk. 1.....	.....	.....	.....	.....	.....	.....	.....	No bearing on value.
Lot 6, Blk. 1.....	.....	.....	.....	.....	.....	.....	.....	Already testified as to that.
Lot 9, Blk. 1.....	.....	.....	.....	.....	.....	.....	.....	Ditto.
Lot 16, Blk. 1.....	.....	.....	.....	.....	.....	.....	.....	No tendency to determine present value.
Lot 4, Blk. 2.....	.....	.....	.....	.....	.....	.....	.....	Already testified as to that.
Lot 7, Blk. 2.....	$1,500 on Dec. 1, 1911.	.....	.....	.....	$3,500	.....	.....	Clerk wrote "verified" when he should have put value only. I think that is examiner's opinion as to value. Combining that examination and ours, it is misleading. The notes in red ink are sometimes misleading.
Lot 8, Blk. 2.....	Sale in 1910; $2,800 in 1912.	.....	.....	.....	.....	$2,600	.....	
Lot 9, Blk. 2.....	.....	.....	.....	.....	.....	.....	$3,500	Lot alone cost $1,275 in 1908. Our examiner reported the premises low at $4,000 in 1913.
Lot 23, Blk. 2.....	$2,900 in 1912.	.....	.....	.....	.....	.....	$2,350	

Description.	Sale as reported.	Verified. Value.	Verified. Sale.	Present valuation by— Owner.	Present valuation by— Metcalf.	Present valuation by— Our force.	Assessment.	Remarks.
Next sale	$1	.....	.....	.....	.....	.....	.....	Not able to verify.
1101								
Next sale	$1 in 1909.	.....	.....	.....	.....	.....	.....	Notes in red show verified at $2,900; in my judgment, this is value examiner under Metcalf found. I couldn't say whether it shows sale at that price.
Next sale	$1,000 in 1912.	.....	.....	$2,850 verified.	.....	.....	$2,500	
Lot 8, Blk 5.....	$1,825 in 1908.	.....	.....	.....	.....	.....	.....	Improvements made since then.
Next sale	$2,100 on Sept. 11, 1910.	.....	.....	.....	.....	.....	$1,800	
Lot 9, Blk. 5.....	$1 in 1909.	.....	$2,800 by Metcalf force.	.....	$4,000	$4,500 by our examiner.	$3,900	Assessed after more thorough examination.
Lot 11, Blk. 5.....	$2,450 in 1912.	.....	.....	.....	.....	.....	$1,800	
Lots 19-20, Blk. 5.....	$1,650 in 1910.	.....	.....	.....	.....	.....	$2,500	There must have been improvements after purchase.

Description.	Sale as reported.	Verified. Value.	Verified. Sale.	Present valuation by— Owner.	Present valuation by— Metcalf.	Present valuation by— Our force.	Assessment.	Remarks.
Lot 1, Blk. 6.....	$2,000 on April 27, 1911.	.....	.....	.....	.....	.....	$2,000	
Next sale	$3,500 on Sept. 28, 1911.	.....	.....	.....	.....	.....	$2,900	
Lot 7, Blk. 6.....	$3,500 in 1908.	.....	.....	$3,500	$3,000	$3,000	.....	
Lots 1-7, Blk. 6.....	.....	.....	.....	.....	.....	.....	.....	No tendency to show present value.
1102 Lot 10, Blk. 7.....	$2,600 on June 14, 1912.	.....	$2,600	.....	.....	.....	$2,800	Our examiner reported about $800 in improvements since sale. The assessment was after $1 sale; property deeded for $1 and money borrowed to make improvements. The $2,600 sale after improvements made.
W. 37½ ft. E. ½ Lot 10, Blk. 7.	$2,400 in 1907.	.....	.....	.....	.....	.....	$2,000	
Lot 15, Blk. 7.....	.....	.....	.....	.....	.....	.....	.....	$2,500 borrowed money; no tendency to show value.
Lot 3, Blk. 8.....	.....	.....	.....	.....	.....	.....	.....	Ditto.
Lots 5-6, Blk. 8.....	Sale in 1906.	.....	.....	.....	.....	.....	.....	"
Lot 7, Blk. 8.....	Ditto 1909.	.....	.....	.....	.....	.....	.....	Vacant lot.

Description.	Sale as reported.	Verified.		Present valuation by—			Assessment.	Remarks.
		Value.	Sale.	Owner.	Metcalf.	Our force.		
Lots 12-9, Blk 8.....	$4,000 on Sept. 26, 1908.	.....	.....	.....	.....	$4,300	.....	
W. ½ lot 13 and E. ½ lot 16, Blk. 8.	$3,200 in 1909.	.....	.....	.....	.....	.....	$2,500	
Next sale	$3,000 on Feb. 28, 1912.	.....	.....	.....	.....	.....	.....	
Lot 22, Blk. 8.....	$2,800 in 1912.	.....	.....	.....	.....	$2,400	.....	
Lot 24, Blk. 8.....	$2,900	.....	.....	.....	.....	$3,000	.....	
Lot 1, Blk. 9.....	$1,800 on April 30, 1908.	.....	.....	.....	.....	.....	$1,800	
1103								
Lot 8, Blk. 9	$2,000 on Dec. 28, 1908.	$3,000 by Metcalf's force in 1912.	$3,500 by Metcalf's force.	.....	$3,000	$3,300	$3,300	Metcalf's force found it worth $3,000 in Dec., 1912. We valued property at $3,300 at the time we made our examination, Mar. to May, 1913.
Lot 9, Blk 9	$1,000 on April 7, 1908.	.....	.....	.....	$2,750	.....	$2,700	
Part Lot 1, lying west of E. line of lot 3 produced, and Lot 3, Blk. 10.	$6,000 on Sept. 1, 1908.	.....	.....	$6,000	$5,000	$4,200	$4,200	Our value at time of examination. Notes as to $6,000 valuation by owner were made by Metcalf force.

Description.	Sale as reported.	Verified. Value.	Verified. Sale.	Present valuation by— Owner.	Present valuation by— Metcalf.	Present valuation by— Our force.	Assessment.	Remarks.
Lot 3 and 5 ft. of Lot 4, Blk. 11.	$6,000 on Sept. 23, 1910.	.....	$5,750	.....	.....	.....	$5,500	Assessment based on terms of sale.
W. ½ Lot 12 and E. 12 ft. Lot 12, Blk. 11.	$2,000 on Feb. 26, 1908.	.....	.....	.....	.....	.....	$2,300	
W. 37½ ft. N. 85 ft. Lots 17-18, Blk. 11.	$1,650 on Sept. 24, 1908.	.....	$1,650 by Metcalf.	.....	.....	$1,600	.....	
W. 17 ft. Lot 5 and E. 32 ft. Lots 6-7, Blk. 12.	$3,500 on Aug. 24, 1910.	.....	$3,500	.....	.....	.....	$3,500	
Sale in Blaker & Bacon's Subdivision.	$3,000 on Dec. 20, 1909.	.....	.....	.....	.....	.....	$3,500	A part of John Burt's Add., I think.

1104 I made the examination of Harlow's Additions 1, 2 and 3 inclusive; the notes are all mine, except verifications carried over from cards, through the entire book. The sales appearing in red ink and those made prior to the fall of 1911 were verified by Mr. Metcalf's men during the winter of 1911.

Harlow's Add. No. 5 was examined by F. E. Bush, and the work approved by myself. Lots 1, 2 and 3 of Nester's Add. No. 1, were examined by both Mr. Twiss and myself. We did not follow the committee's valuations in all cases.

(Report covering Harlow's Additions 1, 2 and 3, pages 71 to 83 inclusive, offered in evidence and marked Complt.'s Ex. 90, Horton, March 27, 1914; also report covering Harlow's Add. No. 5 offered in evidence and marked Complt.'s Ex. 91, Horton, March 27, 1911; also report covering Nester's Add. No. 1 offered in evidence and marked Complt.'s Ex. 92, Horton, March 27, 1914.) (Objection by Mr. Wykes so far as they are not lands nearby or adjacent to the railroad, and not shown to be such.)

Yesterday, the values I placed upon certain lots, separate from improvements, in Harlow's Additions 1, 2, 3 and 5 were from memory and my having access to the maps of that plat accompanying the record. The map accompanying Complt.'s Ex. 90, Horton, which covers Harlow's Additions 1, 2 and 3, is supposed to be a map of the plat of those additions cut from a map of the city of Marquette compiled by E. A. Johnson and J. S. McCarthy, dated in 1894; I think they are the same.

The map refers back to the location and time I did the work; it only refreshes my memory. That is not true of Complt.'s Ex. 92, Horton, Nester's Add.; but values are given there in the majority of cases. An inspection of the exhibit will show those values
1105 separately, wherever they are given. In Harlow's Add. No. 5, where the notes show improvements on the lot, I rely upon memory for the value. There are also vacant lots listed there.

HORTON.

Redirect examination.

By Mr. Wykes:

(Board's record of field notes and assessments on John Burt's Add. marked Defts.' Ex. 51, Horton, March 27, 1914.) On that exhibit the second column shows the committee's valuation in dollars; the third column, in blue pencil, is the Commission's figures; that is, our recommendation as to the value of that property as adopted by the Commission. Where the Board did not adopt our figures, they were changed to correspond with the value agreed upon by the Board, so this record would not entirely show our recommendation in those instances. This exhibit was made previous to the assessment roll, and is the data upon which the official roll was made up.

The local assessors still make their assessment roll, in which they

place their estimate of the value of property; these exhibits are parts of a roll prepared by, or under the direction of, the Tax Commission, and the changes made by the Commission in the local valuation are put on the local rolls, in a column provided for them; with that exception, each valuation is carried out by the Commission, whether there is a change or not.

I find among the Commission's records seven protests against high valuations in John Burt's Add., nine in the Harlow Additions, and 62 in Marquette city, entire. I find a protest for the corner of Front and Baraga, by Mr. O'Meara; also for the northwest corner of Front and Washington.

Between two men, assumed to be equally competent, valuing a piece of property independently for the same purpose, I
1106 wouldn't consider a difference of 10% between them unusual. I would regard as unusual a variation in values from $10,500 to $39,000 for the same property.

There were building- on the lots in John Burt's Add., as a rule, and in fixing our values, the condition of the buildings was always taken into account. Assuming a sale in 1908 and a valuation in 1912 or 1913, without repairs, I would not regard the building worth as much in 1913 as in 1908. Assuming the ordinary repairs, painting, etc., it might be worth as much, and might not. I recall no peculiar conditions relative to valuations in John Burt's Add.

I couldn't say whether I investigated to see whether land had increased or decreased in that particular addition. Taking into account the things called to my attention by Mr. Eldredge, there is nothing that would lead me to change my judgment on the plat as a whole.

The field man's work was done in Marquette during March and the first of April; my work was done in May. May would be the better time to make a complete inspection and examination in that section of the country, where the snow hinders more or less.

HORTON.

Recross-examination.

By Mr. Eldredge:

Of the seven protests in John Burt's Add., five were over-ruled by the Board; in one instance, they reduced to $2,500 a property which we recommended at $2,700; and in another, from $2,500 to $1,500, part exempt, on the recommendation of Mr. Primeau, City Assessor; that is, they exempted a part of the value I had included. The reasons for making the complaint, are that the owner is a widow; owns another house, that rents for $16 a month; owes $550; son
1107 and daughter at home pay board. Board of Review reduced value because of circumstances.

Of the 62 protests in Marquette, two of them related to personal property; one of them is marked no protest, and the other is marked assessed at $65,000.

1108 On March 25, 1914.

FESTUS R. METCALF, a witness called by defendant.

Direct examination.

By Mr. Wykes:

I live in Adrian; I am 66 years old. I am in the service of State Board of Tax Commissioners, and have been for 10 years. My work at present is mostly corporation valuation. I have done all kinds of work for the Tax Commission; I started with farm work, but have been doing nothing but business, city and village property for four or five years; almost exclusively on corporation work the last two years. When I view business property in a city, the foreman usually works with me; that is, foreman of a force of field men; with corporation property, I work alone.

I did no re-assesment work in Baraga. Two or three years ago, I had a force of six men doing preliminary work in Marquette. This was additional to work done by Mr. Horton. The local committee was appointed while I was there, and the Commission had me examine and verify all sales made in the two years, and use it as supplemental to their work; I put no figures on property that year.

When I go to a place to value property, I first get the judgment of the people who live there. We have used sales to verify our judgment, but the general consensus of opinion of people dealing in real estate fixes the value of it, taking into account bids, offers, sales, etc.

The first I knew I was to testify in this case was about two weeks ago.

METCALF.

Cross-examination.

By Mr. Eldredge:

There is no secrecy about our work when we go into a town to begin valuation work; everybody knows we are trying to find valua-
1109 tions for taxation purposes. In my experience, public opinion is the strongest factor in establishing land values; that is the opinion of those who own and buy and sell.

METCALF.

Redirect examination.

By Mr. Wykes:

I get the expression of that opinion in part from actual sales; also bids and offers.

1110 On March 25, 1914.

J. R. DAVIS, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I live in Lansing; I did live in Bay City; I am 40 years old. I have been with Tax Commission for 10 years; left them in January, 1914. I was employed by Tax Commission for four years, at general office work and assisting some on outside, part of the time; next two years as a clerk on field work, and part as examiner, and the past four years as examiner; on outside work exclusively for three years.

In examining property, I placed valuation on it. My first work in placing values was in Grand Rapids about eight years ago, on equalization work, assisting Mr. Parker; that was getting data to give to State Board of Equalization. Three or four years ago, I worked in Charlevoix County, assessed Boyne City, and assisted as examiner in general work through the county. I also did some readjusting of valuations in townships; that would involve finding the cash value of the different districts. Two years ago, 1912, I worked in Ironwood; made examination there with Messrs. Horton, Hubbard and Mansfield. I also worked in Bessemer, Iron River, Iron Mountain; then, in Jan. 1913, Marquette County appraisal, assisted by Messrs. Keith and Hubbard.

I went to Marquette County in April; I assisted in Marquette city, and worked between Negaunee and Ishpeming and other points in the county until the latter part of August. Mr. Hubbard and Mr. Keith were with me all the time. In our work of reaching values for assessments, we gathered what sales we could, interviewing the people, in general, and endeavoring to find out what we considered a true basis of value. I got my information largely from business men, but discriminated against no one, and met anyone interested and intelli-

1111 gent on these matters. Our purpose throughout the work in Ishpeming and Negaunee was to reach true cash values.

My work had to do with surface values only; I did not take in mineral values. I have not checked the few differences between the figures I recommended and those that went on the assessment roll.

Beginning at the east line of Negaunee, the figures placed on the assessment rolls by the Tax Commission from my examination are: westerly through the S. W. ¼ of Sec. 33-48-26, $12 an acre; through the S. E. ¼ of Sec. 5-47-26, $25 an acre; N. W. ¼ of Sec. 5, $800 per acre; N. E. ¼ of Sec. 6, $2,000 per acre; N. E. of S. W. of 6, $2,500 per acre; N. W. of S. W. of 6, $7,000 per acre (that refers to both sides of track); S. E. of N. E. and N. E. of S. E. of Sec. 1-48-26, $1,000 per acre; northwesterly through balance of Sec. 1, $40 per acre; S. W. of S. W. of 32-48-27, $40 per acre; I think that carries you to the west line of city of Negaunee; the business part of Negaunee is in the N. W. of S. W. of Sec. 6-47-26, at $7,000 per acre.

From we t line of Negaunee the figures through the S. ½ of S. E. of Sec. 2-47-27 are $75 per acre; S. ½ of S. W. of 2, $35 per acre; S. E. of S. E. of 3, $300 per acre; S. W. of S. E. of 3, $2,000 per acre; N. E. of N. W. of 10, $8,000 per acre (practically in center of Ishpeming); N. W. of N. W. and S. W. of N. W. of 10, $2,000; S. E. of N. E. of 9, $200 per acre; N. W. of S. E. of 9, $35 per acre; S. W. of S. E. of 9, $135 per acre; and balance of Sec. 9, to west line of Ishpeming, $40 per acre. That is as far as I went through; further on are figures taken from assessment roll.

The figures up to this point are the result of my work, assisted by Mr. Keith and Mr. Hubbard, and they were my judgment of the true cash value at the time reported and now.

1112 No surface value was taken at Champion; that is a mining proposition, solely, and was assessed as such. I can give no separate values there, except as to my judgment of the values of property.

At the time I made these figures, I had no intimation that I might be called upon to testify in this case; I first learned that I should testify about a month ago.

Of the lots and assessments that went into the $7,000 area in Negaunee, the land value, from lot 1 on north side of Iron St. to intersection of C. & N. W. railroad, is $100 to $150 a foot. These lots are 33 by 130; they face two streets,—that is, they extend through to an improved street,—so that they have two building sites frontage. I think it was the values between there and the railroad that fixed the $8,000 value. On the south side of Iron St., from Gold St. easterly to intersection of C. & N. W. road, the lots would average about $100 per front foot. From the C. & N. W. tracks, on south side of Iron St., to Pioneer Ave., the lots directly across from those $150-a-foot lots ran from $75 to $95 a foot.

On March 27, 1914.

DAVIS, recalled.

Further direct examination.

By Mr. Wykes:

The figures I gave you were my average of the assessed values in those districts along the line of the railroad. They were not exact mathematical averages; I just applied my judgment on the territory as I went through. I took the assessments on both sides of the right of way. The figures would be the average value according to my judgment; it would, in a way, be my average of the assessments. In other words, my judgment of the value and the valuation of the assessments were practically the same.

1113 As to the property north of the railroad, in the vicinity of Iron St., at Negaunee, on the east side of Gold St., there are three lots back of the south side of the main business part; on the west side, two lots, fronting differently; on the west side of Silver St., four lots; and on the east side, five lots, running parallel with the

alley, facing Silver St., and between that and the C. & N. W. tracks; on the west side of Marquette St., five lots, and on the east side, four lots. The four lots would be about four and a half regular lots, as lot 65 is a wide lot. At Pioneer or Division St., there are three lots on the west side; the east side is taken by the city fire department block. That is the east end of the business district. On the east side of Silver St. are four or five lots that run into a corner 210 feet on Silver St. and 200 feet on the railroad, about .48 of an acre.

I verified the Winter & Suess sale, on that, at $2,200. There was a peculiar condition in that sale, which I might explain. The gentlemen buying the property supposed they were buying lots 45 and 74 to 78 inclusive, which would make the complete property between Silver St. on the west, the C. & N. W. right of way on the east, and the D. S. S. & A. on the south, but, when they came to record their deed, it did not include lot 45, a very small "v" shaped lot close to Iron St., but with no outlet on it, and they were forced to pay $300 for this lot, to complete the property, making the total paid $2,500, including the point.

There is no business south of the railroad in that immediate vicinity, except on the extreme east end of the property we have been describing; that is Pioneer Ave. as continued.

The assessments on the land south of the track would average about $400 per lot; a little less directly south from the section line of 1 and 6 to the west ⅛ line of 6. It would be a tier of lots on the
1114 east side of Gold St. and then easterly through to Silver, Peninsula and Bay de Noquet, and Division or Pioneer Ave. extended.

I found the highest values in Negaunee on the north side of Iron St., between Pioneer Ave. on the east and the C. & N. W. right of way on the west.

DAVIS.

Cross-examination.

By Mr. Eldredge:

The value on lots 61, 62, 63 and 64 of the Pendell plat is $40 per foot frontage; they front on Division St.; that is a continuation of Pioneer Ave.—a narrow street. They are 105 foot front on Division St. and 100 feet deep. Lot 64 is smaller; I think it only has about six feet on Division St., so that 10,125 feet area is nearer right than 10,500 feet. The valuation of that property was $4,000. That 10,125 square feet would amount to $17,205 an acre, we figured.

I cannot give the original size of lot 105, on the east side of Gold St., immediately south of the D. S. S. & A. It is apparently all taken up by the railroad, here, on the map, and what part was not taken up by the railroad was used as a driveway on the south side. It was assessed at $300. My notes on it read: "Is vacant and used as a driveway." I assessed it as a lot, as I saw it, $300.

I assessed lot 108 on Silver St. at $300; as I remember, it was cut on the northeast corner by the railroad. My value was on the portion

outside of the railroad; I don't know how much. These lots are 50 by 150 feet. I assessed lot 119 on east side of Silver St. at $300 for that part south of the railroad; I do not know how much it was. Maitland's Add. was in existence then. I assessed lot 1 of lock 2, there, at $1,000; lot 15 at $600. Lot 1 is 50 by 120 feet; lot 15 is 51.55 by 120 feet.

1115 I assessed lots 1 to 7 inclusive of block 29 of the Pioneer Add. for $1,800, as an entirety. Lots 4, 5, 6 and 7 were about six feet below the street line—a garden spot; lots 1, 2 and 3 faced the railroad on the south—very rocky. There was some personal property on those lands, small cottages and shacks, scattered along the railroad. I don't remember of any rock blasting going on in lots 1, 2 and 3; I think that was further west, on blocks 17, 18, 28 and 29. The entire south part of block 29, between Healy Ave. on the east and Brown Ave. on the west, is a bluff.

(Map of Negaunee offered in evidence and marked Complt.'s Ex. 93, Davis. Mr. Wykes admitted that red line in map marks southerly limit of D. S. S. & A. through Pendell Plat.)

Lots 1 to 17 inclusive—that is, the entire south side of block 28,—is rock bluff. The city has a stone crusher on lots 4 and 5. Lots 1 to 9 inclusive, the south side of block 17, are all very narrow lots; they might run into the bluff on the east side; part of that was used for gravel pit. The property of D. S. S. & A. in front of blocks 17, 28 and 29 was assessed at $275 an acre; I valued it at that.

I found a small part of the D. S. S. & A., immediately south of Lots 4, 5, 6 and 7, and perhaps lot 3, of block 29 of the Pioneer Add., had been abandoned. I valued the land between that abandoned right of way and the new, south of it—that is, between the Maitland and Reed & Winters Additions and the present right of way,—at $5,000; that is for the entire; that includes land both north and south of the present right of way between Healy Ave. and the Maas & Lonsdorf Add. For south of the track, the description reads: That part of the S. ½ of the N. E. ¼ lying south of main line of M. H. & O. railway west of west line of Maas, Lonsdorf & Mitchell Add. of Negaunee, and east of the extension of Healy Ave. continued. That is 10 acres, there.

1116 I valued the right of way across the N. W. of the S. E. of Sec. 33-48-26 at $10 an acre; N. E. of S. W., $10 per acre; S. E. of S. W. $12 per acre; and S. W. of S. W., $12 per acre. The next 40 on that (south) line would be the S. E. of S. E. of Sec. 32, at $30 an acre; the entire S. ½ of S. ½ of S. E. is set at $30 an acre. These figures represent the present value of this right of way, in my judgment.

In Sec. 5-47-26, I value the N. E. of N. E. at $15, N. W. of N. E. at $15, S. W. of N. E. at $40, and S. E. of N. W. at $800 per acre. I made my examination, on which I based these prices, in the summer of 1913. I knew this right of way had been recently purchased, but had never investigated it. I don't remember any sales in Sec. 5. As to this sale for railroad purposes, I knew nothing about it, and made no effort to find out.

As to this land just valued at $10 per acre, it is a question as to for what purpose it would be worth that; part of it was rough cleared. I valued the lands that the right of way runs through—approximately the same kind of lands; not the right of way itself.

In Sec. 5, the Pioneer & Arctic Iron Co. owns the S. W. of N. E.; the S. E. of N. W. is all cut up in small descriptions.

The land I valued at $800 an acre is pretty fair land, with good building spots, valuable for lot purposes. The land I valued at $40 an acre was mostly unimproved, some stumps and stone; fair land; the balance was cut up by railroad and swamp. There are about 12 acres in that 40 of no value except for railroad use. I valued that 12 acres at $80 an acre.

On the south line (of 48-26), I valued the S. E. of S. E. of Sec. 33, at $10, S. W. of S. E. at $10, and S. E. of S. W. at $12, per acre.

In sec. 4-47-26, I valued the N. E. of N. W. at $10, N. W. of
1117 N. W. at $10, and S. W. of N. W. at $10, per acre.

In section 5-47-26, I valued the S. W. of N. E. at $40, on an average, S. E. of N. E. at $12, N. W. of S. E. at $20, and N. E. of S. W. at $800, per acre. I don't think I valued the S. E. of S. W.; I think that is a mine; it is assessed as a mine. I think the surface rights were not assessed. I think that is a part of the Queen group of mines; there is no assessment on that, except as a mine. I valued that part of the S. W. of the S. W. lying south of the main track of the C. & N. W., except the L. S. & I. right of way, at $50 an acre.

I assessed lot 82 of the Iron or Pendell plat, separately, at $1,500; it has 45 feet frontage on Silver St. I assessed lots 83 and 84, together at $60 per front foot for the lots; lot 39 at $125, and lot 40 at $100, per front foot. Those two lots were assessed against Benjamin Neeley. They had buildings on them. Lot 39 had 33 feet frontage on Iron St., I think, and lot 49 the same. I assessed the entire property at $20,000.

I assessed lot 87 at $1,200, lot value—I couldn't answer as to its frontage. Lot 86 at $60 per front foot for 33 feet; that is on the west side of Gold St. Lot 87 has about 22 feet frontage on Gold St., I think; I didn't think the value was as good there.

DAVIS.

Redirect examination.

By Mr. Wykes:

I assessed the business district by the front foot; the larger tracts south of the railroad track as lot value.

At Ishpeming, I placed an average valuation outside the right of way between Third and Lake Sts., with the exception of a
1118 certain tract in the center, at $8,000 an acre. The tract in the center, between First and Pine Sts., would be worth $12,000 an acre.

As to lots adjacent to the railroad track in that neighborhood, I valued lot 124, the first lot south of the railroad, on First St., at $45 per front foot. There is no lot 125; it is a street. Lot 116 is railroad

property; no assessments on that. Lot 117 belongs to the city; no assessment on that. Lot 118, the same. Lot 119 at $40 a front foot.

Lots 120, 121 and 122 are divided the other way, with frontage on Cleveland Ave., at $60 per front foot, 105 feet deep. I assessed those lots. Lots 120, 121 and east 35 feet of lot 122 are assessed to the Upper Pensinsula Brewing Co.; east 35 feet of west 70 is assessed to Crowley; west 35 feet is assessed to Mine Workers Union. Lot 114 faces Main St.; value $150 per front foot. Lots 113 and 112 at same price.

Lot 111, adjoining the railroad, is assessed at $100 per front foot; it is given as a metes and bounds description with a frontage on Main St.; amount of frontage not given. I assessed it as 35 feet frontage; total, $3,500. I paced it off. There might be a difference as to where the line came in that right of way.

The Assessed values from the west limits of Marquette to the east limits of Negaunee (north line) are as follows:

From	West Line of Marquette			to	Mile Post	157,	$50.00	per	acre.
"	Mile	Post	157	"	"	158,	20.00	"	"
"	"	"	158	"	"	159,	15.00	"	"
"	"	"	159	"	"	160,	5.00	"	"
"	"	"	160	"	"	161,	3.50	"	"
"	"	"	161	"	"	162,	4.00	"	"
"	"	"	162	"	"	163,	6.00	"	"
"	"	"	163 to East Line of Negaunee,				6.00	"	"

1119 On the south line, they are:

From	West Limits of Marquette			to	Mile Post	4,	$10.00	per	acre.
"	Mile	Post	4						
"	"	"	5	"	"	6,	5.00	"	"
"	"	"	6	"	"	7,	4.00	"	"
"	"	"	7	"	"	8,	4.00	"	"
"	"	"	8	"	"	9,	5.00	"	"
"	"	"	9 to East line of Negaunee,				8.00	"	"

These are the assessments on each side reduced to the acreage assessment, extending 80 rods on either side, across the first 40 on either side of the track.

The assessed values per acre on lands each side of the road, from the west limits of Ishpeming to Baraga County line, are:

Mile post. From—	To—	Value per acre.	Remarks.
172	173	$8.00	
173	174	7.00	
174	175	5.00	
175	176	5.00	
176	177	5.00	
Low Moor Farm		12.50	
177	178	7.00	
178	179	5.00	
179	180	7.00	
180	181	5.00	
181	182	15.00	Humboldt
182	183	7.00	
183	184	5.00	
184	185	5.00	
185	186	32.00	Champion
186	187		Champion Mine
187	188	5.00	
188	189	3.00	
189	190	4.00	
190	191	3.00	
191	192	3.00	

The figures I have given are Tax Commission figures; they were taken from the field books of the Board of Assessors. These figures were on the bare land. I couldn't say whether there were no
1120 structures, or whether there were some and they were excluded. There is a possible chance that those figures were changed. I cannot say that the figures on the field books are the figures placed on the assessment rolls.

Mr. Eldredge: The figures of witness may stand as the Tax Commission valuation, but I do not waive my objection to the competency of Tax Commission valuations to prove the true value of the land.

DAVIS.

Recross-examination.

By Mr. Eldredge:

I valued the lots on Church St. lying immediately north of the north line of D. S. S. & A., just west of First St., exclusive of improvements, at $35 a front foot; that covers all the lots on the south side of Church St., between Main and First Sts.

Lots 1, 2 and 3 of block 2, fronting on Main St., valued at $80 per front foot. This value includes lot 4, also. They were laid out originally facing Canda St.

From First St., on the west to Pine St., I placed an average value

of $12,000 an acre, and from First St. east to Third St., $8,000 an acre. I would value the land occupied by the D. S. S. & A. passenger and freight station, terminals and right of way between those two points at $8,000 per acre.

I valued lots 133, 134, 135 and 136, on Second St., sold to the Government for a post office site, at $35 a front foot, exclusive of buildings. My total valuation on the four lots was $6,000, and $3,000 on the buildings, making $9,000 on the property.

1121 In getting at my average of $8,000 in Ishpeming, I used the values on and adjacent to the railroad, abutting on it.

I valued lot 145 on the opposite side of Second St., at $25 per front foot; it is lower than on the other side.

DAVIS.

Redirect examination.

By Mr. Wykes:

The frontage on Main St., immediately north of the railroad and corner of Canda St., runs back across lots 1, 2, 3 and 4; that is the depth of these lots. I mean that these lots west of Main St. on the north side of Canda Street, which were originally platted to face Canda St., front on Main St., and run back the entire length of the four lots.

Back of these lots are lots 5 and 6, facing on Canda St. and continuing through to Pine St.; I placed $1,200 on lot 5 and $800 on lot 6. They are all 40 foot lots, fronting Canda St.

In block 3, I valued lot 1 at $1,000, lot 2 at $900, lot 3 at $900, lot 4 at $800, and lot 5 at $800. The lots are 40 by 120 feet, for all the lots fronting on Canda St., as far as Pine St., which is the next street west of Main.

The highest frontage price I fixed in Ishpeming was $200 a foot, on lot 75 of the original plat on the corner of Front and Main Sts. I fixed lot 81 at $175, lot 82 at $125, and lot 76 at $150 per front foot.

As to my valuation on lots on the south side of the railroad lands at Negaunee, I did not know exactly where the railroad line was, so I made an average valuation of $300 per entire lot, treating the lots where the road runs through and the lots adjoining those the same.

1122 I did not try to find where the railroad line actually was or how much of the lots the railroad used, and where there was a very small corner outside the right of way, as in lot 105, I did not intend to apply the $300 value there.

On April 25, 1914.

DAVIS recalled.

Further direct examination.

By Mr. Wykes:

In addition to those which I gave before, I have taken from the field notes of the Tax Commission certain of the average values fixed for assessment from the Alger County line to the east limits of the city of Marquette, through Marquette county, and have set them down in a table.

(Mr. Eldredge objects to the testimony because it has no tendency to show the value of the lands, is not competent, and because it allows no opportunity to show the truth in rebuttal, as it proposes to give averages.)

From the Alger County line to mile post 150, not including any of the additions around Chocolay, the average value per acre was $2.81. These figures were prepared for the tax roll by the State Board of Tax Commissioners in 1913.

From mile post 151 to mile post 151.92, the east limits of the city of Marquette, the average value was $5.32 an acre. I have not included from mile post 150 to mile post 151. That was the plat of Lakewood, which I did not take. I have a copy of the figures from which these averages were computed; that is the assessments and the descriptions by the Tax Commission.

(Witness handed detail figures to Mr. Eldredge for the purpose of cross-examination. Mr. Wykes stated that he has introduced simply the computation of the average, to save putting in each detailed description and each price.)

1123 (Mr. Wykes produced a duly certified copy of the Articles of Consolidation of the companies forming the D. S. S. & A. Ry. Co., which is marked Defts.' Ex. 54; also a duly certified copy of the Articles of Consolidation of the companies forming the M. H. & O. R. R. Co., which is marked Defts.' Ex. 55; also duly certified copies of the following Articles of Consolidation: M. H. & O. R. R. Co., marked Defts.' Ex. 56, Houghton & L'Anse R. R. Co., marked Defts.' Ex. 57, Bay De Noquet & Marquette R. R. Co., marked Defts.' Ex. 58, and M. & O., marked Defts.' Ex. 59. He also produced a duly certified copy of the various contracts and records of the State Board of Control of State Swamp Lands, which is marked Defts.' Ex. 60.)

1124 On March 26, 1914.

FRED M. TWISS, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I live in Lansing; have lived there since 1899. At present, my official title is Chief Examiner of the Board of State Tax Commissioners in Michigan; have been such for three or four years. I was the first secretary of the State Board of Tax Commissioners, under the act of 1899, and held the place until Governor Bliss was inaugurated and a partial change took place in the Board. Since then, my duties have been the personal examination of property in the state liable to taxation under the general tax law and the supervision of men engaged in that work, when not actually engaged in making personal inspections. My entire time has been spent in that work. I have no other employment.

I have valued property in many counties and cities (naming nine cities of the state in which he worked). In these, I personally examined and valued properties for purposes of assessment or state equalization, and have superintended and examined the work of our field men in other districts. At present, I am in charge of the Tax Commission force engaged in ascertaining the value of Wayne County, including Detroit, for state equalization purposes. Since my first connection with the Board, I think the tendency of assessed values has been upward. Within the last year or two, the purpose has been to put property in the rolls at cash value.

The work in Marquette was as described by Mr. Horton. I was there while the active field work was being carried on—six weeks, altogether. Several years previous to that, I examined property there. I made an examination of South Shore, at Marquette, with special attention to valuing it, three years ago, I would say; it might have been early in 1912. Outside of the cities in which we re-
assessed property, I have a general knowledge of Upper Penin-
1125 sula land along the South Shore, and I think of all rural lands in the Upper Peninsula.

Referring to Complt.'s Ex. 1*b*, Riggs, I cannot place value on description 3 from personal inspection. Description 6, I value *as* $200 per lot. In description 8, I would value the lots at $100 per lot; in description 9, $100 per acre to cemetery and $25 per acre from there to city limits. In description 11, $9 per foot on Lake St.; in description 12, lots 41, 42, 43 and 44 at $250 each; lot 1, east half of lot 31 and lot 32 at $250 each; and lots 69 to 74 inclusive at $200 each.

I consider lots 41, 42, 43, 44, 1, east half of 31, and 32, facing on Genesee street, worth $50 per lot more than those facing on Mesnard St.

In description 13, I place $15 per foot for frontage on Lake St.,

and add $500 for the land in the rear—200 feet from Lake St. and facing Jackson St. In description 15, I value the corner of Baraga and Front Sts. at $90 per foot on Front St.; in description 16, $15 per front foot; in description 17, $30 per front foot, as average value; in description 18, $20 per front foot, on average; in description 24, $150 per front foot on east and west side of Front St., north of Main—the part on west side of Front St., south of Main, appears in a later description; $125 per front foot on east side of Front St. south of Main.

In description 26, on east side of Front St. immediately south of Main St.; I valued at $125 per front foot. In description 27, I made two computations. Assuming that the street was there, available for use, that the company had full possession of it and could dispose of it in fee, my valuation is $59,500; assuming that the plat is available for use only from Front St. and Third St., I placed a valuation of $42,840. If it is to be used from the two ends, without access from Main St. to middle lots, my value is $42,840. If Main St. can be put through and used as a street, I have assumed
1126 the depth of the lots on Front and Third Sts. as 124 feet, and have divided the part facing Main St. between those measurements into lots and valued them per front foot in reaching my $59,500 plus valuation. That valuation covers description 28, also; it would involve the use of that as a street, and render it impossible to use it for any other purposes.

I valued description 29 at $5,850; that does not include the cut 127 feet deep by 38 feet on Front St., which I valued at $150 per foot; I considered that as a lot, and included it in my valuation. I valued description 30 at $19,400, description 31, at $7,200, and description 32 at $18,000. I would not price lots in an unplatted tract without streets as high as individual lots after the tract was platted and was being sold, nor would a purchaser pay as much for lots in such tract as for such individual lots, in my judgment.

In description 33, I would place an average value of $50 per lot on that 7.15 acres, for platting purposes, lots 50 by 125 feet. From that point west, on the 5.74 acres, the values would diminish, in my judgment. In description 34, I would value the 72 acres at $100 per acre. I think I understand the location correctly; it is the right of way through the Harlow property.

I would value description 35 at $100 per acre; in description 36, through the West End plat at $100 per acre; on section 15 at $30 per acre; on section 10 at $50 per acre; on lots 3 and 5, section 11, at $100 per acre; on sections 2 and 11 at $160 per acre. These values are exclusive of any structures on the land, and are based on value of adjacent and nearby property, and also on business conditions in Marquette city, and probabilities of growth in different parts of the town, and the use to which I thought this property might be put. I made independent investigation as to land values in Marquette.

1127 I visited the properties I have testified to, and investigated sources of information, as rentals, etc., with regard to value. My knowledge of rents came from Mr. Horton and the employees

who had preceded me in making the investigation. I consulted with them, in the way of looking over their notes, and then I went around and visited the railroad and other properties, enough of them in the vicinity so I could judge whether my men were fairly doing their work or not; so I would be competent to judge of land values.

Twiss.

Cross-examination.

By Mr. Eldredge:

The prices I fixed on lands valued are not the same as those placed by Mr. Horton yesterday; they differ on the frontage on Lake St. and Front St., on the value of the passenger depot grounds, and of the land between Fourth and Fifth Sts. I don't recall other places now.

My value on item 24 is $150 per foot on each side of Front St. north of Main; that is not the same value I placed in my assessment on north property, but it is on south property, to Main St., I think.

In arriving at $59,500 value for depot property on Front St., I placed $150 per front foot. In valuing the parcel at $42,840, I valued entirely from values on Front and Third Sts. I valued the Front St. frontage in that computation at $210 per foot, 153 feet, and extending back half way across the block, 287 feet deep; on remainder of the block, which I valued as fronting on Third St., 153 by 287 feet, I placed a value of $70 per front foot, which made a total of $42,840.

In arriving at my $59,500 valuation, I assumed that the company had fee simple rights in Jackson cut, and took 183 feet front-
1128 age on Front St. extending back 127 feet, at $150 per front foot, 183 feet Third St. frontage at $40 per foot, and 326 feet fronting on Main, with depth of 183 feet, at $62.50 per front foot, making a total of $59,465, and I called it $59,500. The only difference between Mr. Horton and myself on that valuation was that I put $62.50 and he put $45 on the Main St. frontage under this second method of computing the value.

Under this second method the 183 feet frontage on Front St. would include the Jackson cut. I assumed that Main St. frontage was to be utilized for business purposes. I would face buildings on Front St. so that it came to the north side of the cut; I assumed that 30 foot street was a part of the property—the 30 feet north of the cut. Main St. is not used by the public as much as Front St.; it is 36 feet wide, outside of the Jackson cut. My computation included the facing of the Main St. lots on that 36 foot street; that was the most valuable use of the property I could think of.

I valued the land on the southeast corner of Front and Washington Sts. at $200 per front foot on Front St. for 50 feet; from there farther south, I think to Main St., at $150 per foot. South of Main, it ran from $125 down to $100 a front foot at Baraga Ave., as I remember.

I valued the southwest corner of Front and Washington at $200

per front foot on Front St., for 50 feet. I valued the Jopling lot, about 50 feet front on north side of Washington St., at $8,000, when I knew it had just been sold for $9,000, at about $160 a foot. I put the northwest corner of Front and Washington at $200 per front foot, for 50 feet I would say. I don't remember what I put the next lot at; the record and field notes don't show; they don't show the land and buildings separately. The ownership of this particular corner is all in one individual, or one ownership,
1129 and the value of that block was put in as a whole. Mr. Horton and I agreed, after gaining what information we could from people we thought competent, that these corners should be valued at $200 per front foot. I think I carried that valuation 50 feet each way, but am unable to tell how it was graded down from there. I think lots 5 and 6 belong to the Harlow estate, one ownership, as I remember. I can tell the total assessment of land and building on any lot.

In my judgment the property on Washington St., west of Front St., for about one-half or two-thirds of the first block after you get away from the corner lots, that is, to the west side of lot 8 inclusive on the north side of the street, and to the east side of lot 2 inclusive on the south side of the street, is more valuable than property on Front St. I think there should be a break in value for lot 7 on the north side. I know the property purchased by the Elks; it is lot 2, except east 25 feet, and east three feet of lot 3, 41½ feet.

Mr. Wykes: We treated it as 38½ feet when Mr. Horton was on the stand.

I think the assessment amounted to $125 per foot. I was the party who made recommendations to the Commissioners in cases of doubt; I did not assess the property, but had charge of work there. The Commissioners were in Marquette and viewed many properties there before the conclusion of the review. They prepared their valuation rolls as presented in these field books, what we recommended, but made some examination there before the tentative figures were decided upon.

I made such examination of residence property as in my judgment qualified me to pass value on it. I do not claim to have seen all of the property in the city, but paid particular attention to parts of it.

1130 I visited, with Mr. Horton, every plat in the city, but not every house. I could not recall block 12 of John Burt's Add. without looking at my notes; between Third and Front Sts., the south side of Washington St. is the more valuable. On the left hand column of the left hand page of the field books are the figures for real estate put on the rolls by the Commissioners.

The Tax Commission's assessed valuation of lot 3 of block 12 is $4,800; I only have my notes; there is no other record of that roll. We have no roll; our work is carried out on these field books, which are copied from the assessment rolls; then, when the review is held, the figures that the Commission depends upon for valuations are placed in a column provided for that purpose in the local assessment roll. There is no other roll except the local assessment roll.

As to the $3,500 assessment by the Commission on lot 9 of block 2 of John Burt's Add., the figures on the field book, checked off with a blue pencil, would indicate that that was the figure placed on the property. That is the only way I have of knowing that that is so. I did not attend the hearing at Marquette. Those notes made by one of the examiners indicate the owner paid $1,275 for the lot and $3,000 for the house, and that it would be a low valuation at $4,000, one of the verified sales. The Commission placed a value of $3,500 on it.

The east 75 feet of lot 6 of block 4 of John Burt's Add. was assessed at $6,000 by the Commission; the notes given to the Commission show it was a two-story brick building, occupied by the owner, and that he says he would not sell for less than $10,000; worth about $8,000; he has been offered $10,000; also a question mark in next column after the $6,000, and the word "woman" to the right of it, indicating to me that she was a lady whom the Commission did not think able to pay taxes on full amount of property, and gave it
1131 some consideration. I think the statute on exemptions can be construed to give any assessing officer the power to exempt any portion of the value of a piece of property that they choose. It is sometimes done. The Commission follows, largely, the action of the local assessing officers, who are familiar with the facts, and we very seldom disturb their action with regard to exemption, so long as we maintain the relative proportion between properties. (Sec. 3830, subdivision 7, Compiled Laws of 1897, set out in part.)

I think I remember lots 1 and 2 of block 5 of John Burt's Add., known as the Hargrave Flats. This property was assessed at $40,000 by State Board of Assessors, and the notes submitted by the men who originally looked over the property show it was a two story stucco flat consisting of 13 apartments of five rooms and both each, and that it was worth $42,000.

Lot 9 of block 5 was assessed at $3,900 by Tax Commission; I assume those figures are correct. In the judgment of the men who took the field notes reported to the Commission, the property was worth $4,500; it was not the judgment of Mr. Horton and myself. I cannot tell who took the notes. I remember Mr. Horton and I visited those, and where there were any changes made, unless something there indicates that the Commission changed them, they were the figures we recommended after examining the property. I won't say that either or both of us were always there. Sometimes the notes show changes made on review; sometimes they don't. Sometimes the original figures recommended by examiners are erased and Board figures written over them. I do not know who the examiner was here.

Lot 14 of block 5 of John Burt's Add. appears to be assessed at $3,000 by the State Board; the examiner reported it worth $3,500. I cannot recollect that particular property, and no one would
1132 know whether I visited it or not. The notes on that class of property were made by one of the examiners and afterwards examined by the man in charge of the work, either Mr. Horton or myself, or both of us, and all changes outside of those made at Board of Review, from testimony there, were made either by both of us or

Mr. Horton himself. There would be no way of telling definitely how any change came to be made, unless it might be property of which he had specific recollection. We look at so many pieces of residences that it is difficult to carry them in mind, unless some particular thing causes us to remember. We remember business property better than residence property after a space of time, because it constitutes a much smaller percentage of property in any community. I would say this particular reduction was made on the recommendation either of Mr. Horton or myself, so far as I can see the record in the field book.

I cannot tell who made notes on lot 13 of block 6 of John Burt's Add.; it was assessed at $2,500 by the Board, as shown by that book, and the examiner reported it worth $3,000. Some change has been made in that item since it was originally put in there, in the column from which the assessments were put on the roll; I don't know whether that was made by the examiner or by the Board of Review. The records showing the assessment roll will indicate the figures placed by the Board; they do not indicate the figures recommended by the examiners. The figures shown in the column immediately following the description in these notes indicate dollars. As to the two figures opposite each description, I am confused as to their order; Mr. Horton can tell about that, better than I.

In my judgment, residence property in John Burt's Add., has increased some in value in recent years. I think I covered a period of about 10 years in talking with different real estate men there. I think the values I placed in Marquette were true cash values,
1133 conservatively so, that is, those that went on the assessment roll. If there was doubt as to value, I gave it to the owner of the property. In each case where my judgment was called upon, I arrived at a conservative cash value; not a price that might be received for property by waiting eight or ten years, or one at which a man could sell at once.

I endeavored to put all property at its conservative true cash value, and I think I did.

TWISS.

Redirect examination.

By Mr. Wykes:

John Burt's Add., appears on Defts.' Ex. 6*a*, and is four blocks from station. I don't know how many descriptions there are in Marquette; it would run into the thousands, I think. I was not present at the time of the review.

In fixing my assessments upon the real property in Marquette, and in the work looking to final values placed by Tax Commission, I used my best judgment. If there was any doubt as to value in the cases I have stated, I placed the valuation favorable to the railroad company in such cases; that is, if there was a doubt as to whether it should be high or low, I believe I placed the high amount. I resolved the doubt the other way, where I assessed for taxation purposes.

1134 On March 28, 1914.

A. B. HUBBARD, a witness called by defendant.

Direct examination.

By Mr. Wykes:

I am one of the field men of the Tax Commission; I have been employed in that capacity four or five years. During that time, I have been in the office, now and then, for a short time, but on the field practically all the while. The field work has not been confined to placing valuations; I have gathered data for the State Tax Commission, for purposes of valuation, equalization, etc.

I have worked in placing values in Gogebic, Dickinson, Iron and Marquette counties in the Upper Peninsula, and in Van Buren, Clare and Charlevoix counties in the Lower Peninsula; perhaps in some others I do not now recall.

In Marquette County, I worked in Marquette, Ishpeming and Negaunee; I placed values on the Excelsior Iron Mining Company's plat, Nebraska Hill location, and several others, in Ishpeming, and on the Jackson Iron Mining Company's plat, the principal one near the railroads, in Negaunee.

In order to acquaint myself with values, I interviewed real estate men, bankers, etc., and gathered all the knowledge I could, investigated the sales, offers and bids, where I could find them.

The Jackson Iron Mining Company's plat in Negaunee adjoins the South Shore; it lies on both sides of the south line, I think.

It was my purpose, and I carried it out as fully as possible, to place the actual cash value on property for which I fixed values.

1135 HUBBARD.

Cross-examination.

By Mr. Eldredge:

I did not conceal the purpose of my visit to Negaunee or Ishpeming. I don't know that they knew what I was there for, but I never misrepresented my purpose when asked about it. The people I interviewed knew what my purpose was—the bankers and real estate men.

I think there were quite a number of transfers in the Jackson Iron Company's Add.; that is, within the last two years. They were placed on the field book, and I used them after they were placed there. I presume I was at Negaunee about six weeks, solidly. I was called away, at intervals, to different places, at Marquette and Ishpeming.

HUBBARD.

Redirect examination.

By Mr. Wykes:

I was not attempting to fix the value of any mineral, or anything of that kind—just surface values. In talking with people about the amount to be put on their own property, in using the figures they gave me, I always took into consideration the tendency to under-state values given to a man assessing property. I never, as a rule, fixed the value of a man's property at the price he said I should, but I took it into consideration, always using my own judgment.

1136 On April 14, 1914.

CHARLES M. WHITESIDE, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I am sixty years old, and have lived at St. Ignace ten years. Before that, I lived two years near Brevort Lake, which is 15 miles from St. Ignace and 3½ miles west of Allenville. My business in Mackinaw County has been surveying, land looking, and dealing in lands and timber. I was County Surveyor for two years, after 1904.

I have bought and sold lands in the western part of the county, northwest of St. Ignace, and am familiar with land values in St. Ignace and along the railroad outside. I know the lands of the South Shore at St. Ignace.

At St. Ignace the 1.36 acres which lies between High and Spring Sts., and is a part of description 3, would be worth $50 or $60, if the track was taken up and it was in shape to be utilized. My value is based on sales in the vicinity.

The triangular parcel of .63 of an acre in description 3 could hardly be sold at all in that shape. If it was square or rectangular, it might bring $8 or $10 a front foot on Spring St. There would be about three lots in that parcel.

Acreage property in St. Ignace is pretty cheap. Considerable has changed hands inside the city limits for from $1.50 to $6 or $7 an acre. The city limits extend out quite a long way.

The triangle on State St. at the south and east end of description 7, is too small to be good for much—big enough for a popcorn stand or something of that kind. If it had one hundred foot depth, it probably would be worth $20 or $25 a front foot, but it is worth considerably less than that in its present shape.

1137 The remainder of description 7, which is 3,170 feet of right of way about thirty feet wide, and colored green on Complt.'s Ex. 4*a*, is worth about $1 a lineal foot, for the bare land. There have been sales along description 7, some for more and some for less than the price I have named, as some of the land was improved. The un-

improved land there sold lately for rather less than my price. A lot on Goodrow Alley sold recently, but I don't know the price.

I base my judgment of the value of this land upon a general knowledge of the sales that have taken place there since I have been in the town. Not very much property has changed hands there, and everybody usually knows all about a sale.

The .72 of an acre on State St., which is directly opposite the coal and lumber dock, and crossed by the dock track, would be worth more than it is if it wasn't cut across by the track. In its present shape, $20 a front foot on State St. would be a big price for the whole tract. A three-story hotel on about 130 feet front adjoining, including going business, good will, and all, sold for $6,500.

The next property adjoining that, with about the same frontage, but not so deep, with a two-story hotel on it, and as a going business, sold for about $4,000, not long ago. If you deduct for the buildings and the good will, there would not be much left for the land.

You might be able to get $40 or $50 a foot for a lot off the corner next to that .72 of an acre, but the balance would be practically unsalable at any price, as it is a little three-cornered place, not big enough for anything. It has only a little front, and no other way of getting to it. I see it every time I am down town. The right of way across it is fenced in, about 18 feet wide, and it is also
1138 fenced off from the street. There are no structures on the balance of it, and it is used only for ornamental purposes.

Parcel 8, which is 49.81 acres, and takes in the gravel pit and part of the yard, and runs out to mile post 2, would not bring $10 an acre for any other purpose than railroad use, in its present condition, although the gravel pit has been worth considerable to the railroad. Land very near it, if not adjoining, was recently acquired by the State for taxes, and sold at public sale. That is inside the city limits of St. Ignace, and brought considerable less than $10 an acre at the sale.

The lands on the other side, to the east, are improved quite a bit, and have residences. The unimproved land there has been platted at some time, and lots have been sold for from $10 to $150. They have brought less, of late years, than they did 25 or 30 years ago. I had general information of such sales. People who own land there want high prices. They are "land misers" and want to hold it.

I am more or less familiar with the water front property at St. Ignace. For two years, I have had some for sale on claim 6, between State St. and the lake. There is about 200 feet on the lake, and about the same on State St. It lies a short distance north of Bertrand St. The entire piece has been for sale for $600. It is about 200 feet square.

We have considerable water front at St. Ignace. The price depends on how badly you want the particular location—what you are going to use it for—but quite a bit of our water front has been sold for taxes in the last few years.

Some water front between State St. and the lake, and about 80 rods north of South Shore water front, was offered for sale for taxes, but was not redeemed. I don't remember the amount of taxes.

1139 I should say that $5 a front foot would be a liberal price for South Shore water front, unless it was wanted for some specific purpose and no other location would answer it. There are three miles, or better, of water front in St. Ignace.

On description 7, which I valued at $1 per lineal foot for 3,170 feet, I based my judgment upon its location and the property adjoining, some of which can be bought for less, and some of which is worth more, where there is room to do something with it.

St. Ignace property moves slowly—not more than six sales there the last year. For the last ten years, sales have not been very frequent.

WHITESIDE.

Cross-examination.

By Mr. Eldredge:

I said that my knowldege of sales in St. Ignace was hearsay. The lot that the purser bought was the second from the corner, facing Spring, near Chambers St.

If the railroad were taken off of this .72 of an acre, it would be worth about $20 a front foot. Goodrow Alley is one of the principal thoroughfares of the city.

The lot which I said was recently sold was 50 by 100, and is the second from the railroad track, towards the Straits, on Complt.'s Ex. 4*a*, Riggs. That sale was over a year ago. One of the hotel properties—the Dunham House—sold last fall; the other within two years.

1140 WHITESIDE.

Redirect examination.

By Mr. Wykes:

I have sold 2,000 or 3,000 acres altogether. Besides buying and selling, I do surveying, land looking and timber estimating, principally in Mackinaw County.

1141 On April 14, 1914.

JOSEPH L. MCCHESKEY, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I have lived at St. Ignace seven years. I am superintendent of the yards of the Warner-Newton Lumber Co., and am City Assessor, appointed about two months ago. I have investigated the value of city property for the purpose of fixing my assessments. I have attempted to arrive at the cash value, and have covered the part of the city in which South Shore right of way is located. I am familiar with the value of the land between Catherine and Graham Sts.

The owner of the Dunham House property held it for three years at $5,000, and tried to sell it. It had a two-story hotel, and about 130 feet frontage on State St. The lot on Goodrow Alley, mentioned by Mr. Whiteside, was sold by the Fairs for $500. It was on the north side of Goodrow Alley, and had a house, which could not be built for what it was sold for.

The frontage on State St. adjacent to the location of the green triangle, at the end of parcel 7, would be worth about $200 for a lot 50 to 66 feet wide, if the lot were vacant. I intended to leave the assessed value of this property at the same figures at which it now stands, as I don't think we can raise it, the way things are moving in real estate.

Any lot anywhere in the city along State St. would be worth $200, outside of the two hotels, which have good big buildings. I am assessing them at that figure, where unimproved, and I am assessing at actual value.

The .72 of an acre on State St., opposite the coal and lumber dock, would not be worth over $5 to $7 a front foot, if you were liberal, considering the value of property in St. Ignace.

1142 Unimproved lots near the Humphrey or South Shore lots sell for $50 to $125. I was offered any lot there for those prices last spring by McNamara, who holds that property. I think they are 50 to 66 feet front. I have bought only a house and lot in the residence part of the city, and have sold none.

1143 On April 14, 1914.

WILLIAM M. SNELL, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I have lived in Sault Ste. Marie for 26 years; have been County Clerk four years, and Probate Judge 12 years. Since Jan. 1, 1913, I have been practicing law, and handling real estate and loans. Since 1895, I have dealt more or less in real estate, and now own property in Sault Ste. Marie. I own a half interest in the Gilmore G. Scranton Add., in the suburbs, and have an equity in the McGregor Add., which I purchased under contract. The latter is in the southeastern part of the city. I own various other lots, some purchased recently.

In the last year or two, I sold 28 lots in blocks 2 and 3 of Scranton and Robertson's Add. for $150 a lot, or $4,000 net. That was a low sale. I hold for sale that part of private land claim 4, south of Ridge and Spruce Sts., about 2½ acres, for $6,000. That is 208.6 feet on Spruce, 232 feet on Ridge, and 520 feet from street to street. It has been on the market for that price for two or three years, but I haven't been able to sell it.

I am agent for the Foss and Hyde property, which is right south of the Northwestern Leather Co.'s plant and near the Scranton Add. It is platted into lots, three of which I sold four or five years ago for

$150 each. That was the high water price, and we have been forced to revise our prices since then, as there is no demand. I have only sold about eight lots there in five years; the others were sold from $75 to $125 each. There are still about 100 lots unsold. The G. G. Scranton Add. has been on the market since 1901 or 1902. For about two years, we did quite a brisk business, selling a couple of lots a month, for $175 to $250 each, on the installment plan. Then the demand dropped away, and the sales have been very few and far between. I got $250 for the last lot that I sold, as it was a nice corner lot. The inside lots have sold from $175 to $200,
1144 easy terms. I discounted some of the contracts, to get them to carry them out. I sold lots 3 and 5 of block 2 of Scranton's Add. for $75 each. They were 40 by 125 feet. I have sold no lots in the South Shore or Foss and Hyde's First Additions. There seems to be no demand.

Algonquin, south to city limits. For a short distance immediately southwest of the curve, right at Algonquin, there is some fairly good territory which might be worth $150 an acre, possibly more. The Algonquin Add. is in there, and has some very nice lots and houses, while on the west side of the track there is Beadle's Add. Not considering that locality, I should say the strip from Algonquin to city limits would have an average value of $50 an acre. The further out, the lower the value, possibly $15 or $20 at the city limits. I would put $150 on the land from Algonquin to the west side of Hall's Add on the N. E. of the S. W. of 11.

The S. W. of the N. E. of 11 would be worth more, say $600 an acre, counting the lots at $100 each. At that price, there would be no immediate sale, but you would have to hold them for a number of years.

Description 8 on Complt.'s Ex. 3*a*, which contains 9.57 acres, is worth $500 an acre. That is a liberal price, and just exactly what I paid for this land now platted into Scranton's Add. The situation was even more favorable then than at the present time.

Description 7, 17.45 acres, and being divided into four parcels, is worth $350 to $400 an acre. That part of description 6 on Complt.'s Ex. 3*a* is the S. E. of the S. W. of 1; it is worth $250 per acre; that part east of the east line of that description, and west of 6th St., is worth $300 to $350 per acre. Descriptions 5 and 10 on
1145 Complt.'s Ex. 3*a*, and not including any water or riparian rights, is worth $500 to $600 an acre for sub-division. These values are based on sale of adjacent land.

Description 11, immediately south and adjacent to description 6, is worth about the same as 6. Descriptions 12 and 13 I would value a little lower than 6 and 7, because the latter are nearer water front.

The Union Station property immediately north of Private Land Claim 4 is a little more valuable than Private Land Claim 4, as it is the frontage facing the canal. When the station was located at its present location, land values in the Soo were greater than at present. Locating the station there stimulated values adjacent for a while. Although we have had a great slump in real estate values throughout the city, the value close to the station is greater today than when

they made the change. Property along Magazine St. has been greatly enhanced in value—some is worth two or three times as much.

Three or four lots in Emaline Wood's Add. sold for $500, for the bunch. I was offered two lots in Scranton & Robertson's Add., block 3, on Spruce St., for $125 apiece, but refused, because I was loaded. I think they were cheap at that. If you can buy the S. E. of the N. E. of 13 for $10 an acre, it is a good buy.

The corner opposite the new station was enhanced in value by locating the station there, possibly three times, and all property on Portage Ave., between Magazine and Ashum, was thus enhanced, as were lots in Emaline Wood's and Scranton & Robertson's Additions.

1146 SNELL.

Cross-examination.

By Mr. Eldredge:

I would value the land from Algonquin southwesterly to Hall's Add., which is N. E. of S. W. of section 11-47-1 west, at $150 to $200. Only certain portions of S. W. of N. E. are worth $600 an acre. Taking it as a whole, I wouldn't think that Hall's Add. was worth more than $100 an acre; possibly those blocks immediately adjacent to the road might be $150 an acre. From that point to the corner of section 15, the value is $50 an acre. From that point to the city limits, the average would be $15 an acre.

I sold the 28 lots in Scranton and Robertson's Add. for $4,200, and waived my commission, making them $4,000 net. I am now agent for the purchaser, and they are held at higher prices—$10 a front foot on any street on which they front. They run from 25 to 40 feet in width.

The railroad property southwest of the canal as far as Sixth St., I valued at $500 to $600 per acre. From Sixth St. west to the north and south quarter line of the section, I valued it at $350 per acre. The land in there adjacent to the water front is worth about 25% more than that farther away, but my average is $350 an acre.

From this quarter line to the next quarter line, my value was $250, and from there to Algonquin I again divided it, putting $350 on it to the next quarter line, and from the section line to Algonquin $500 an acre.

1147 On April 15, 1914.

CHAS. E. CHIPLEY, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I am thirty years old, and have lived 20 years in Sault Ste. Marie; all the time in real estate business, being now connected with Moffly

& Chipley. We conduct a business on both sides of the Soo. I have been in the general real estate business, making deals all over the city, and have purchased land for myself, and as agent.

We now have lands listed for sale by ourselves and others, and I am familiar with land values in the American Soo, and the right of way of South Shore from the tannery down, and know its value. The tannery is at Algonquin, on the lower part of section 11.

Within the last few years (April, 1913), I sold the parcel of land marked American Brick Co. on Complt.'s Ex. 3*a*, Riggs. It is a part of Private Claim 1, and contains 13.21 acres, all upland, and between 1,000 and 1,400 feet of shore front. It lies immediately across the highway, north from the railroad lands. The consideration was $10,000 for upland, water rights and all.

We have number 225 Magazine St., which is just south of Emaline St. extended east, for sale at $1,500. The lot is 35 by 225, and there is a store building on it easily worth $1,000. In June, 1912, I sold a lot 35 by 150, with buildings worth $1,000, for $1,250.

Lot 4, block 4, Emaline Wood's Add., 50 by 110, with two buildings, worth $500, sold in May, 1912, for $800. Lot 8, block 3, Scranton and Robertson's Add. 35.7 by 105 feet, a vacant lot, sold in April, 1913, for $357. The north half of lot 9 and all of lots 10, 11, 12, 13, 14, 15 and 16, block 2, sold in March, 1912, for $1,500. They were 35.7 by 105 feet. We tried, the other day, to sell lots
1148 17 and 18 of block 3 of Scranton & Robertson's Add. for $125 apiece; they are 25.7 by 105.

From Fourth Ave. extended, to center line of section 12, the land is worth $200 an acre. From center line of section 12, to south bank of water power canal, is worth about $400 an acre. I took the South Shore Add. as a basis. From north bank of water power canal, to west line of Grand Trempes Ave., is worth $1,500 an acre. From west line of Grand Trempes Ave. to east line of Magazine St., is worth $3,500 an acre.

We have the Iroquois Hotel site, with 143 feet on Portage Ave. and 416 feet depth, besides another parcel, 45 by 103 feet, making a total of about 64,000 feet, or an acre and a half. That is for sale for $8,000, and has been for two years, on easy terms.

We also have listed Private Land Claim 73, which is north of Portage Ave., just west of Ashmun St.

I am generally familiar with the South Shore lands as indicated on Complt.'s Ex. 3*a*, Riggs, and the values I have stated would apply to the full width.

CHIPLEY.

Cross-examination.

By Mr. Eldredge:

The 13 acre tract on the river, sold by Perry, was on the market three years at the sale price. Lot 4, block 4, of E. Wood's Add., which sold for $800, was bringing $15 a month income when sold,

in May, 1912; $800 was cheap for it. We can't sell unless we think property is worth more than we sell it for. In my judgment, its present value is $1,000 to $1,200.

1149 The 7½ lots which I mentioned sold for $1,500 net in March, 1912. The buyer, Mr. Olds, got about $1,700 for them, from the Pintsch Compressing Co.

From the line between sections 12 and 1 to the south line of the canal, I valued the land at $400 an acre, but wouldn't buy it at that and plat it.

From the tannery to the line between sections 12 and 1, I valued the South Shore land at $200 an acre. In arriving at these figures, I did not take into consideration the fact that a large tract of land would be thrown on the market, thereby decreasing values, but put a price on it that I thought would be fair under present conditions. My prices represent the speculating value on the present market if the town is improved. This applies on'y to the $200 and $400 valuations. From that point up to the station, the value of the land is more or less fixed by the Scranton & Robertson Add. prices.

CHIPLEY.

Redirect examination.

By Wr. Wykes:

The water front first spoken of as sold for $10,000 was part of a bankrupt estate. I do not know whether it was appraised at that by Stradley, Snell and Davidson, or not. The Soo Savings Bank was interested, and everybody was satisfied at that figure.

The kind of property represented by lot 4, block 4, which sold for $800, would have to bring 20% gross in order to net 7%.

I got the idea that the sales in block 3 of E. Wood's Add. to Mr. Stradley were for the railroad. The property adjoins the railroad land, and that was my personal idea.

1150 On April 15, 1914.

CHARLES RIPLEY, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I have lived in Sault Ste. Marie four years. I am on my second term as City Assessor, and am making my third assessment. I have been Supervisor of Sault Ste. Marie township, and have assisted other assessors in making their assessments. I have owned, bought and sold land in the Soo; at one time, I owned Private Land Claim 94, of 19 acres, just the other side of the round house, which I sold to the railroad company in 1887 for $3,500. L. P. Trempes owned the next land claim, west, at that time. It consisted of 53 acres, originally,

but the shore washed off some of it. That was Land Claim 1, and I understood he sold it to the railroad for $10,000.

Mr. Gager owned 20 acres immediately east of that; the roundhouse now stands there. The railroad paid $3,000 for it, Mr. Trempes said. All three claims took such water front as was adjacent.

Compared with today, the land values in the Soo were high in 1887; that was the year of the boom. I paid $500 for that 19 acres in 1883; it wouldn't be worth $3,500 nor anywhere near that, for any other purpose than the railroad. I think that the sale at $3,500 was at double its true value.

(Objection, by Mr. Eldredge, to testimony as to assessed valuation of property, as having no tendency to show its value.) (Witness produced assessment roll, and testified as follows:)

1151

Section.	Description.	Acres.	Assessed value.	Remarks.
15	W. ½.....	309.53	$4,000	Except right of way.
	N. ½ N. E. ¼.....	71.88	1,000	Except 8.12 acres right of way.
	S. W. ¼ of N. E. ¼	33.45	400	Except 6.55 acres right of way.
	S. E. ¼ N. E. ¼...	40.	400	Except right of way.
10	E. ½ of N. E. ¼ of S. E. ¼.	20.	800	Exempt. Owned by Chippewa Co.
	W. ½ N. E. ¼ S. E. ¼.	19.1	350	Except 9 acres right of way.
	W. ½ S. E. ¼.....	80.	2,000	
	S. E. ¼ S. E. ¼...	37.7	1,400	Except right of way.
11	S. E. ¼ S. W. ¼...	40.	1,600	
	S. W. ¼ S. W. ¼...	33.9	1,400	Except right of way.
	N. W. ¼ S. W. ¼...	37.19	1,700	Exempt. Owned by Chippewa Co.
	N. E. ¼ S. W. ¼...	Lots in Hall's Add.	10 ea.	
	Lot 3 N. E. ¼ N. W. ¼.	19.65	6,000	Has water front.
	S. E. ¼ N. W. ¼ N. of R.	35.15	4,000	Has buildings.
	S. W. ¼ N. W. ¼..	Lots in Bendel's Add.	20 ea.	Ten lots to acre.
	S. W. ¼ N. E. ¼ N. of R.	4.5	600	
	S. W. ¼ N. E. ¼...	21.	3,000	Except R. R. & part of Algonquin.
12	N. W. ¼ N. W. ¼..	12.40	2,000	Exempt. Owned by Soo Line.
	W. ½ N. E. ¼.....	80.	6,000	
	N. E. ¼ N. W. ¼..	21.5	1,600	Except right of way & Chandler's Add.
	N. E. ¼ N. W. ¼..	.27	50	Except right of way & Chandler's Add.

1152 Scranton & Robertson Addition.

Block.	Lots.	Assessed value.	Remarks.
1	19 and 20.....	$200 both	
	29 and 30.....	500 "	Small exception Standard Oil structure.
2	1 and 2.....	400 "	
	3, 4, 5, 6 and 7.....	800 all	
	8 and E. ½ of 9.....	300 "	
	W. ½ of 9 and all 1016 inclusive	1,800 "	Pintsch structure.
	17	200	
	18-24 inclusive.....	1,200 all	
	25-32	800 "	
3	1 to 7.....	700 "	
	8	300	
	9 to 16 inclusive.....	800 all	
	19 and 20.....	200 both	
	25, 26 and 27.....	300 all	
	34	100	
	35	600	Structure.
	36	400	House.
	37 and 38.....	200	Vacant.

In making these assessments, I have tried not to get anything less than 75% of cash value. I think a good many of them will run up to the full cash value—what they are worth today. I know of several that have sold for less than I have assessed them; lot 3 in section 11 sold for just what it is assessed for.

RIPLEY.

Cross-examination.

By Mr. Eldredge:

Since 1896, I have owned only the lot where I live; I have no other business than City Assessor. I previously sailed on the lakes, ran a ferry boat, and was in the mercantile business.

1153 The west half of lot 9, and lots 10 to 16 inclusive, block 2 of Scranton & Robertson's Add., where the Pintsch plant is, are assessed at $1,800. Before the buildings were put there, they were assessed at $1,500. The buildings and permanent fixtures are included in the assessment. They only had one, rather small, brick building at the time I made my assessment, and I put lots, buildings and all at $1,800. In my judgment, the building could be constructed for about $1,000. I treated the tanks as permanent fixtures, and assessed them as part of real estate. I didn't know what they were worth, and didn't ask anybody.

I assessed lot 4, block 4, of E. Wood's Add., at $1,000, and lots 17 and 18, block 3, Scranton & Robertson's Add., at $1,000. The Board of Review cut the latter assessment to $500 for the two lots. They had a dilapidated building, and were formerly assessed at $2,000, which I cut in two. The building had not been burned when the Board cut the assessment to $500.

In the South Shore Add., lot 4, block 1, is assessed at $250; lots 9 and 10, block 2, at $150 for both.

In Chandler's Third Add., lot 7, block 1, is assessed at $800. Lot 4, block 2, is assessed at $400; lot 2, block 2, same addition, at $50; I think there is a building on lot 4. I think there is a house on lot 7, block 1, from the assessment. The vacant lots in Chandler's Add. are assessed at about $50 a lot.

The vacant lots in the South Shore Add. are assessed at $75 each; some lots are higher, but there may be houses on them. Lots 1 to 18 are carried at $400 in Scranton & Robertson's Add., but they are exempt, and the values are not carried out. Lots 3, 4, 5, 6 and 7, block 2, are vacant, and assessed at $800.

1154 Lots 1 to 7 are vacant, and assessed at $100 each. Lots 18 to 24, block 2, are assessed at $1,200, including a building on one of them. Lots 26 to 32 are vacant, and assessed at $150 a lot. Lots 9 to 16, block 3, have $100 a lot; lots 19 and 20, block 3, same price, and all are vacant. Lots 25, 26, 27 and 34 are vacant, and assessed at $100 each.

In Foss & Hyde's Add., the vacant lots in blocks 1, 2, 3 and 4, are assessed at $50 each. In Foss & Hyde's Second Add., lots in block 1 are assessed at about $50 a lot. In blocks 2, 3, 4 and 5, vacant lots are assessed at $30 each. In blocks 6, 7, 8 and 14, vacant lots are assessed at $20 each.

In G. G. Scranton's Add., vacant lots in block 1 are assessed at $40 block 2, $50, and block 3, $40.

In the Algonquin Add., vacant lots in block 1 vary from $50 to $100, nearly all being $50; in block 2, the vacant lots are assessed at $50 each; in block 3, four lots are assessed at $100, for all four.

RIPLEY.

Redirect examination.

By Mr. Wykes:

In the several additions, many of the same lots are assessed to the same person. I have sailed as a master, and owned part of the ferry line between the American Soo and the Canadian Soo. I have dealt more or less in real estate, while in business.

1155 On April 17, 1914.

RALPH J. MACKENZIE, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I am 32 years old, and live 1½ miles southeast of Eagle Mills, in Negaunee Township, of which this is my second term as Supervisor. I have made one assessment. My business is farming. I have had 15 years' experience as a mining engineer, for the U. S. Government in the Philippines, and for myself in contracting in South Africa,

where I also did consulting and geological work. I have a diploma from Washington, given to me by a special board of examiners. I was born and raised in Negaunee, and have lived in Negaunee Township two years.

I investigated land values for the purpose of my assessment, going over the different lands to find out the value of the timber and the quality of the soil for farming. I think I am a competent judge of the value of lands in Negaunee Township, and am familiar with the land along South Shore there. I can give a description of almost every foot of it. It is mostly sandy and rock bluffs, those Diorite bluffs, which are of an igneous formation that is of no value for anything. There is no soil to speak of, at all.

On sections 24, 25 and 26, the land along South Shore is worth $4 an acre. I placed my valuation here according to what I thought it was worth and what I could buy it for. That is about the best price I could get for it. In section 24, there is only rock and high bluffs along the right of way. To the north, there is a farm, and sandy land. To the south, there is practically all sand, with underbrush and second growth.

In section 34, the land is practically all poor farming land. with sand hills; a good deal of marshy swamp adjoins the railroad,
1156 there; more on the north side. The land through that section is worth $3.25 an acre. As you go south from the railroad, the land is better. I am following the north line, and going west. The next section over the line in the city is 33.

I know the south line of South Shore into Marquette, and can value the land along it. From Eagle Mills down to Morgan Heights Sanitarium, which is about a mile, the land is worth about $4 an acre.

Going further east from Morgan Heights, there are only two or three sections within Negaunee Township. The land in that stretch is probably worth $4 or $5 an acre. It is a little better for farming purposes as you get away from the right of way, and there is a little second growth timber on it.

The values I have given represent the entire value. There are no mines in the township, and nothing of any value, at all, in the line of mining. All the lands I have valued are east of the ore formation.

MacKenzie.

Cross-examination.

By Mr. Eldredge:

It is a little over a mile from Eagle Mills to the west line of Negaunee Township, which is the east line of the city of Negaunee, and the value of the land running through there on the south side of the track is about $4 to $5 an acre; on the north side of the track along the right of way, and that swamp, the land is worth not over $3 or $3.50 an acre, under present conditions.

Within a quarter of a mile on either side of the station at Eagle Mills, the land on the north side of the track is worth about $6 an

acre, being pretty well cleared. On the south side of the
1157 track, it is worth $3 to $3.50 an acre. F. W. Read has a farm, which comes right up to the right of way in that quarter of a mile, which I value at $6 an acre. I value all of this land for its use for farming purposes. I didn't say that the iron ore formation did not extend into the township of Negaunee. According to my experience and knowledge, it runs diagonally through—just catching a small section of the township southeast of Eagle Mills. It doesn't go through the township to Marquette, but extends down through into Sands Township, and to the north side of Goose Lake, in Richmond Township.

I knew they had made explorations on the Harlow farm in Marquette, but didn't know the result. According to my knowledge, I wouldn't say that it runs to Marquette at all.

When exploring they have to have some formation in the vicinity. 90% of the farm at Eagle Mills is clear of stumps and could be cultivated; it is not under cultivation now; different ones have been cutting what hay is practically growing wild there. The adjoining lands around there are practically second growth poplar—underbrush. I value them at $3.50 to $4 an acre, and the cleared lands at $6. I think the land where the underbrush is could be cleared for $10 to $12 an acre.

MACKENZIE.

Redirect examination.

By Mr. Wykes:

That land is medium quality sandy soil. Part of that land would not warrant the expenditure of $12 an acre on it for clearing, and part of it would. There are old pine stumps scattered here and there on that farm which I have said was cleared. There are only a few farms in the township, and most of the farmers have to work in the mines, in order to make a living.

1158 These lands can be bought for the prices I have named. I have considered the land worth, to anyone, the amount for which it can be bought.

MACKENZIE.

Recross-examination.

By Mr. Eldredge:

I have inquired from the Cleveland Cliffs Iron Co., and got the prices on different land there, for myself and others. I never tried to purchase any piece of land that lay along the South Shore, anywhere.

I understand they cut between 17 and 20 tons of hay off of about 100 acres of that land at Eagle Mills, cutting wherever there was enough to warrant it. The hay is not wild but was put under cultivation when F. W. Read was there.

They were experimenting, recently, on three or four acres between

a quarter and a half mile from the track, trying to grow alfalfa. The Read farm has only a few acres on the south side of the track, where the right of way runs through, and that was practically all a sawdust dump. The farm runs from the track, back north, and extends about a quarter of a mile on the north on that side. If that farm was re-plowed and re-seeded, it might raise one-half to one ton of hay an acre, and the general average price of hay is $12 a ton.

They have not been farming there for four or five years. The cost of cultivating, seeding and harvesting the crop brings the cost of hay up to a good deal more than you could buy it for.

I was employed in China, by Jardine-Matthewson of London, and also by the Chinese Government, direct, Yuan Shukai, who
1159 is now President of China being the managing director. My duties were those of a mining engineer. I was in China two years, working for the government about 14 months, and for Jardine-Matthewson and the Pekin Syndicate the balance of the time.

I went to Mr. Townsend, the land agent of the Cleveland Cliffs Co., and asked him what they would take for those lands, and he said about $3.25 to $6 an acre—any of it. I wanted to buy three or four forties near Goose Lake, but he said they were in their timber shed, and were reserved. Then I talked it over with him about some other lands that I have had in view there, that we wanted to purchase for pasture lands and fence in, and he said that any of that land there was from $3.25 to $6 an acre. Those lands are even, adjoining the right of way, from the right of way right back through that flat called the Eagle Mills flat.

MACKENZIE.

Recross-examination.

By Mr. Eldredge:

Mr. Townsend told me this about two months ago. I didn't ask him about any particular acreage, but this price that he gave me was on any of that land through there. I asked him about the lands adjoining South Shore and L. S. & I. rights of way, and all the land in that neighborhood known as the Eagle Mills flat, and down around Morgan Heights, and south towards Goose Lake. He said he would be glad to get rid of it for $3.50 to $6 an acre.

I attended St. John's Military Academy, Delafield, Wis., for two years, being about 18 or 19 years old when I got through. During my vacations and after I finished, I was all over the country, getting practical experience. When about 26 years old, I took certain examinations and got credit at the Houghton School of Mines,
1160 but did not enter. At that time, I had been in the Philippines; had been with the Drummond interests of Montreal, in superintending their exploration work, where I stayed four months.

I was, next, an assistant to the geologist in the Department of the Minister of Mines, in Ontario, where I was six months in exploring and superintending. We did diamond drilling and test pitting for all the metals in the Rainy Lake, Port Arthur and St. Mary districts,

my headquarters being in Toronto. We had six or seven scattered prospects, and I went from one to the other, being in charge. My business was to go from one place to the other, make my reports, locate my holes, and superintend the work.

After that, I was in the Philippines seven months as a coal mining expert, under the War Department. I had previously been in China, where I went in 1904. I went to Ontario in 1907.

The first work I did after I left St. Johns was for George Maas, at Negaunee, where I worked as an assistant on a diamond drill. I next went to the Cleveland Cliffs Co., in Negaunee, where I did the same work. I next went to the Mesabe Range, where I did the same work. I next worked for the Republic Iron and Steel Co., at Negaunee, at diamond drilling, going from there to South Africa for geological work and diamond drill contracting for S. Nuiman and Company of London. I stayed there 22 months, returning in the fall of 1903.

I went to Houghton for those examinations when I was about 26. It was about the time I went to the Philippines.

After I returned from South Africa, in 1903, I went to China, in May, 1904, where I stayed about two years, where I was in
1161 charge of diamond drilling, and a coal mining expert. I did not personally run a drill. I next went to Canada. These different positions were obtained through the Sullivan Machinery Co., of Chicago. The drills used on the work were usually the Sullivan Diamond Drills. In the Philippines, I was coal mining expert, in charge, and acting as consulting engineer in all the work, with no one over me but the War Department. I was there for seven months, and spent about five months in addition for the Government, in Illinois, Michigan, New Hampshire, Pennsylvania, California and Colorado, getting my men and machinery for the work in the Philippines. I also went to Mexico, for the Mazapil Copper Co., doing diamond drilling and consulting work.

That is all my mining engineering experience, except that I have been consulted on geological formations and the prospect for minerals.

1162 On April 17, 1914.

WILLIAM PIERCE, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I live at the National Mine, Tilden Township; I have lived in that Township 12 years, and in that vicinity 37 year-. I lived at the Lake Angeline location, south of and near Ishpeming, before I came to Tilden Township. This is my second term as Supervisor, and I have made one assessment.

I know the South Shore line as it runs through that township. It crosses sections 17 and 18-47-27. The lands along the railroad in those two sections are sandy, with no farms; it is mostly covered with undergrowth of poplar and scrub-spruce; there are a few pine stumps remaining.

In my judgment, the land along South Shore through those two sections is worth $3 an acre. I assessed them at $3 an acre, except the northwest quarter of section 18, which I put at $5. Those figures represent my judgment of the cash value of that land, and are my last year's assessment. The Tax Commission raised these values, but I don't remember their figures.

PIERCE.

Cross-examination.

By Mr. Eldredge:

I am a miner, and work at the Iron Mountain Lake Mine, for the Jones & Laughlin Ore Co. That is about three miles from the Lake Angeline property in Ishpeming.

I think the Iron Cliffs Co. owns all the land through there in sections 17 and 18. I never bought or sold any land in Tilden Township, and know of no sales in sections 17 or 18. I valued it principally on the character of the soil.

1163 On April 17, 1914.

CHARLES J. JOHNSON, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I live at Diorite, west of Ishpeming, in Ely Township, of which this is my second term as Supervisor. I have made one assessment, and am about to make another. The South Shore runs through sections 13, 14, 15, 16, part of 17, 8 and 7, town 47-28, in that township.

I have been over the land adjacent to the railroad, often, and know its character very well. It has been cut over years back; there is a great deal of second growth on it, and one farm, along the track, called the Low Moor. It is on sections 16 and 9, and belongs to E. C. Anthony, of Negaunee. There are no other farms along the line of the road, except a few small patches at Clarksburg, which is on section 7. I know the value of the land along the line of the road through that township. In my judgment, it is $3 an acre, on the average. That is for the cut-over lands, and all the way through, alongside of the right of way. They are all cut-over lands, except Low Moor farm, which extends about a mile and a half along the track. That farm is now under cultivation. The Tax Commission placed values above mine. In my judgment, the values which it placed are too high.

JOHNSON.

Cross-examination.

By Mr. Eldredge:

I am a surface foreman for the American Boston Mining Co., at Diorite. 16 or 17 years ago, I bought 80 acres in section 10-48-28, which is away from the railroad. That is the only piece of land I have dealt in in Ely Township. I was summoned here as a witness. Before that, a letter was written to me from the Attorney General's office to make a report, which I did not do.

1164 I valued Low Moor farm at $3,200—buildings and all. I don't think that the buildings alone are worth that. I arrived at the valuation by former assessments, a great deal—used my own judgment, combined with the former assessment, which was the same amount. I have no exact idea of the value of the buildings. The land itself is worth about $3 an acre; I don't know the acreage, but it runs about a mile alongside of the railroad track, and is about a quarter of a mile wide in some places and a half mile in others, most of it being perfectly clear. In my judgment, it is no more valuable than the other land along the road, as it is in a big bog, and very seldom can any crops be raised on it. They get mostly marsh hay off of it; that answers for feeding purposes; I have bought it for $6 a ton, delivered.

The soil at Clarksburg is a sandy loam, and capable of cultivation, but it is all cut up into small parcels, 10 acres being the most which can be cultivated. I put that in at $3 an acre, as an average with the rest, and assessed it at $3. The land there that is cleared and can be cultivated lies along the railroad, and is more valuable than the rest. I think it is worth about $3 an acre; I valued it at the same figure, whether it was in one, forty or eighty acre pieces. That covered the land—not the house. I have never valued that separately. I couldn't do that. I have taken them all, as a forty or an eighty, and valued them all at the same figure. There is hardly any cleared there, with the exception of Low Moor farm, and some of those tracts at Clarksburg.

JOHNSON.

Redirect examination.

By Mr. Wykes:

In making my estimate, I put an average value on the forty or the eighty, and did not attempt to separate, in any case, the cleared land from the rest.

1165 On April 17, 1914.

JAMES KENNAUGH, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I have lived 2½ years at Humboldt; before that I lived 22 years in Ishpeming. I now have charge of the Barron mine at Humboldt, and have been Supervisor of Humboldt Township for two years, having made two assessments. This is my third term. I am familiar with the right of way of the South Shore through that township, and know the character of the land through which it runs.

The main line goes through sections 1, 2, 3, 4-47-29. I am familiar with the value of the lands along the right of way in that township. I have figured up the value through the four sections, and think the average is between $6 and $7 an acre, on the main line, taking the average value on both sides through the township along South Shore.

In getting at this average, I placed the S. ½ of the S. E. ¼ of section 1 at $5 an acre, the N. ½ of the S. E. ¼ at $5 an acre, the N. ½ of the S. W. ¼ at $9.37 an acre, including mineral possibilities, the S. ½ of the S. W. ¼ at $15 an acre, including mineral possibilities, the N. ½ of the S. E. ¼ of section 2 at $6.50 per acre, the S. E. ¼ of the S. E. ¼ at $17.50, the N. ½ of the S. W. ¼ at $6.50, the S. E. ¼ of the N. W. ¼ at $3.25, and the S. E. ¼ of the N. W. ¼ at $6.50.

The land along the railroad throughout section 3 is swampy. In that section, I valued the S. E. ¼ of the N. E. ¼ at $3.25, the S. W. ¼ of the N. E. ¼ at $3.25, the S. E. ¼ of the N. W. ¼ at $3.25, and the N. ½ and the S. ½ of the S. W. ¼ of the N. W. ¼ at $3.50. I valued the N. ½ of section 4 at $3.40 an acre.

Land along the railroad in section 2 is also swampy. There is no timber on any of this land in these three or four sections.

1166 KENNAUGH.

Cross-examination.

By Mr. Eldredge:

None of the forties named cover the Baron mine. Possibly, in section 1, a small part of the Republic branch, where it leaves the main line, might be included. I have put the property on the assessment roll at the figures named.

I was a miner on section 16, at Ishpeming, before I went to Humboldt. I was elected Supervisor within a year after moving, and at that time had no particular knowledge of the values of lands in Humboldt Township. Since then, I have not dealt particularly in

land there, except adjacent to the Baron mine. In a good many instances, I followed the valuations put on land by my predecessors.

I had some knowledge of values, and made some changes, but none in the land along South Shore. In a conversation I had with you (Eldredge) I said I had no knowledge of a mineral formation along the main line of South Shore or just east of Humboldt. When I valued the mineral possibilities, I did so on the judgment of my predecessors, and not on my own. I had not changed any valuations on mineral land there.

The Baron mine is in section 11-47-29, as is the Republic branch of South Shore. The Baron mine is on the whole N. W. ¼ of section 11, and that 160 acres is valued at $51,000.

The South Shore passes over one forty. The Webber lands are in section 2, and the South Shore passes over two forties, which are valued at $12,000, on account of the presumed mineral values. That valuation was on the property before I came. I don't know what value I placed on the right of way across the Baron
1167 mine in a conversation I had with you; the Baron mine forty is the most valuable that South Shore passes through.

In assessing the lands of mining companies, I did not assess the property on which the mines were located and then have that include the value of the minerals, if any, in other lands that the company owned in the same township. Each piece of land was assessed separately. My valuation on the Baron mine property was $43,000. The State Board of Tax Commissioners raised it to $51,000. As a general rule, they raised my valuations, but not very much, and some they lowered a little. The valuations given by me in answer to Mr. Wykes' questions were my own, and as I originally placed them on the roll.

KENNAUGH.

Redirect examination.

By Mr. Wykes:

The Tax Commission got their values higher than I thought the land was worth—too high in some instances. The Baron mine assessment covers land, minerals and improvements. The Webber description, assessed at $12,000, includes mineral value, and many thousands of tons have been mined there.

The figures I have given represent my own judgment of value. I figured that on the Baron mine property my figures are high enough, and that the State Tax Commission is $8,000 too much.

(Mr. Eldredge takes witness out for a consultation, with a view to making him his witness, and states that it isn't the first time he has consulted with him.)

In my judgment, the value of the right of way of South Shore through the forty acres on which it crosses the Baron mine property

is just what the assessment roll says per acre on the Baron
1168 mine property and on section 2.

In our conference, Mr. Eldredge figured that the land was worth $75 an acre for a right of way over this property. On the sheet which Mr. Eldredge gave me, the $12,000 was divided by 80 acres, and $150 set opposite, as the quotient. He showed me that. There was on that sheet, also, $51,000, which was divided by 160, the quotient being $300, which he also showed me. Those assessments cover the land and the minerals, and the minerals do not belong to South Shore.

KENNAUGH.

Recross-examination.

By Mr. Eldredge:

I consulted with you (Eldredge) about the value of those lands, in your office months ago. When I said that the value of the right of way was $150 an acre, I really meant $75, as I told you in our consultation that the right of way was worth about half the value of the land and its minerals. In the same way, I told you that the value of this right of way across the Baron mine was about half the value of that mine, or about $150. That is the conversation we had, both in your office and in the hall. You simply asked me what I told you in your office.

KENNAUGH.

Redirect examination.

By Mr. Wykes:

I think it was Mr. Eldredge who first suggested taking one half for the mineral and one half for the right of way.

1169 KENNAUGH.

Recross-examination.

By Mr. Eldredge:

Of course, it was a verbal conversation, but I think you suggested it. In soft ore, the value of the right of way would be the value of the ore it would tie up. I told you that the Baron formation was hard, and wouldn't tie up more than there was under the right of way—perhaps not that much.

Q. The $75 and $150 you have given there is your judgment of the valuation, is it not?

A. When I come to think about it, and when you mention it, I know we did have a conversation of that description.

Q. Then whose judgment was it, yours or mine, that you are testifying to?

The Master: Do you understand the question?

A. I understand it. Of course, I don't know just what is was; it might have been a suggestion from you, in the first place; I don't say but what it was; it might have been; but I remember talking about that the right of way on the Baron mine was not a detriment to taking the ore out—not like soft ore mines.

Q. But the question is the value; whose judgment is that; is it your judgment that the value is as you have stated—$75 and $150 respectively?

A. Why I should say it would be $75 on that particular property.

Q. That is your judgment?

A. Yes.

Q. How about the other property—the same way?

A. All the Humboldt property is about the same formation—hard.

1170 KENNAUGH.

Redirect examination.

By Mr. Wykes:

We are now mining about 300 feet under the track at Humboldt. It is about 600 feet perpendicular, and so deep that there is no danger of a cave-in.

I never saw you before you came into the courtroom here, today, and you never talked with me about the values that I placed on this land.

I didn't take into consideration the fact that the right of way might be moved off, to a nearby location, when I said that the value of the right of way might be the value of the ore under it. That wouldn't be necessary at Humboldt.

1171 On April 20, 1914.

L. J. LE VEQUE, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I live in Marquette, where I am in the real estate business. I am handling rural land, mostly.

I own the S. E. ¼ of the N. E. ¼ of 12, 47-23, near Sand River station, Marquette County, which I will sell for $5 an acre. It is worth about that.

I own the S. W. ¼ of the N. E. ¼ and the S. E. ¼ of the N. W. ¼ in section 3, 47-29, Humboldt Township, Marquette County. That is in a swamp, and I would consider it worth about $6 an acre.

I own property in the West End Add., in Marquette, and will sell it for just about what it is assessed at.

I have a one-half interest in the N. E. ¼ of the S. W. ¼ of section 15, in Marquette, 38.21 acres. I will take $50 an acre for my interest. It is in 15, 48-25.

I sold some lots in block 10 of Nester's Add., in Marquette, for $20 to $30 a lot.

I sold lots 1 and 2 in block 1 in the West End Add., on Washington St., at $115 each.

LE VEQUE.

Cross-examination.

By Mr. Eldredge:

I deal chiefly in timber land. Where I have cut-over land, it is generally where I have sold or removed the timber. In Humboldt Township, the lands that I own do not include the mineral rights.

1172 On May 4, 1914.

F. J. BURTLESS, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I live at Lansing, where, for ten years, I have been Secretary of the Board of State Tax Commissioners and State Board of Assessors. I have been connected with the State Board of Tax Commissioners continuously for 14 years.

The Board has, every year since the law went into effect, employed a competent stenographer to report all testimony and statements made by the representatives of the different railroad companies upon review. This testimony has been transcribed and bound, and is a part of the records of the office. The attorneys are always sworn before they give those statements; it is the intent to have the statements made under oath. The stenographic report was made for each year, from 1902 until the present time. I think Glenn L. Williams was the stenographer each year until the last three or four years. He is now circuit court stenographer in Lenawee County. After the statements made on review are taken, they are always written up.

(Mr. Eldredge objects to the testimony as irrelevant and immaterial, and as having no tendency to prove the correctness of the notes, which cannot be proved except by the stenographer or some one who heard the statements.)

As Secretary of the Commission, I have the typewritten notes of those reviews, which are considered records of the State Board of Assessors. They are frequently referred to by members of the Board, and are regarded by the Commission and by the employees in the office, and by those called upon to use them, as nearly correct as it is possible to get them.

A transcript of the stenographic report does not show, in all cases, whether the representatives were sworn, or not, and there is nothing to show that Mr. Eldredge was sworn when he appeared before
1173 the Board, on Jan. 7, 1903. The law governing the assessment of railroad property provides the date upon which an as-

sessment must be made, and then provides that for a certain length of time these assessments shall be subject to review, during which time the representatives of railroad companies may appear and make such statements as they desire; it is these statements that are taken down stenographically.

BURTLESS.

Cross-examination.

By Mr. Eldredge:

It does appear that in some cases they were sworn.

1174 (Mr. Wykes produced a printed copy of the report of the land department of the D. M. & M. R. R. Co., being a cumulative statement from Feb. 1879, to Jan. 1, 1912, and asked to have it marked Defts.' Ex. 65. He stated, further, that he assumed plaintiff had a duplicate, or an authenticated copy, and called on plaintiff to produce it. Mr. Eldredge stated that he had no such copy, and knew nothing about any part of the report, except one item.)

1175 On May 4, 1914.

THOMAS MCCORMICK, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I live in Lansing, where I work for the State Board of Assessors. I have access to the different reports of the railway companies to that Board, and have recently taken certain of the figures for operating expenses for different railroads from those reports and tabulated them; the tabulation is embraced in nine sheets. For the companies named in those sheets, I took off the operating ratio, the maintenance of way, maintenance of equipment, traffic, transportation, and general, expenses, and the total.

The first company named is the D. S. S. & A., for which I have two tabulations, the first being for the system and the other for Michigan.

For all the other railroads named the figures are for the system. In each instance, I kept the reports for the years 1908 to 1913 inclusive, except the Detroit, Bay City & Western, which has had but two or three years' operation, and the Soo Line, the 1909 and 1910 reports of which were not in the office when I made the compilation. Under the item of expenses in each instance, I have included another set of figures which represents the percentage which that item bears to the total. Everything else but those percentages appears in the reports. I computed the percentage, myself, and have checked all the figures, to see that they are correct.

(Mr. Eldredge objects to the introduction of the compilation, but admits he may be inconsistent if plaintiff has put in similar compilations to prove its case.)

(The compilation is set forth in full as follows:)

Year.	Operating ratio.	Maintenance of way.	Maintenance of equipment.	Traffic expense.	Transportation expense.	General expense.	Total.
1908.....	75.51	$561,404	$351,855	$85,274	$1,136,354	$71,328	$2,206,215
		25.45%	15.95%	3.86%	51.51%	3.23%	100%
1909.....	72.79	445,281	327,790	100,884	1,027,071	78,491	1,979,518
		22.49%	16.56%	5.10%	51.88%	3.97%	100%
1910.....	68.72	527,683	361,459	107,909	1,193,180	79,016	2,269,247
		23.25%	15.93%	4.76%	52.57%	3.48%	100%
1911.....	72.07	512,170	359,552	118,982	1,195,816	82,821	2,269,341
		22.57%	15.84%	5.25%	52.69%	3.65%	100%
1912.....	75.98	575,766	360,164	121,764	1,225,429	112,038	2,395,161
		24.04%	15.04%	5.08%	51.16%	4.68%	100%
1913.....	79.83	716,711	411,864	119,642	1,358,579	117,694	2,724,490
		26.31%	15.12%	4.39%	49.87%	4.31%	100%

Duluth, South Shore & Atlantic (Michigan)

Year.	Operating ratio.	Maintenance of way.	Maintenance of equipment.	Traffic expense.	Transportation expense.	General expense.	Total.
1908.....	71.51	$468,171	$293,422	$71,112	$947,637	$59,482	$1,839,824
		25.45%	15.95%	3.86%	51.51%	3.23%	100%
1909.....	60.28	368,713	271,425	83,536	850,460	64,994	1,639,128
		22.49%	16.56%	5.10%	51.88%	3.97%	100%
1910.....	64.88	439,658	301,162	89,908	994,140	65,835	1,890,703
		23.25%	15.93%	4.76%	52.58%	3.48%	100%
1911.....	69.59	418,276	298,954	98,339	1,020,533	68,376	1,904,478
		21.96%	15.70%	5.16%	53.59%	3.59%	100%
1912.....	72.00	454,032	302,391	99,922	1,046,254	95,406	1,998,005
		22.72	15.13%	5.00%	52.37%	4.78%	100%
1913.....	75.98	581,520	341,173	98,408	1,143,085	100,640	2,264,826
		25.68%	15.06%	4.35%	50.47%	4.44%	100%

Mineral Range

Year.	Operating ratio.	Maintenance of way.	Maintenance of equipment.	Traffic expense.	Transportation expense.	General expense.	Total.
1908.....	85.46	$136,248	$144,088	$7,041	$386,550	14,938	688,865
		19.78%	20.92%	1.02%	56.11%	2.17%	100%
1909.....	84.83	147,462	132,877	7,249	398,116	15,329	701,033
		21.04%	18.95%	1.03%	56.79%	2.19%	100%
1177							
1910.....	89.37	170,098	144,424	7,920	400,508	15,719	738,669
		23.03%	19.55%	1.07%	54.22%	2.13%	100%
1911.....	94.80	183,746	131,561	5,893	371,044	15,343	707,587
		25.97%	18.59%	.83%	52.44%	2.17%	100%
1912.....	83.81	124,968	127,389	5,786	370,874	16,500	645,517
		19.36%	19.73%	.90%	57.45%	2.56%	100%
1913.....	80.53	153,690	131,932	5,393	371,938	17,051	680,004
		22.60	19.40	.79%	54.70%	2.51%	100%

Minneapolis, St. Paul & Sault Ste. Marie

Year.	Operating ratio.	Maintenance of way.	Maintenance of equipment.	Traffic expense.	Transportation expense.	General expense.	Total.
1908.....	64.29	$1,330,856 18.79%	$1,361,625 19.23%	$235,675 3.33%	$3,953,952 55.84%	$199,009 2.81%	$7,081,117 100%
1909.....	56.03	.....	.....	.....	.....	.....	.....
1910.....	.....	.....	.....	.....	.....	.....	.....
1911.....	68.09	2,355,569 16.06%	3,153,145 21.49%	542,308 3.70%	8,123,936 55.37%	495,696 3.38%	14,670,654 100%
1912.....	60.31	2,721,724 17.20%	3,340,512 21.11%	562,727 3.56%	8,647,290 54.65%	550,154 3.48%	15,822,407 100%
1913.....	59.34	3,469,510 18.43%	3,970,817 21.10%	645,883 3.43%	10,054,734 53.42%	681,862 3.62%	18,822,807 100%

Chicago, Milwaukee & St. Paul

Year.	Operating ratio.	Maintenance of way.	Maintenance of equipment.	Traffic expense.	Transportation expense.	General expense.	Total.
1908.....	65.28	$6,642,820 17.87%	$7,039,270 18.94%	$1,281,683 3.45%	$21,360,567 57.48%	$839,028 2.26%	$37,163,368 100%
1909.....	64.66	7,288,603 18.82%	7,270,774 18.77%	1,334,006 3.45%	21,764,471 56.19%	1,073,385 2.77%	38,731,239 100%
1910.....	69.07	8,472,825 18.92%	7,724,569 17.24%	1,122,710 2.51%	26,347,283 58.82%	1,123,610 2.51%	44,790,997 100%
1911.....	72.42	7,865,401 16.71%	8,839,384 18.78%	1,264,272 2.69%	27,965,953 59.44%	1,118,709 2.38%	47,053,719 100%
1178 1912.....	75.64	$8,812,314 18.46%	$9,681,271 20.28%	$1,266,136 2.65%	$26,842,051 56.22%	$1,141,384 2.39%	$57,743,150 100%
1913.....	68.90	9,707,386 17.06%	12,641,964 22.22%	1,610,263 2.83%	31,676,106 55.67%	1,263,904 2.22%	56,899,623 100%

Chicago & Northwestern

Year.	Operating ratio.	Maintenance of way.	Maintenance of equipment.	Traffic expense.	Transportation expense.	General expense.	Total.
1908.....	65.87	$8,056,546	$6,774,950	$1,080,580	$24,643,194	$1,086,043	$41,641,313
		19.35%	16.27%	2.59%	59.18%	2.61%	100%
1909.....	65.46	8,422,265	7,845,969	1,127,864	24,666,863	1,128,279	43,191,240
		19.50%	18.17%	2.61%	57.11%	2.61%	100%
1910.....	70.31	10,774,338	9,149,217	1,257,756	29,677,354	1,294,954	52,153,619
		20.66%	17.54%	2.41%	56.91%	2.48%	100%
1911.....	70.76	10,002,073	9,307,196	1,232,016	30,836,561	1,634,864	53,012,710
		18.87%	17.56%	2.32%	58.17%	3.08%	100%
1912.....	71.51	9,368,721	9,569,853	1,340,086	30,924,938	1,498,245	52,701,843
		17.78%	17.16%	2.54%	57.68%	2.84%	100%
1913.....	70.15	11,568,496	11.568,496	1,348,982	32,241,258	1,592,858	58,252,780
		19.74%	19.86%	2.32%	55.35%	2.73%	100%

Copper Range

Year.	Operating ratio.	Maintenance of way.	Maintenance of equipment.	Traffic expense.	Transportation expense.	General expense.	Total.
1908.....	74.72	$196,929	$98,961	$14,942	$274,541	$17,907	$603,280
		32.64%	16.40%	2.48%	45.51%	2.97%	100%
1909.....	70.75	207,747	41,241	16,977	251,717	24,271	541,953
		38.33%	7.61%	3.13%	46.45%	4.48%	100%
1910.....	58.80	119,874	28,979	17,717	245,384	27,954	439,908
		27.24%	6.59%	4.03%	55.78%	6.36%	100%
1911.....	69.60	118,752	68,937	19,000	252,931	26,742	486,362
		24.42%	14.17%	3.91%	52.00%	5.50%	100%
1912.....	65.10	113,043	72,793	19,435	237,493	28,853	471,617
		23.97%	15.43%	4.12%	50.36%	6.12%	100%
1913.....	64.20	105,639	102,073	19,157	239,108	27,534	493,411
		21.39%	20.69%	3.88%	48.46%	5.58%	100%

Ann Arbor

1179

Year.	Operating ratio.	Maintenance of way.	Maintenance of equipment.	Traffic expense.	Transportation expense.	General expense.	Total.
1908.....	73.06	$191,571	$347,457	$34,265	$767,682	$34,622	$1,375,597
		13.93%	25.26%	2.49%	55.81%	2.51%	100%
1909.....	70.07	254,718	193,865	38,214	662,157	48,359	1,197,313
		21.28%	16.19%	3.19%	55.30%	4.04%	100%
1910.....	69.97	298,306	246,453	46,981	642,806	64,222	1,298,768
		22.97%	18.98%	3.62%	49.49%	4.94%	100%
1911.....	67.47	259,444	245,415	48,587	666,734	85,194	1,305,374
		19.87%	18.80%	3.72%	51.08%	6.53%	100%
1912.....	66.94	238,049	236,678	50,442	800,711	93,568	1,419,448
		16.77%	16.68%	3.55%	56.41%	6.59%	100%
1913.....	69.23	295,141	259,188	49,641	743,899	87,215	1,435,084
		20.57%	18.06%	3.46%	51.84%	6.07%	100%

Chicago, Detroit & Canada Grand Trunk

Year.	Operating ratio.	Maintenance of way.	Maintenance of equipment.	Traffic expense.	Transportation expense.	General expense.	Total.
1908.....	166.19	$154,088	$101,830	$19,871	$349,918	$10,717	$636,424
		24.21%	16.00%	3.12%	54.98%	1.69%	100%
1909.....	120.58	128,387	85,306	23,693	337,543	15,037	589,966
		21.76%	14.46%	4.02%	57.21%	2.55%	100%
1910.....	99.50	89,305	138,559	23,320	364,394	17,842	633,420
		14.10%	21.87%	3.68%	57.53%	2.82%	100%
1911.....	95.58	123,737	126,491	21,783	407,765	18,240	698,016
		17.73%	18.12%	3.12%	58.42%	2.61%	100%
1912.....	87.43	152,252	151,014	22,476	459,803	19,318	804,863
		18.92%	18.76%	2.79%	57.13%	2.40%	100%
1913.....	87.47	113,055	150,842	23,627	552,445	20,975	860,944
		13.13%	17.52%	2.74%	64.17%	2.44%	100%

Detroit, Bay City & Western

Year.	Operating ratio.	Maintenance of way.	Maintenance of equipment.	Traffic expense.	Transportation expense.	General expense.	Total.
1911.....	(Commenced Operation.)						
1912.....	59.67	$7,336 14.47%	$8,759 17.27%	$1,916 3.78%	$29,116 57.41%	$3,586 7.07%	$50,713 100%
1913.....	47.73	7,018 15.34%	7,661 16.74%	2,026 4.43%	25,423 55.56%	3,629 7.93%	45,757 100%

Detroit & Mackinac

1180							
1908.....	68.07	$144,244 17.87%	$189,060 23.42%	$24,546 3.04%	$422,446 52.32%	$27,069 3.35%	$807,365 100%
1909.....	69.29	183,863 23.10%	185,230 23.27%	22,320 2.80%	371,944 46.72%	32,688 4.11%	796,045 100%
1910.....	68.99	199,827 23.52%	196,888 23.18%	26,552 3.13%	392,788 46.24%	33,400 3.93%	849,452 100%
1911.....	69.87	174,573 21.23%	203,439 24.74%	26,065 3.17%	385,414 46.86%	32,948 4.00%	822,399 100%
1912.....	71.89	201,752 22.46%	218,290 24.30%	29,504 3.29%	411,688 45.84%	36,879 4.11%	898,113 100%
1913.....	68.16	166,415 19.65%	174,768 20.64%	26,969 3.19%	443,602 52.39%	34,942 4.13%	846,695 100%

Detroit & Toledo Shore Line

Year.	Operating ratio.	Maintenance of way.	Maintenance of equipment.	Traffic expense.	Transportation expense.	General expense.	Total.
1908.....	54.66	$106,623	$107,706	$7,754	$241,569	$16,497	$480,149
		22.21%	22.43%	1.61%	50.31%	3.44%	100%
1909.....	58.47	123,664	61,658	11,260	234,812	18,382	449,776
		27.49%	13.71%	2.50%	52.21%	4.09%	100%
1910.....	50.32	114,183	54,853	14,126	255,298	21,291	459,751
		24.84%	11.93%	3.07%	55.53%	4.63%	100%
1911.....	50.45	115,705	51,974	14,992	277,103	22,009	481,783
		24.02%	10.79%	3.11%	57.52%	4.56%	100%
1912.....	46.09	108,976	57,926	13,757	337,270	24,348	542,277
		20.10%	10.68%	2.54%	62.20%	4.48%	100%
1913.....	47.22	145,378	46,065	14,739	375,047	28,426	639,655
		22.73%	11.89%	2.30%	58.63%	4.45%	100%

Grand Rapids & Indiana

Year.	Operating ratio.	Maintenance of way.	Maintenance of equipment.	Traffic expense.	Transportation expense.	General expense.	Total.
1908.....	77.53	$673,859 18.66%	$772,713 21.40%	$120,013 3.33%	$1,882,524 52.14%	$161,302 4.47%	$3,610,410 100%
1909.....	73.98	570,390 16.74%	719,420 21.12%	122,088 3.58%	1,827,571 53.64%	167,658 4.92%	3,407,126 100%
1181 1910.....	76.37	646,739 16.63%	884,733 22.75%	137,531 3.54%	2,051,282 52.76%	168,007 4.32%	3,888,291 100%
1911.....	80.12	659,824 16.24%	853,489 21.01%	144,547 3.56%	2,228,233 54.84%	176,642 4.35%	4,062,734 100%
1912.....	77.84	601,728 14.92%	882,930 21.89%	135,968 3.37%	2,233,928 55.37%	179,565 4.45%	4,034,119 100%
1913.....	79.18	777,462 17.79%	919,817 21.05%	139,532 3.19%	2,343,055 53.62%	190,195 4.35%	4,370,062 100%

Lake Shore & Michigan Southern

Year.	Operating ratio.	Maintenance of way.	Maintenance of equipment.	Traffic expense.	Transportation expense.	General expense.	Total.
1908.....	66.07	$5,787,388	$5,152,284	$1,055,389	$14,182,104	$697,405	$26,874,570
		21.53%	19.17%	3.93%	52.77%	2.60%	100%
1909.....	62.96	5,029,050	6,184,634	1,006,575	13,200,039	700,642	26,120,940
		19.25%	23.68%	3.85%	50.54%	2.68%	100%
1910.....	64.81	6,242,268	7,449,964	1,113,568	15,884,763	794,851	31,485,414
		19.83%	23.66%	3.54%	50.45%	2.52%	100%
1911.....	71.66	7,928,833	7,580,622	1,144,372	17,110,669	956,830	34,721,326
		22.84%	21.83%	3.30%	49.28%	2.75%	100%
1912.....	64.47	5,655,083	8,255,521	987,347	16,818,102	946,698	32,662,751
		17.31%	25.28%	3.02%	51.49%	2.90%	100%
1913.....	66.14	7,148,005	10,363,121	1,020,739	18,965,469	1,046,283	38,543,617
		18.55%	26.89%	2.65%	49.20%	2.71%	100%

Michigan Central

Year.	Operating ratio.	Maintenance of way.	Maintenance of equipment.	Traffic expense.	Transportation expense.	General expense.	Total.
1908.....	69.50	$3,086,095 17.31%	$3,242,091 18.18%	$760,833 4.27%	$10,307,224 57.81%	$433,860 2.43%	$17,830,103 100%
1909.....	69.21	3,101,724 17.59%	3,597,475 20.40%	731,652 4.15%	9,783,206 55.47%	422,376 2.39%	17,636,433 100%
1910.....	68.13	3,656,027 18.63%	3,778,126 19.25%	828,897 4.21%	10,858,320 55.31%	511,286 2.60%	19,629,657 100%
1911.....	75.02	4,042,539 18.10%	4,341,404 19.44%	848,955 3.80%	12,503,868 56.00%	593,022 2.66%	22,329,787 100%
1182 1912.....	70.40	$3,424,356 15.97%	$4,232,529 19.74%	$770,921 3.60%	$12,461,699 58.13%	$548,603 2.56%	$21,438,108 100%
1913.....	68.40	4,199,116 16.86%	5,170,762 20.76%	801,007 3.22%	14,110,794 56.66%	624,524 2.50%	24,906,203 100%

Pere Marquette

Year.	Operating ratio.	Maintenance of way.	Maintenance of equipment.	Traffic expense.	Transportation expense.	General expense.	Total.
1908.....	76.15	$1,658,834	$2,043,043	$306,096	$6,104,379	$314,439	$10,426,791
		15.91%	19.59%	2.94%	58.55%	3.01%	100%
1909.....	71.33	1,669,220	2,018,494	349,971	5,712,493	357,017	10,107,195
		16.52%	19.97%	3.46%	56.52%	3.53%	100%
1910.....	70.04	1,932,437	2,117,700	420,298	6,370,632	362,173	11,203,240
		17.25%	18.90%	3.75%	56.87%	3.23%	100%
1911.....	80.43	2,123,296	2,550,859	467,790	7,292,092	424,373	12,858,410
		16.51%	19.84%	3.64%	56.71%	3.30%	100%
1912.....	80.41	2,064,891	2,804,938	423,916	7,707,865	407,194	13,408,804
		15.40%	20.92%	3.16%	57.48%	3.04%	100%
1913.....	79.89	2,944,517	2,987,156	400,347	7,146,827	427,575	13,906,422
		21.17%	21.48%	2.88%	51.39%	3.08%	100%

St. Clair Tunnel

Year.	Operating ratio.	Maintenance of way.	Maintenance of equipment.	Traffic expense.	Transportation expense.	General expense.	Total.
1908.....	46.09	$15,733	$18,612	.....	$106,075	$72	$140,492
		11.20%	13.25%	.....	75.50%	.05%	100%
1909.....	38.50	23,120	22,522	.....	57,863	3,186	106,691
		21.67%	21.11%	.....	54.23%	2.99%	100%
1910.....	39.44	42,051	13,386	.....	54,565	3,197	113,199
		37.15%	11.83%	.....	48.20%	2.82%	100%
1911.....	35.99	34,512	12,861	.....	54,883	3,197	105,459
		32.73%	12.20%	.....	52.04%	3.03%	100%
1912.....	28.48	10,579	11,340	.....	59,408	3,232	84,559
		12.51%	13.41%	.....	70.26%	3.82%	100%
1913.....	27.75	13,242	14,993	.....	66,716	1,670	96,621
		13.71%	15.52%	.....	69.05%	1.72%	100%

1183 I have now the reports from which these figures were taken, and will produce for Mr. Eldredge any of them which he desires in order to get the figures that he says are material.

McCORMICK.

Cross-examination.

By Mr. Eldredge:

The figures given first are for the D. S. S. & A., entire system; next, for the same road in Michigan; next, the Mineral Range, which is entirely in Michigan; next, the Soo Line, which covers the system.

The Soo Line report for 1906 does not detail the mileage as to states. The total miles operated are 1,039.71, main line, but it does not detail as to states, and I do not know, of my own knowledge. The 1911 report gives main line, Michigan, 191.09 miles, Wisconsin, 262.80, Minnesota, 224.98, North Dakota, 361, and total owned, 1,039.87 miles; total operated 1,798.40. For the year 1908, the total expenditures for maintenance of way in Michigan was $163,342.84, which is 19.33% of the total; the maintenance of equipment expense was 19.40%; traffic expense, 2.92%; transportation expense, 55.91%; general expense, 2.41%.

We haven't a 1910 report. Mr. Parker gave me that figure of 56.03% for 1909. It was not taken from the records in the office. (Mr. Eldredge moves that the figure, 56.03%, being the ratio of operating expense of the Soo Line, for 1909, be stricken out.)

For 1911, maintenance of way and structures was 21.08%; maintenance of equipment, 20.09%; traffic, 2.97%; transportation, 52.74%; general expense, 3.17%. The 1912 report was missing; we will find it.

1184 For 1913, maintenance of way and structures was 16.87%; maintenance of equipment, 22.66%; traffic, 2.47%; transportation, 54.75%; general expense, 3.23%.

I do not know on what basis the Soo Line separates Michigan operating expenses from those for the balance of the system. For 1908, the total operating expense ratio for the Soo Line for Michigan was 75.85%; for 1911, 76.26%; for 1913, 72.36%. I will furnish the figures for 1912, if I can find the report. For 1908, the total main line operating mileage of the C. M. & St. P. was 7,516.33 miles. That was divided as follows: Michigan, 159.12 miles, Wisconsin, 1,774.12, Illinois, 413.45, Iowa, 1,869.95, Minnesota, 1,241.79, North Dakota, 152.76, South Dakota, 1,534.63, and Missouri, 140.27. For 1913, the total mileage was 9,321.99, divided as follows: Illinois, 411.92, Wisconsin, 1,765.09, Iowa, 1,868.30, Minnesota, 1,238.60, North Dakota, 378.85, South Dakota, 1,795.54, Missouri, 140.27, Michigan, 167.04, Montana, 818.04, Idaho, 197.31, Washington, 541.03. The gross revenue from operation in 1908 totalled $56,932,620.50, of which $830,684.07 was from Michigan. Its ratio of operating expense to gross revenue in Michigan is estimated at 87.76%.

I will prepare a statement showing for each year, from 1908 to 1913 inclusive, the gross revenues of the C. M. & St. P., its gross revenue in Michigan, and the ratio of its operating expenses to its gross revenue in Michigan, and divide the maintenance of way and structures, maintenance of equipment, traffic, transportation, and general, expenses, as I have divided it with reference to the system. I will do the same thing with reference to the C. & N. W. separating its mileage into the states through which it operates.

I have prepared the information for which you asked me with reference to the C. M. & St. P.; it is contained in the sheet which I hand you.

I have prepared the information for which you asked me with reference to the C. & N. W.; it is on the sheet which I hand
1185 you. It is stated in the report that the expenses are proportioned to Michigan on the train mileage basis.

I have also prepared the same information with reference to the Michigan Central, but have taken the information from the reports of that railroad to the Michigan Railroad Commission. I have prepared the same information with reference to the L. S. & M. S.

The Ann Arbor has very little mileage except that which is in Michigan. The Chicago, Detroit & Canada Grand Trunk Jct. Ry. is about 60 miles long, and a part of the Grand Trunk System; it runs from Port Huron to Detroit. The Detroit, Bay City & Western lies entirely in Michigan, it is a new road, which commenced operation in 1911, but was not assessed for that year.

The total mileage of the G. R. & I. is 522.51 for main line operated, of which 376.14 is operated in Michigan; 313.43 are owned in Michigan, and 53.10 in Indiana.

For 1913, the operating ratio for G. R. & I. was 79.18% for the system, and 77.67% for Michigan. For 1912 the ratio of operating expense was 77.84% for the system and 80.53% for Michigan. In 1913, they were the same, 87.47% for each. In 1910, they were almost the same on the system and in Michigan, there being .34 of 1% difference. In 1909, Michigan was .88 of 1% less than the system.

The Pere Marquette does not separate its operating expenses in Michigan from the system in its reports to the State Board of Assessors.

1186 On May 5, 1914.

EDWARD C. COOLEY, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I have lived at Ishpeming about 27 years; I have been in the real estate and insurance business about 12 years, maintaining offices at both Ishpeming and Negaunee, and acting as agent, and buying and selling lands in and around those places. I have bought and sold lands of my own during that time. I am familiar with South Shore,

and the property along it, from the west limits of Ishpeming to the east limits of Negaunee.

From Winthrop Jct. west to the city limits of Ishpeming, I should judge that the land is worth about $100 an acre. I know very nearly where the city limits are.

From Winthrop Jct. east to the roundhouses shown on Complt.'s Ex. 15, Riggs, the lands along, South Shore right of way are worth about $200 an acre. From the roundhouses to the point where the line between sections 9 and 10 crosses South Shore, the lands are worth about $500 an acre. From that point to where the section line crosses the railroad to the first street shown on Ex. 15, the lands are worth about $500 a lot. There are six or seven lots to the acre; that land could be platted and used for residence purposes.

Between Spruce and Lake Sts., the land is worth about $800 a lot. Between Lake and Pine Sts., the land is worth about $1,200 a lot. Between Pine and Main Sts., the lots facing on Canda St. are worth about $1,400 a lot, while those fronting on Main St. are worth $150 a front foot. Between Main & First Sts., the short lots next to the railroad are worth $2,000 a lot. Assuming South Shore station property could be divided into lots, I should think that it would
1187 be worth about $3,000 a lot. The post office property, directly southeasterly across the track, contained four lots and a fraction, and sold for $12,000. I should say the station property was worth $3,000 for the same sized lots as those in the post office property, which were about 35 by 100 feet.

Just north and east of the station, the railroad is crossed by the line between sections 3 and 10, 47-27. From that point to the east 8th line in section 3, the land is worth $1,200 per lot. From the east 8th line of section 3 to the section line between sections 3 and 2, 47-27, is not a good location. The lots are worth $800 each. From the section line between 3 and 2 to the edge of the Jackson Iron Mining Co. plat, which is immediately east of the east 8th line of section 1, the land is worth about $250 an acre. Only one piece of land by Union park could be platted in that strip. Both ends could not be. Union Park is across the track from, and slightly east of, the Iron Duke, which is marked on the map. There is no uniformity of value through that strip, which is about 1¾ miles long. I have balanced the property near Union park against the balance, which is low and swampy, and cut by gullies and railroads, so that it is not possible to use it for either farming or residential purposes. I just lumped it, and called it $250 an acre.

Some portions of Union park are low; the larger portion of it is very level. The center there by Union park would have a considerably higher value than $250 an acre, taken by itself, while the ends would have a much less value, taken by themselves.

From the west side of the Jackson Iron Mining Co. plat, which is about on the east 8th line of section 1, 47-27, to Cyr. St., Negaunee, the land is worth about $300 a lot. From Cyr. St. to the east line of Pioneer Ave., the land is worth $75 a front foot on Iron St.
1188 The two lots lying between the railroad track and Lincoln St. and facing on Pioneer Ave. are worth about $2,000 each.

From the back end of those two lots east to the point where the new line intersects the old line of South Shore, which is near Healy Ave., the lots on Lincoln St. are worth about $1,200 each. The land on the south side of the tracks from that strip is level, and might be used for platting, but it is on the wrong side of the track, and is worth about $800 a lot. The Lincoln St. lots run back to the railroad on the west end, but not on the east. The lots on Jackson St. are worth more than the land behind them, where the railroad is.

From Healy Ave., extended to the track, to the line between sections 6 and 5, the land on the north side of the track could be used for dwelling purposes, and is worth $400 to $500 a lot. Immediately on the south side of the track is Ann St., which runs east and west. The lots on Ann St. are worth about $800.

From the line between sections 6 and 5, and following the railroad east for one-half mile, the land is worth about $200 an acre. From that point, which is the quarter line through section 5, going east 80 rods to the 8th line, the land is worth from $150 to $200 an acre. From the east 8th line of section 5 east to the city limits, the land is worth not to exceed $200 an acre. It is low and marshy; you can raise nothing on it but hay; it is too low for potatoes.

My values are placed without reference to mineral values, and represent only the surface values.

COOLEY.

Cross-examination.

By Mr. Eldredge:

1189 I have not dealt in lands to speak of, from Winthrop Jct. to the west city limits of Ishpeming; those lands belong to the mining company, and are not for sale. They have, however, in some instances sold the surface rights. Between Winthrop Jct. and the west city limits, there are no mine locations. From Winthrop Jct. east to the roundhouses, there are quite a number of locations. Right at the junction, they are quite thick; from there to the roundhouse, there are very few dwellings. North of the track and west of the cliff shaft, there are not very many houses; that is quite a ways north of the track. Around the turn from the junction to the C. & N. W. roundhouses, there are very few dwellings. Directly north of the roundhouse there are quite a number, but, before you get to it, there are not over six houses on the north side; they are right along the track, between it and the road. On the north side of the county road, there are a good many houses.

I take those locations right along the track into consideration when I fix a value of $200 an acre; there, it is poor for residence purposes—all cut up with tracks and rock piles, and low, marshy ground, and not suitable for lots. If the tracks were not there, that land could be utilized for dwelling purposes and would be of considerably higher value.

By "location," I mean a group of houses. Between Spruce and Lake Sts. I valued the lots as they are platted, at $800 each; they

are scarce and the buyer doesn't look at a few feet difference in frontage. The frontage on Main St. of the property where Tillson's drug store is, I valued at about $150 a front foot. It is one of the most valuable pieces of business property in Ishpeming. I am not certain about the size of those lots; I think they are 33 to 35 feet. I know of a sale of property on the corner of Main and Pearl Sts. It was the Gately lots on Man St. and sold for $7,500, according to the common talk. $500 would cover the price of the old frame building, so that the land brought $7,000 for 35 feet frontage; that makes $200 a foot.

1190 The frontage on Main St. of the Tillson property is just as valuable as the Gately property, for some purposes. Perhaps I told you that the Tillson property was worth $200 a front foot on Main St. I did tell you that they were of equal value and worth $200 a front foot, but I think that Gately paid an excessive price for that corner property; it was worth more to him for his purpose than it would be for other purposes.

The streets from the South Shore station west are First St., Main St., Pine St., Lake St., and Spruce St. I wouldn't want to put a value on that 12 foot right of way of the South Shore through that stretch, because I don't know enough about it; I don't know what it could be used for. The 12 foot strip, where it fronts on Main St., opposite Tillson's, joins the tract of land owned by the C. & N. W., and that land could be utilized all the way to the buildings on the south side of the C. & N. W. track, in case the South Shore track wasn't there. The C. & N. W. joins right onto the back end of the Jenks block. The C. & N. W. strip is a trifle over 100 feet wide fronting on Main St.

Looking at Complt.'s Ex. 15*a*, Beldon, I should say that the width of the C. & N. W. right of way on Main St. is a trifle over 100 feet.

Q. Is not the frontage of the C. & N. W. railroad on Main St. in Ishpeming, and the frontage of the D. S. S. & A. on that street, of as great value as the frontage of the business property on each side of it?

Mr. Wykes: Just a moment before you answer. I wish to object to it because the question does not present the title as it stands, the title being track rights in a street.

The Master: You may answer the question.

A. I don't think so.

1191 The South Shore property is corner property on the north side, but the C. & N. W. is not corner property. Combining the South Shore 12 feet, and enough of the C. & N. W. to make a 50 foot lot frontage on Main St., and on the corner of Canda, that lot would not be as valuable as the property next north of it. I should prefer to have Tillson's corner to that corner, because it is nearer the hotel; is a more prominent corner. It is right across the narrow street from the Tillson corner. Assuming that the 12 feet owned by the South Shore could be utilized for business purposes and made part of adjoining property, and that the lots were 35 foot front, it would be worth $125 a front foot. I think the lots are

usually 30 to 35 feet; the stores are sometimes narrower. I valued the property at that because it fronts on Main St.

Starting at the east end of Excelsior Iron Co.'s plat, which is the west line of Sec. 2, 47-27, the next property is the S. W. of the S. W. of section 2, 47-27, which is worth about $1,000 an acre, probably, for the most valuable use to which it could be put. I will modify that, as I didn't know what was included. From the section line across the forty I would put its value at $300 an acre; the street railroad runs across it; it is pretty well broken up. There is a large bluff on the north side and low land on the south side, and it is cut up by the tracks, and not as valuable.

The forty next west of Union park, which is the S. E. of the S. W. of 2, 47-27, I meant to value at $1,000 an acre; the S. W. of the S. W., which is the one west of the plat there last described, I valued at $350 an acre; the forty on which the Union park is situated is worth $500 an acre. The Union park forty is not as convenient to Ishpeming as the forty next west, which I valued at $1,000 an acre. Lots on the Union park forty which might be suitable for platting would be worth possibly $200 each, if 75 feet front
1192 by 150. As a matter of fact, none of the property can be purchased; it is held by the mining companies.

The land in the next forty east, which is the S. E. of the S. E. of 2, 47-27, would be worth about $100 an acre along the street railway track, north of the South Shore track. It could only be used for farming on the side hills, and not all of it for that. I did not have in mind the same forty which you had in mind. The forty next east of the Union park is pretty well broken up, and is worth $150 an acre. Part of it might be used for farming or pasture; part of it is fair, and the other, along the line of the South Shore, is really valueless, on account of the character of the land.

The next forty, which is the N. W. of the S. W. of 1, 47-27, is very poor land. The South Shore and C. & N. W. and L. S. & I. overhead crossing are on that forty.

The land in that forty where the South Shore runs through near the overhead crossing is low ground; that is right in the old Jackson Iron Co. location.

In my judgment, the value of the land adjoining the South Shore in that forty is not $50 an acre. It is all broken up and rocky. The road beds cut it up, and it couldn't be used for residence or farm purposes; I don't know that it could be used for any purpose. On the north side of the north line it is low ground and swampy; on the south side of the south line it is rocky bluff; between the two it is all broken ground, and the roads cut it through. The C. & N. W., the L. S. & I. and the two South Shore lines come in there. I certainly think that those railroads lessened the value, and base my price on the fact that the land couldn't be used for any purpose that I know of because of the way the railroads cut it up and the
1193 character of the land itself. If the railroads were not there and it was leveled, it might be used for some purpose.

The next forty is the S. E. of the N. W. of 1, 47-27. On the north side of the South Shore it is quite swampy, and worth about $50 an acre. The Power House of the Marquette Traction line is on

that forty, and right around it the land is fairly good. Right west of there it is very low and very swampy. There is a lake 200 or 300 yards west of the power house.

Lots 39 and 40, of Iron plat, commonly known as the Pendell plat, in the city of Negaunee, sold for $25,000. They were the Neeley lots, and had a brick building. In Negaunee, it is very difficult to buy lots of any kind for residence purposes. The property which is for sale for residence purposes is comparatively limited, unless you go outside of the now platted portions. There is very considerable demand for residence property there, and the town is growing rapidly. Three new shafts are being sunk, and it is expected that when they are opened they will employ a considerable number of men. It will then be difficult to get residence lots, unless they plat some more.

Because of the supposition that ore underlies the valley east and south of Negaunee, it is very difficult to buy land for platting purposes. I know Maitland Add. to the city of Negaunee, and should judge that lots were selling from $1,000 to $1,500 each. Ann St. lies directly south of the new line of the South Shore; I put the lots that front on Ann St. at $800 each.

The property of the South Shore between Peninsula St. produced north, and Cyr St. in Negaunee is in more of a residence portion than business portion. Between Silver St. and Gold St., it is in the business part of town north of the track, but not south of the track. The business buildings abut on the South Shore between Silver and Gold Sts. on the north side.

1194 That is also true on the north side between Gold and Cyr Sts. On the south side, the property is not for sale at all; it is held by the Cleveland Cliffs Iron Co. I valued the lots that are put on Ann St., south of the track, at $800 a lot, but don't want to value the land along the road from Pioneer Ave. east to Healy Ave., because I don't know what they could be used for.

From Cyr St. west to the end of the Jackson Iron Co.'s plat, beginning at the crossing of the South Shore and C. & N. W., I valued the lots at $300 each, for 50 by 125 feet.

COOLEY.

Redirect examination.

By Mr. Wykes:

In the course of my cross examination, when I was asked about, and answered with reference to, the fact that certain descriptions or areas were cut by the railroad, I meant that the presence of the railroad cutting through a description would, if the railroad stayed there, prevent the use of the entire description, together, either for platting or anything of that kind.

1195 On June 2, 1914.

MELVILLE W. THOMPSON, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I am 41 years of age. I am a specialist in railroad litigation, involving accounts and engineering; business address 111 Broadway, New York; formerly of Michigan. I am by profession an engineer, a certified public accountant, bearing commission from the State of Michigan, and a member of the Michigan bar; a member of the Michigan and American Societies of Certified Public Accountants, and of the American Economic Association. My professional work was preceded by about fifteen years' business experience; of which, three years bank clerk, and twelve years officer of, or partner in, manufacturing concerns.

My attention has been exclusively devoted to special professional work, in railway accounting and engineering, during the past ten years, the first five years of which, was in the service of Michigan, in the State's railway litigation, and the last five in private practice in New York City, in litigated railway cases and in examinations for financial people. The latter period also includes engagements by the Attorney General's department of Michigan totaling about one year's time; and between the two periods I was in the employ of the Interstate Commerce Commission.

The principal cases on which I have been employed by the State of Michigan are: Railroads vs. Auditor General (Michigan Ad Valorem Railroad Tax cases), Michigan Central vs. State of Michigan (Michigan Central Charter case), Attorney General vs. Michigan Central (Michigan Central Delinquent Tax case), and the present case.

1196 I was employed by State and City of New York in the Third Avenue Franchise Tax case, re franchise values, and depreciation.

I was special assistant to its Statistician and Accountant at the time when the Commission was formulating the present classifications of railway accounts under that amendment of the Interstate Commerce Act known as the Hepburn Bill, participating in all the work on the classifications of revenue, construction and operating expense accounts, and giving special attention to depreciation accounting, and accounts for outside operations.

My principal quasi-public cases in private practice in New York City were:

Central of Georgia Income Bond cases, a series of cases in which I was employed by the income bondholders to determine the true income of the railroad applicable to the payment of interest under its income bond mortgages.

Read et al. vs. Lehigh, in which I was, and now am, employed by the Stockholders Protective Committee of the Lehigh & New York Railway, a subsidiary of the Lehigh Valley, to determine the proper

distribution of revenues and expenses between the parent road and the subsidiary.

Appraisal of L. & M. S. Ry., in which I have been retained by the principal group of minority stockholders of the Lake Shore road to determine the value of its capital stock, in connection with the proposed merger of the Lake Shore and New York Central. Engaged in this work at the present time.

1197 Mountain Ice Case, a rate case in which I was employed by the Lackawanna Railroad to make separation between its costs of transporting passengers and freight.

Morristown & Erie vs. D. L. & W., a case which involves pro-rates between a trunk line and a lateral.

Syracuse and Baldwinsville vs. New York, a case which involves the determination of the capital value of a railroad's physical assets as affected by its income.

D. L. & W. vs. Kingston Coal Co., a case which involves the compensation of a coal mining company under an operating contract.

Report on the B. R. & P. R. R. Co., its value, its distribution of expenditures between operating expenses and betterments, its strategic situation in respect of coal traffic, and the value of controlled coal mines.

Report on the operating efficiency of the Lackawanna Railroad; subsequently employed to devise, and to superintend the introduction of, improved operating methods in its motive power department and repair shops.

Appraisal of the stock of the American Refrigerator Transit Company, a private car line controlled by the Missouri Pacific, Iron Mountain and Wabash railroads.

I. C. C. Express Rate cases, re cost of express service.

A number of other litigated cases and financial and engineering examinations.

1198 I may add that as my business in New York has grown I have built up an efficient organization of accounting and engineering assistants, experts in their several departments, a number of whom have been employed in extracting and assembling the details and compiling the figures presented by me in this case.

I was employed by the State for the purpose of investigating certain accounts of the D. S. S. & A., and of making certain assignments of certain of the expenses, and Defts.' Ex. 72 is the result of my work. It contains complete ratios and complete assignments and the final summary of my figures. The subject matter of pages 4 to 15 is a general description of the problem of attack, and of some of the principles directed toward its solution; also, in this portion of the Exhibit there is briefly discussed some of the methods which I considered to be fallacious that have been attempted to be applied by others to this or similar problems. Pages 17 to 25, both inclusive, contain an index of pages 26 to 43, both inclusive, the latter pages setting forth an explanation of the mode of determination of the several ratios of assignment used in deriving proportions of common accounts of expenses which should be attributed

to passenger or to freight, or to various components of passenger. That is, on pages 15 to 26 appears a statement of the ratios, and on pages 26 to 43, the details pertaining to those ratios. All of the various figures, etc., from which the ratios are derived are not set forth on these pages. I have compiled those in detail.

Pages 44*a* to 44*c* set forth a chart, or key, which makes clear in respect to each of the 116 operating expense accounts the several ratios, by number, which are used in assigning the common expenses applicable to such account, individually. To ratios
1199 which I determined, I gave a number, and pages 44*a* to 44*c* classify the application of those ratios to the different primary accounts. Upon pages 45 to 54 inclusive is set forth a tabulation, in semi-descriptive form, of the plan of my computation relating to each of the primary operating expense accounts, in detail, seriatum, an explanation in respect to each individual acount; the steps passed through to obtain final results.

On pages 54*a* to 55 is set forth a schedule of the five general accounts of operating expenses and the 116 primary accounts respectively subordinate thereto, by name. On pages 57 to 152 is set forth the actual computation by which there is distributed between the several components of the accounts those portions thereof which in my opinion should be assigned to the classifications which I have made of the expenses; that is to say, on these pages, account by account, is set forth the computation assigning common expenses to Michigan passenger, and the further subdivision of the passengers and baggage expenses to the interstate and intrastate, etc. Pages 154 to 161, are a summarization of the results.

Referring to page 45 of Defts.' Ex. 72, the table there represents my judgment as to the proper method of dividing the several expenses, described, between Michigan passenger and freight, in view of the material available to me. Taking into account the method in which the company kept its accounts, it is my judgment that this is a proper method. As to the division of Michigan passenger common expenses between passengers and baggage, mail and express and sleepers and diners, the method expressed in the table beginning on page 45 is my judgment of a proper method, and the same is true as to the division of passengers and baggage
1200 between interstate and intrastate.

When you ask me if this represents my judgment, and I say "yes", I mean it represents my judgment in view of the material available from the company's records. I do not say that, if I began at the beginning and went over a course of several years, having control of their accounting, I could not create more perfect records of the company's books, which would avail me to exercise my judgment to better advantage.

The first column sets forth the names of the accounts, with certain sub-primary subdivisions of the primary accounts. The second column, headed "Michigan Passenger," sets forth the method by which was determined the amount of each account attributable to the cost of carrying all passengers in Michigan. The third column headed "Michigan Passenger subdivided to Passengers and Baggage, Mail

and Express, Sleepers and Diners," sets forth the method by which the expense attributable to the cost of carriage of all passengers in Michigan has been distributed to passengers and baggage, to mail and express and to sleepers and diners. The fourth column headed "Passengers and Baggage to Interstate and Intrastate," sets forth the method by which the item "Passengers and Baggage," in the third column, was subdivided between interstate travel in the state, and intrastate passengers in the state.

Under the Maintenance of Way and Structures, Superintendence is divided between Michigan passenger and freight, on the results of the computation made in respect of the activities represented by the several accounts to which the superintendence was directed. These results are expressed in accounts 2 to 17 inclusive, and 22. I
1201 passed account 1, Superintendence, and obtained results from accounts 2 to 17 and 22. Then, having obtained results for the accounts last mentioned, I obtained the proportion that the several totals of their components bore to one another, and applied those proportions to account 1, Superintendence. The details for that division are on page 57. Supporting details are on pages 58 and 58*b*; further supporting details on pages 59 to 83 and 85. The primary details on which those figures are supported are set forth in an appendix, showing derivation from the company's records. That appendix is not part of Defts.' Ex. 72.

The method of division of account 1, Superintendence, between passengers and baggage, mail and express and sleepers and diners is the same as described for the division between freight and passenger. The division of the same item, between interstate and intrastate passengers, was made upon the ratio of the passenger mileage interstate and intrastate in Michigan, which is my Ratio 10.

In respect to account 2, Ballast, page 45, I found that the amount allocated to Michigan by the company for the fiscal year 1912, to which year all of my computations are directed, was excessive, relatively, to the amounts charged for the five years including and ending with 1912, and I computed an average for the five years past and used that average as the proper figure for 1912. Such average I subdivided between first, tracks exclusively devoted to passenger service, second, tracks exclusively freight, and third, tracks used by the passenger and freight services in common, my computation to obtain such results being upon my Ratio 2, equated tracks miles, Michigan, subdivided between passenger, freight and common, as set forth
1202 on page 28. I then divided the common expenses between passenger and freight on the basis of the gross ton miles respectively attributable to each, according to my Ratio 1, set forth and explained on pages 26, and 26*a*. In describing my computations, I confine myself to Michigan as to steps which succeeded the allocation of costs to Michigan.

Having obtained the total passenger expenses, I subdivided it into three groups, passengers and baggage, mail and express and sleepers and diners, upon the basis of the gross ton mileages respectively attributable to these three sorts of service, upon my Ratio 1*a*, set forth and described on page 27. Having obtained the sum at-

tributable to passengers and baggage in Michigan, I subdivided it between interstate and intrastate passengers in Michigan on my Ratio 10, set forth on page 36.

Having obtained my final results I carried them to the summary at pages 153 to 161, in which all of my final results are summarized. In all divisions of passengers and baggage between interstate and intrastate, I applied Ratio 10, with the exceptions of accounts 54, Outside Agencies, 55, Advertising, 106, Salaries and Expenses of General Officers, 107, Salaries and Expenses of Clerks and Attendants, 108, General Office Supplies and Expenses, 109, Law Expenses, 113, Stationery and Printing, 114, Other expenses.

With reference to Ballast, I refer to Ratio 2, equated track miles, Michigan. This is subdivided between passenger exclusive, freight exclusive, and common. My method of determining this ratio was as
1203 follows: The main tracks in Michigan, being main line and branches, traffic spurs was classified as passenger and freight common, and freight. The freight was further subdivided into merchandise and ore. The second track was designated as main track, passenger and freight common. The sidings were classified into passenger exclusive, freight exclusive, and passenger and freight common, and the freight sidings were classified into merchandise and ore. The mileage of each class was taken from the Riggs appraisal. Changes in mileage during the fiscal year 1912 were ascertained and one-half of the net increase added to Riggs' figures. The mileages of the main and of side tracks were then equated on the basis that one mile of main line is equivalent to three miles of side track. Having obtained the totals of the several classes, in terms of mileage, by the method explained, the proportion existing between them as expressed in terms of percentage; i. e., treating the total as 100 per cent. I found that tracks used in the passenger service exclusively amounted to .09% of the whole, tracks used exclusively in freight to 13.32% and in common passenger and freight to 86.59%.

The purpose of Ratio 2 was to ascertain the track mileage in Michigan and the use to which the track mileage was devoted, in order that certain expenses might be assigned against the classes of traffic to which they should be charged. The purpose was in part to facilitate the setting off to exclusively-used track the expenses appertaining to that track.

I set forth a general description of Ratio 1, on pages 26 to 26*a*
1204 which will explain the general method of determining this ratio. The purpose of determining the ratio was to discover the proportions in which expenses of maintenance due to mechanical wear should be apportioned between the classes of traffic to which such wear was attributable. In my description of Ratio 1 on page 26, the term "tare weight," is the weight of the car with no load. The term "live weight," or "live load," means the load carried in the car. The passenger train load was assumed as ten tons, meaning the total weight of the passengers, baggage, mail and express matter carried on a passenger train. I estimated that the average weight would not exceed ten tons, and think that a safe estimate. Ten tons is more than the actual average weight, and would tend to increase the pas-

senger percentage and the charge against the cost of carrying an intrastate passenger.

I applied the gross ton mileage ratio to Ballast, because in my opinion the renewing of ballast is attributable in greater part to mechanical wear by the passage of trains than to any other agency, as the effect of time, in the sense of weather stress, causing erosion. I have in each of my several computations taken as the determining factor which decided me in the use of one ratio as against another, e. g., the gross ton mileage ratio, which reflects mechanical wear, in contradistinction from the time ratio, which affects decay attributable to the passage of time. Thus, while I recognize that a portion of the cost of replacing ballast follows erosion due to the elements, I consider that the cost of replacement is in far the greater part attributable to the mechanical wear caused by the trains. Therefore, following my plan, I have in each case taken the principle proximate cause and made my computations on the basis of that controlling element.

1205 The ratio of mechanical wear as between passenger and freight and the ratio of time use of tracks are so nearly alike that the use of either in place of the other for any portion of one of the accounts, would not produce a material difference in the final result.

Ratio 1 subdivides between passenger and freight, and Ratios 1*a* and 1*b* subdivide passenger into passengers and baggage, mail and express and sleepers and diners. Ratio 1*a* contemplates all trains on the plaintiff's tracks, whereas Ratio's 1*b* does not take into cognizance trains of other companies on plaintiff's tracks, but does include plaintiff's trains on the Mineral Range July, August and September, 1911. Those variations were made for application to different items of expense.

The method of obtaining Ratios 1*a* and 1*b* are set forth, on pages 27 and 27*a*, in sufficient detail to be understood. The purpose of these ratios was to determine what share of expenses attributable to passenger trains should respectively be assigned against passengers, and their baggage, on the one hand, and against mail and express and sleepers and diners.

I do not regard the cost of haulage of mail and express or sleepers and diners as any component part of the cost of transporting intrastate passengers with respect to a given statutory rate of fare applying to the latter.

The method applied to the division of the items, Ties, Rails, and Other Track Material, Under Maintenance of Way and Structures, is

1206 the same as that described for Ballast. My judgment is that the predominant cause of the expenditure is the mechanical wear. I apply the gross ton mile ratio to the division of those expenses which result from mechanical wear because it is my opinion that the destruction of track structure is a function of the gross ton mileage passing over the track; that is to say, the weight of the trains is the main determining factor causing injuries to the track which require repairs and consequent expenses expressed in these accounts. The wear varies with the gross ton mileage, though not exactly. I think the wear due to freight trains is greater in proportion to the ton

mileage thereof than that attributable to passenger trains in proportion to their ton mileage. I have not weighted my ratio by any factor expressing such variance, but have taken what I believe to be a minimum. If I had weighted my ratio according to what I have just said, I would have thrown an increased amount of expense against freight and a decreased amount against passenger. Ratio 4, time, is described on page 31, Defts.' Ex. 72; its purpose was to determine the proper distributions between passenger and freight of those costs which run to time and are not effected by mechanical wear. In respect to costs that are effected by mechanical wear, it is my opinion that they should be charged against the service producing the wear, but in respect to costs not effected by mechanical wear it is my judgment that they should be assigned against the several traffics in the proportion of the time through which these traffics avail of the facilities afforded.

The time ratio expresses that as between passenger and freight. Time ratio 3 expresses the like in respect to subdivisions of passenger
between passengers and baggage, mail and express and
1207 sleepers and diners. When I say "passengers and baggage,"
I pluralize the "passenger" and mean the intrastate and interstate passengers, not in sleeping cars, in Michigan.

I have applied this time ratio, in general, to all expenditures which are the result of time and the elements and deterioration due thereto. Where I considered the majority of the number of dollars expressed in the account to be so attributed, I applied the time ratio to the total account. I reduced these different elements to ratios, in some cases because the company's records were insufficient (notwithstanding the fact that they might have been made sufficiently precise to avoid the necessity of computation by percentage assignment), but in other cases because the costs in question are not of a sort that can be reduced to precisely itemized accounts and require to be assigned between different services by methods of computation. What I mean by that is that respective wear of rail heads, for instance, caused by freight and passenger trains cannot be carried in the accounts item by item for the train, for each rail, and therefore has to be determined in a scientific manner by engineers and accountants and computed as between the respective services.

In getting at my time ratio, I computed the delays caused to freight trains by passenger trains and obtained the percentage thereof to the elapsed time of the freight trains between terminals, and I found that the delay so caused was 2.75 per cent of the whole time of the freight train, and I decreased the freight train time of occupancy accordingly. I did this for all of the trains on a series of representative dates to obtain from a series of dates results that
1208 would be approximately the same as would be obtained by a
computation for the whole year. I took seven days, 15 days apart, namely, March 30th, April 15th, April 30th, May 15th, May 30th, June 15th, and June 30th, all in 1912, which I thought sufficiently representative.

The figures in Defts.' Ex. 72 are all for the fiscal year July 1st, 1911, to June 30th, 1912.

Ratio 3, by which I divided certain expenses under Roadway and Track, and similar items between passengers and baggage, mail and express and sleepers and diners, was applied for the same reason as expressed regarding Ratio 1*a*. My reason for applying Ratio 3 to certain cases instead of Ratio 1*a* is that Ratio 3 applies to elements which proceed with the passage of time, whereas Ratio 1*a* applies to elements which proceed with mechanical wear, and the application of that ratio proceeds upon the basis that the amount of time occupancy of a car used in carrying express, or baggage, or mail, is the equivalent of the car carrying passengers. In my judgment, it is a proper cost accounting to so divide such expenses.

In item 7, under Maintenance of Way and Structures, Removal of Snow, Sand and Ice, I divided the common expenses between Michigan passenger and freight on the basis of Ratio 4, based on time of use. Before applying Ratio 4, I applied Ratio 2*a*. Ratio 2*a* is one of my equated track mile ratios; it is similar to my basic track mile ratio 2, but different in that exclusive ore tracks are excepted in Ratio 2*a* and I applied Ratio 2*a* to the equating of track mileage in respect of the removal of snow, sand and ice, because an investigation of
1209 that account indicated that but a small amount is charged to months of ore business.

In Account 7, Bridges, Trestles and Culverts, I divided common expenses on Ratio 4, expressing time-use as the expenses of their maintenance in the main run with time, and not mechanical wear. Under Michigan passenger, for that item, I adopted the company's own allocation; in fact, with very few exceptions, I adopted all the company's allocations of expenses to geographical localities or to distinct services. For accounts 11 to 14 inclusive, the plan of assignment, as stated by me on pages 45 and 46, expresses what I did and what I regard as proper.

Item 16, Buildings, Fixtures and Grounds, is subdivided by the company into several primary and sub-primary accounts, as set forth on page 76. We assigned the common items attributable to each of those several divisions on bases we thought appropriate to the several cases; thus, sub-division A, Shops and Storehouses, being maintenance of the railroad's repair shops, in which the equipment is repaired, and storehouses, in which supplies are carried, we subdivided on the same basis as account 24, Superintendence under Maintenance of Equipment.

The reason was, we considered the use of the shops and storehouses would substantially follow the superintendence, applied to operations conducted therein.

The sub-account Roundhouses and Turntables we subdivided between passenger outside and within Michigan on the basis of the total of our subdivision of accounts 72 and 81, Enginehouse
1210 Expenses, Yard and Road, it being our opinion that this form is a suitable basis of distribution of the expenses. Having obtained, thereby, costs attributable to Michigan passengers, they were subdivided between passengers and baggage and mail and express on Ratio 1*a*, which in our opinion was a suitable ratio for application at this point.

The next item, sub-account C, is station buildings and grounds. The common expenses were distributed between passenger and freight on the basis of occupancy of the buildings, as determined by an analysis of the station payroll, Ratio 17, page 43. The next subdivision of account 16, being sub-primary account B, Section, Hand Car and Other Houses. The Michigan total was distributed against passenger, freight and common on equated track mileage, Ratio 2. The common expense thereby determined was distributed to passenger and freight on gross ton miles, Ratio 1, as, in my opinion, the expenses attendant upon the section houses, etc., followed the principal division of the expenses in respect of the track laborers, which followed the wear on the track. We then subdivided between passengers and baggage, mail and express and sleepers and diners on gross ton miles, Ratio 1*a*.

Subdivisions E, Coal Sheds and Trestles, and F, Water Tanks and Pump Houses, I distributed on the same basis as accounts 73 and 82, Fuel for Yard and Road Locomotives, my reason being that coal sheds and trestles handle coal consumed in the several services, and should follow like distribution. Water tanks and pump houses supply water which is evaporated upon the burning of the coal, and should follow like distribution. The next subdivision on ac-
1211 count 16 is sub-primary account G, Track Scales. This is all attributed to freight. Sub-primary account H, Fixtures, I have distributed in the same proportion as the total results of my distribution of sub-accounts A, B, C, D, E, F and G.

Account 17, includes charges against the Marquette ore and merchandise Docks, which are exclusively freight, and assignable thereto. The remainder of account 17 is St. Ignace, merchandise and slip docks. This is mostly freight, and entirely incident to the Mackinaw Transp. Co., under outside operations, and no part is chargeable to intrastate passenger.

I distributed accounts 18 to 22 inclusive in the same manner as Superintendence, already explained. These accounts are of a general nature, and the same principles that apply to the distribution of superintendence expense apply. They should follow the distribution of the charges for the work done to which they were incident.

Account 23 is a credit to, or reduction of, accounts 2 to 16, and I apply the credits in the same proportion in which I applied the charges against those accounts.

Item 24, Superintendence, Maintenance of Equipment, divided on the basis of the results for accounts 25, 31, 34 and 43, being Steam Locomotives—Repairs, Passenger-train Cars—Repairs, Freight-train Cars—Repairs, and Work Equipment—Repairs, and of the account for sleeping, dining and special car repairs included in outside operations. Item 25, Steam Locomotives—Repairs: Ratio 13, set forth on page 39 of Defts.' Ex. 72, was arrived at from an actual inspection of the time books of the switching and
1212 locomotive men for the entire year. Ratio 13 subdivides the total switching service in Michigan, into passenger and freight, and, Ratio 13*d* subdivides in Michigan and extra Michigan the total system switching.

Ratio 14, applied in the division of item 27, is revenue passenger locomotive miles of the system, subdivided between Michigan and extra Michigan, and is a computation based on Mr. Delf's figures.

Accounts 31, Passenger Train Car Repairs, and 33, Passenger-train Cars—Depreciation: In the subdivision of total passenger, between passengers and baggage on the one hand and mail and express on the other, we arbitrarily adopted the respective percentages of 85 per cent and 15 per cent, as, in our opinion, the repairs and depreciation to coaches and baggage cars constitute a larger proportion of the whole than do the same for mail and express cars, relatively to the proportionate mileage of the two classes. They are percentages which would show a larger amount to passengers and baggage and a smaller amount to mail and express than would be developed by the computation of the car miles of the two classes. The car mileage percentage in respect of mail and express cars would be about 20%, whereas I have taxed their operations with about 15%.

Account 61, Superintendence, under Transportation Expenses: I have taken the system total subdivided it into Michigan passenger, following that of the passengers and baggage, mail and express and sleepers and diners, and then subdivided on the ratios produced by the sum total of all allocations and distributions of all of the other accounts under Transportation Expenses, being accounts numbers
62 to 105, except 94 and 97, which are distributed on the same
1213 basis as account 61.

Continuing through my plan for subdivision of expenses, beginning with account 62 and ending with 116, I think, if those items are read in conjunction with the detailed explanations which appear on pages 114 to 143 of Defts.' Ex. 72, they are self-explanatory.

Pages 30 and 31, Ratios 3*a* and 3*b*, are variants of Ratio 3. Ratio 3 subdivides passenger train car miles in Michigan, on D. S. S. & A. tracks only, into the three groups, passengers and baggage, mail and express and sleepers and diners, and is intended to base its distribution on the factor of time of use of the tracks by the several constituents of the trains.

Pages 4 to 15 inclusive of Defts.' Ex. 72, which I in general described this morning, was prepared by me. It represents a short statement of my views.

On page 159, Defts.' Ex. 72, the first entry in figures is to be read as follows: Operating expenses attributable to intra Michigan passenger traffic, 1912, total $209,422, that being the amount which in my opinion should be attributable to such expenses.

The amounts stated at the foot of the recapitulation on page 158, under the columns "Sleepers and Diners," "Mail and Express" and "Passengers and Baggage," express my judgment of the cost of doing those several classes of business in Michigan.

The amount $534,799, under "Michigan Passenger," is the amount
that I arrived at as the Michigan passenger expense, meaning
1214 thereby the total passenger expense in Michigan of all classes, including therein intrastate and interstate passengers. The

figures in the recapitulation include the assignments which I have made and the allocations of the company which I have adopted.

The workk was done by me and a staff of my employes. The principles upon which the work should be done were established by me, following conferences with my men and following examinations into the records, for the purpose of determining the extent of perfection or imperfection thereof. The actual extraction from the company's records of figures, being entered on our working papers, became a part of our records, was done by individuals in my employ and under my direction, and under the immediate direction of one of my engineers, in charge.

The figures appearing in Defts.' Ex. 72, offered in evidence, are immediately derived in all cases either from exhibits placed in evidence by the plaintiff in this case or from figures appearing upon the compilations from the company's records. They can be traced back either to the plaintiff's exhibits or to the supporting figures in my own compilations, and through the latter to the company's records. The starting figures used, are in all cases based on the company's records. The computations therefrom are based upon the company's records, but are worked out according to principles which I approved or constructed. The aggregate of each of these items of account which I have subdivided are the same as the aggregate furnished in Mr. Delf's exhibit for the same period. In respect of the account Ballast, instead of taking Mr. Delf's figures for 1912 alone, I took the average for five years. I eliminated from the account General Expenses the directly-charged expenses attributable to this case.

1215 The elimination of the St. Ignace docks and wharves expense I have already mentioned.

I considered the propriety of the use of the revenue train mileage basis for the purpose of dividing common expenses between passenger and freight. I think it is not a proper basis. My reasons in general are because the train mileage basis is a single measure applied to a complex set of circumstances, and this fact alone is sufficient to condemn its use.

In connection with what I have just said, I may say further, Mr. A. Hamilton Church in his book entitled "Production Factors in Cost Accounting and Works Management," which presents an elaborate explanation of the author's views as to the methods of apportioning indirect expenses, at page 172, he expresses himself in language which I desire to adopt as expressing my views in respect to the question I am now answering. He says, referring to his analysis, "It will probably be objected that this is a very complex and formidable way of presenting costs." He then goes on to say, in respect of so-called simple methods of attaining the desired end: "The answer is that in actual practice it (the detailed method) is not as difficult as it looks, but a still more complete reply to the objections is that no method that fails to provide the information in this detailed form is anything more than a sham. No facts that are in themselves complex can be represented in fewer elements than they naturally possess. While it is not denied that they yield no good results, it must still be recognized that there is a minimum of

possible simplicity that cannot be reduced without destroying the value of the whole fabric."

1216 The same author uses somewhat similar language in his book entitled "Expense Burden," at page 114, which I also adopt as expressing my views on this subject: "A few final observations may be offered on the subject of works accounting generally. Modern methods have taken their rise in the growing complexity of modern industry. They, like the industry itself, tend to become more complicated in proportion as the numbers of their factors increase. The snare of the simple system must therefore be avoided. * * * And just as the whole science of navigation hinges on higher mathematics, so the management of a considerable business turns upon intricate principles which are the horror of the rule-of-thumb men and sheet anchor of the progressive men of business." In final answer I say that in my opinion the use of the train mileage basis is a generalization not applicable to the facts here, and it does not produce a result which approximates the truth.

The truth of the results produced by the train mileage basis, or the degree with which the results of that basis would approximate the truth, would vary with the train loads, and with train constituents and with weights, the number of wheels and wheel impacts, and all of those various items, and with a cumulative condition of such circumstances it would vary greatly.

It is my opinion that the two classes of train miles (freight as compared with passenger) are not similar in cost or expense to produce, and I am of the unqualified opinion that, on the average, the freight train miles on this road are more expensive to produce than are the passenger train miles.

1217 In my judgment, the greater speed in the passenger service has more tendency toward the effect of making the passenger train mile cost greater, but it is not sufficient to offset greater freight cost due to certain elements; nor is it sufficient, when taken in connection with the other elements which might fairly be placed on the same side of the scales, to offset the elements which belong on the freight side.

In my judgment, and directing my reply to track structure of the plaintiff's road in the condition in which it is maintained for the freight service as well as for the passenger, variations in speed of passenger trains below 30 miles an hour do not produce a sensible variation or augmentation of injury to the track. I think that at speeds exceeding 40 miles per hour the damage to the tracks becomes sensibly augmented. At a speed above 40 miles an hour the damage to tracks produced by the element of speed, and described by engineers as due to the dynamic augment of the static load of the train, begins to increase noticeably, and increases very materially at high speed, say, speeds 60, 70, 80 or 90 miles an hour, but those speeds are not made on this railroad, with rare exceptions in the case of 60 miles, for short distances. Between 30 and 40 mile speeds, there exists an intermediate condition; in some instances there might be an appreciable difference in the injury to the tracks between 30 and 40 mile speed and in other intsances not. depending upon the condition of the equipment and the condition of maintenance of the tracks at different seasons of the year or on different stretches of

the road. The average speed of passenger trains is about 27 miles an hour, and freight about 16 miles an hour. Those are the result of computations I have had made, and they refer to the
1218 actual speed per hour when the trains are moving.

On this subject, I have caused the Library of the American Association of Engineers, in New York, and other libraries to be carefully searched and all discoverable information on these subjects extracted and furnished to me, I have caused the subject to be analyzed mathematically, I have discussed the subject personally with, and obtained all the information that I could from, a number of engineers who have devoted themselves to the subject of maintenance of way and to the strength and destruction of track structures, and I have come to my conclusion as the result of my own analysis from all of the information on the subject that I have been able to gain through these sources.

Q. Now another one of the elements which appears in the testimony in this case as causing the passenger mile to be more expensive is that greater refinements of track are necessary to meet the needs of the passenger service, in that the roadway and rails must be kept more smooth.

A. The point would be well taken if this were a road running fancy trains at high speeds, like the Lake Shore, but it doesn't run such trains. I think the point is not well taken on this road, given the speeds at which it does run its passeger trains; i. e., I think the necessary refinements of track required to prevent the freight traffic from being unreasonably destructive to the track are sufficient to provide for the requirements of passenger trains running at the speeds of the passenger trains on this road, which, as I have stated, average 27 miles an hour and exceed 40 miles an hour in comparatively few instances, and then only on short stretches of track.

1219 The Master: Would you say, then, that if there were no passenger service on this road, the road would have to be kept in as good condition as it is now, merely for the freight service?

A. I think substantially so; if not exactly, then very nearly so. It is the opinion of practical maintenance men whom I have consulted that up to passenger speeds of 40 miles an hour the condition necessary for the maintenance of the freight service is sufficient for passenger service.

Q. Another element claimed to make the passenger train mile more expensive is the super-elevation of the outer rail at curves to meet the needs of the passenger service, the elevation being claimed to be too high for the necessities of the freight service and so high as to cause extra damage to the curve and track by the freight train; what can you say as to that point?

A. I think the point is raised on theoretical, rather than on practical, grounds. It is manifestly true that where the outer rail is elevated for passenger speeds, and the freight trains run around the same curves at lower speeds, the freight trains tend to ride more heavily on the inner rail than on the outer rail. This riding on the inner rail manifests itself mainly in the imposition of greater weight upon the top surface of the head of the rail, which tends to cold roll the rail, and harden it, rather than to wear it. The fact is that the

greater wear of the rails on curves on this railroad is to be found on the outer rails, not on the inner rails, this wear appearing particularly at the inside edge or side of the head of the outer rail, due to
1220 flange cutting; this is caused by the tendency of the wheels and trucks to continue on the tangent rather than to follow the curve, commonly referred to as the "nosing" of the rail. The wear of the rails on curves, relatively to the wear of the rails on tangents, will average about as follows, namely, that the wear on outer rail on the curve will be about 20 per cent, and the inner rail five per cent, above the wear on the tangents, being a ratio of four to one of wear on the outer rail as against the wear on the inner rail.

Q. Would the elevation of the outer rail, be the cause of greater wear of that rail by freight trains, or would the wear be equal if there were no elevation?

A. If there were no elevation, the wear would be greater on the outer rail because of the tendency of the moving body to continue in a straight line. The car wheels are immovably attached to their axles and as the train passes around a curve the outer wheels travel over a greater distance than the inner wheels. The result is that one set of wheels or the other slips on the rails, and those wheels slip in respect of which there is the least resistance. The tendency, in the way the tracks are constructed, is for the wheels to slip on the outer rail, and to grind off the upper surface of the head of the rail and wear on the same caused by slippage, as contradistinguished from the flange wear on the inner edge of the head of the outer rail caused by nosing.

The curve causes the slipping; the elevation has nothing to do with the fact that slipping must take place; the slipping might be transferred from the outer rail to the inner rail, if the outer rail were depressed.

1221 It is generally considered better practice to elevate the rail for the maximum service. The elevation of the rail simply restores on the curves the level condition of the straight tracks; i. e., the two rails being level on a piece of straight track, and the outer rail being elevated on a curve for a speed of 60 miles, the effect then, as the train passes around that curve, is that the track is relatively level.

It is the practice, after the outer rail has become badly worn on the inner side of the rail head, to exchange the rails on the curve; i. e., put the outer rails on the inside and the inner rails on the outside of the curve, thereby getting the benefit of the unworn condition of the inner rail.

Q. Another element claimed to make greater cost per train mile for passenger service is the removal of snow; it is said that the needs of the passenger traffic, and the fact or claim that the road must be kept open for passenger traffic, necessitates the putting on of snowplows and keeping it open for the passenger service, when that would not be done for the freight service?

A. I do not agree with that. If the snow is permited to drift and pack in the cuts, the trouble and expense of removing it becomes much greater. Therefore, the economical method of removing the snow is to get busy with ths snowplows, as soon as it begins to snow, and keep the track clear. It is my judgment that the cheaper prac-

tice in respect to main tracks is to keep the snow off as it comes, and keep the road clear and open; that is the only feasible prac-
1222 tice, and would be followed if there were no passenger trains, if the highest economy were desired.

There is a good deal of work removing snow that requires to be done by hand, in any event, i. e., the removal of snow by shovel from the switch points and the frogs. This cost is greater in freight than in the passenger service, because of the greater number of switches devoted to freight service. It is greater also relatively to the train mileage.

Q. There is an element which has been claimed to make the passenger service more expensive, in that the trains running on a single track must pass each other; the passenger service, being preferred, the freight trains must take the siding and wait for the passenger, and that that expense should be borne by the passenger service. What can you say as to that?

A. I think the argument is a good one; I think it is sound, and remains a question of fact; I found that on this road it is a fact. Not all the delays occur for the reason that you speak of; there are delays of a contrary nature, although much less in number. I, however, recognize the fairness of this point, and computed the amount of delay in freight trains attributable to the necessity of granting superior running rights to the passenger service. I found that this amounted to approximately 2.75% of the running time of the freight trains. The result of my general study of the subject is that I think this factor is not sufficient to offset the contrary factors (elements of greater freight cost) and thereby cause the train miles to be a suitable measure of division of common expenses.

1223 Q. Incident to the freight train taking the siding for the purpose of permitting the two trains to pass, it is claimed that there is wear on the track structure and equipment and use of fuel. What can you say as to that?

A. This cost is a necessary incident of operating passenger and freight trains on a single track. It is manifestly necessary for one or the other of the trains to take the siding, but the costs incident upon its taking the siding are no more chargeable against the one service than the other; they should be equally apportioned between the two.

Q. It has been shown that a considerable amount of company material moves in freight trains, the exact extent of which is not shown. Are there any offsetting elements on the passenger side which would tend to equalize the cost of carrying company material in freight trains?

A. The cost of hauling expedited shipments of company material for use in freight service and in common service, which are carried in passenger trains; furthermore, the cost of hauling employes in passenger trains, to the extent that these employes are regularly employed in freight service or in common service. Free carriage of employes not on company business is granted by the company, because by such granting of free transportation it obtains the services of such employes at lower wages than it otherwise could, which is the universal reason advanced by railroad companies in favor of the

granting of free passes to employes and in favor of the exchange of passes with other railroads for their employes. Analogous, is the transportation of employes of other companies upon official
1224 business and on pleasure trips or their personal business, and also the free transportation of certain government officials in passenger trains, the same being a charge against all classes of service; likewise the transportation of officers of ele-mosynary institutions and the hauling of private cars of officials of this or other roads.

Q. Now, referring again to the question of speed, it has been claimed that the greater speed of passenger trains causes a greater impact on the bridges than the freight trains, and that there is a cost which is greater per passenger train mile than per freight train mile. Is that, in your judgment, true?

A. It is my opinion that the greater impact upon bridges due to greater speeds is immaterial, in respect of bridges of longer spans than 50 feet, but that, in respect of bridges of shorter spans than 50 feet, the increased dynamic effect attributable to speed becomes material, at speeds of 25 miles per hour. But, on the other hand, it is my opinion that the cumulative effect of trains composed of many units is greater than the effect in respect of shorter trains; that is to say, that the bridges are less affected by the impact of the wheels under short passenger trains than by the repeated impacts of the wheels under long freight trains, which latter not only cause a cumulative vibratory effect, but also cause an additional effect in that the repeated shocks overcome the inertia of the structure. The greatest impact is that of the locomotive; in the case of long freight trains with heavy loaded cars, there is a succession of impacts that sets up a cumulative vibratory effect.

Q. Are there, taking the other side of the proposition, certain elements or things which weight the freight side of the problem and which make the revenue freight train mile greater in
1225 cost than the passenger train mile?

A. I will state them, and having done so, I will explain those that you desire to have further elaborated:

(*a*) The greater tonnage of freight trains.

(*b*) The greater number of wheels and wheel impacts of freight trains.

(*c*) The greater weight, on the average, and the greater tractive force required, of locomotives of freight trains.

(*d*) The fact that wheels, trucks and parts are not kept in as good condition on freight trains as on passenger trains.

(*e*) The greater axle loading of freight train cars.

(*f*) The greater time through which the property is used by the freight trains, because of their lower rate of speed.

(*g*) The greater wear on track, both in the straight and on curves, attributable to the fact that freight train trucks are more rigid than passenger train trucks.

(*h*) The fact that a greater number of derailments and injuries to the track, ties, etc., occur in the freight service.

(*i*) The differences in the types of the passenger and freight loco-

motives. The principal differences in these, both of which tend on the average to increase the expenses attributable to freight traffic, are, first, the higher center of gravity of the average freight engine used on this road, which increases the rocking of the engine upon its springs and augments the dynamic impact upon the track, and second, the greater number of drivers in the freight locomotive, which produce a cumulative effect in respect of the dynamic
1226 augments due to imperfect counterbalancing and to the increased weight of side and main roads.

(*j*) The carrying of persons free by the passenger trains in respect of employes in both classes of the service, and also in respect of employes of other roads carried on exchanges of passes, and the free transportation issued for civic and charitable reasons.

(*k*) The hauling of business and private cars by passenger trains.

(*l*) The sustaining through the passenger expenses of services not remunerative in the sleeping and dining car service.

(*m*) The exclusive use by the freight traffic of large amounts of mileage of line, sidetracks, and spurs not used in the passenger traffic.

(*n*) The greater use of yards and terminals by the freight traffic in switching.

(*o*) The presence of some degree of double and triple tracking supplied to meet the necessities of freight service.

(*p*) The use of the main tracks by the freight service in switching operations, in greater proportion than in passenger service.

(*q*) The more frequent starting and stopping of freight trains in road switching.

(*r*) The fact that switching done by road locomotives is not represented by road train mileage, nor until one hour is reached in each instance does such mileage appear in the switching records.

(*s*) The fact that expenses which would peculiarly follow
1227 the train movement, and which have been allocated, do not follow the train mileage ratio.

(*t*) The expenses of the car accountant's office, which would follow the number of cars, rather than the road train mileage, and likewise the cost of inspection of cars at interchange points. Furthermore, although there are but 67 passenger cars, whereas there were 3,003 freight cars on this road, the expenses of the car accountant not only would not apply upon the ratio of the revenue train mileage but they are also greater per car for the freight cars than for the passenger cars, as the freight cars travel all over the United States, as it were, and have to be kept track of everywhere, and this is not the case in respect to the passenger cars.

(*u*) The greater length of passing tracks, which must be maintained to accom-odate the greater length of freight trains, because freight trains must pass freight trains as well as pass passenger trains.

(*v*) The greater cost of maintenance of the main line due to the frequent presence of freight switches. This also applies to common sidings from which freight tracks lead off.

(*w*) The greater number and the greater use of switches on freight sidings.

(*x*) The greater cost of switch ties, in connection with the use of switches for freight traffic only.

(*y*) The higher center of gravity of freight cars, and particularly of ore cars.

(*z*) The stational cost of freight movement, in the sense that freight cars are moved superfluously in the switching move-
1228 ment of other cars.

(*aa*) The greater damage due to track and equipment caused by the greater number of flat spots on freight car wheels than on passenger car wheels.

(*bb*) The greater injury to the tracks due to the reciprocating motion of the engine, sideways, which is caused by the fact that the power is alternately applied through the cylinders on the two sides of the engine, and this element of injury varies with the tractive effort expended by the engine, and is greater at slow speeds than at high speeds.

Q. Taking all of these things which you have said weight the cost of producing the revenue freight train mile, and taking into account also the things which are said to increase the cost of producing the passenger train mile, and which you have analyzed, which in your judgment is the more expensive revenue train mile to produce?

A. It is my opinion that the freight train revenue mile is more expensive to produce on this road than the passenger train revenue mile. I think it is considerably more than twice as expensive to produce the freight train revenue mile than the passenger train revenue mile.

The imperfections of the equipment devoted to the freight service constitute the principal cause of difference in expense, over and above the differences in the train weights. I think the element of train weights is the first main element, and that this element can then be multiplied by some of the other elements, of which the most important one in my opinion is the relative inferiority of
1229 design and of perfection of maintenance of the freight equipment. There are several such differences; the car wheels in the freight service are not run with their axles as nearly parallel as are the car wheels in the passenger service; that is to say, the freight trucks get out of square, as the Master Car Builders use the term, and the effect is to injure both the tracks and the wheels. The principal effect, however, of the trucks getting out of square is a great increase in the nosing of rails. The construction or the design of the freight trucks is inferior to that of the passenger trucks.

Another element which is responsive to the question is this: The wheels under the freight cars are all chilled iron wheels, whereas the wheels under the heavy passenger cars are mainly steel-tired wheels; steel-tired wheels are turned to approximately a true round, a true circle, but chilled iron wheels cannot be turned after chilling, and they are eccentric, they are egg shaped, and vary from a true circle. One of the principal deleterious effects of this varying from a true circle is that the irregular wheels are more apt to freeze in the brakes, and to slide on the tracks. This causes what are called slid

spots, both on the tracks and on the wheels, and produce- further injuries both to tracks and to equipment. Along the same line, although not directly due to the imperfections of the wheels, are the circumstances that the system of suspension on springs is quite primitive under the freight car and is elaborated under the passenger car, and thus the shocks both against the equipment and against the rails are greater in respect of the freight equipment, and that the freight trucks do not turn as readily upon the centers as do
the passenger trucks, this being due to two general causes,
1230 the first being that the construction of the passenger trucks at and near the king bolt is such that they revolve more readily, and the second being in the side bearings; i. e., the points where the sides of the car bear down upon the trucks when there is a list of the cars. The passenger cars usually have roller side bearings, whereas the freight cars do not, and it is of frequent occurrence that the loads in the freight cars shift and cause the freight cars to come down on the side bearings, and the result is that the freight trucks cannot swing as they otherwise would, and this increases greatly the nosing of the trucks under the freight equipment.

There are a number of items of cost in respect of which the relative costs attributable to the interstate and intrastate passengers vary, one with the other; that is to say, in some regards there are larger costs attributable to interstate passengers, relatively to passenger mileage, than to intrastate, and in others the reverse condition obtains. I think that the principal element of the addition to cost of carriage of interstate passengers and intrastate passengers, both relatively to the passenger mileage, is to be found in the conditions on the Western Division of the road, where the interstate business is much greater than the intrastate business, and where the total of the passenger business is light and the expenses correspondingly large. There are factors which go to increase the expense of intrastate or interstate business respectively, but the company has no records which would permit me to work this up. I did find, in examining the company's statistical records of passenger miles, that the average length of haul of the intrastate passenger was decreased, as shown by the records, below what it actually should have been in instances
where the same passengers and the same trip pays two fares;
1231 that is treated as two passengers making two trips. I also found that the average length of passenger haul was somewhat decreased by reason of the company's performing what is substantially a suburban street car traffic between Marquette and Dead River.

There are other items of expense which are relatively different in the two services, but in respect of which there is no record, as, for instance, the relative cost of selling tickets. There are more tickets sold per passenger mile in the intrastate traffic than in the interstate traffic. These tickets are largely card tickets, although card tickets are also sold in the interstate business, particularly between points on the company's own lines. The cost of selling interline tickets is greater in some respects than the cost of selling card tickets and interline tickets tend to be sold more largely in the interstate busi-

ness than do card tickets. The cost of accounting for interline business is considerably greater than for tickets for passengers on the company's own lines, alone, and these costs tend toward interstate and away from intrastate, business. There are a number of other items of this sort which are individually without great weight, and in respect of which the particulars for determining the exact facts do not exist, because in order to determine such facts an accounting of the statistical system will have to be devised in advance in such a manner as to reflect these facts, and to allow an analysis thereof.

Q. And I gain also from what you have said that you think the excess cost in interstate passenger business on the Western Division would offset any possible excess of cost in intra passenger business on the other division.

1232 A. I think that, in view of the expenses that have to do with more expensive car service (sleepers and diners), the item of excess would be offset.

The Master: Is it your judgment that the expense of the interstate passenger on the Western Division is greater than the expense of the intrastate passenger, based on any capitalization?

A. Yes sir. The effect of a greater volume of traffic in a particular service is to produce less cost per unit relatively to the cost upon a smaller volume of traffic.

Q. What, in your judgment, is the proper method to be applied in dividing the commonly-used property between passenger and freight services?

A. I think that the capital division, or the division of capital invested in the property respectively against different traffics, as for instance, against passenger traffic and freight traffic, should be made upon a basis of the use of the property by the several classes of traffic, in point of time. I am speaking now of property used in common. I think the capital should be attributed to the several traffics in respect of time through which these traffics avail of the use of the common property.

THOMPSON.

Cross-examination.

By Mr. Butler:

On the subject of division of costs between passenger and freight, the Interstate Commerce Commission has no complete set of rules or regulations for the ascertainment of passenger cost; it has some rules which tend to a partial determination, being the classification of accounts, but they do not enter upon the problem of ascer-

1233 taining passenger cost or freight cost at all.

I was employed in this case a year ago last winter, and have had charge of the accounting features of the defense in respect to the separation between passenger and freight costs.

I gather that Henry C. Adams entertains the opinion that the cost of doing the intrastate passenger business in Michigan cannot be assigned with any reasonable degree of approximation, but I disagree with him in that. I do not entertain the view that it can be

shown with certainty, particularly upon the basis of the accounts as kept by the company. I think that, were the accounts designed in advance for the purpose of making such a showing the showing could be made with substantial accuracy. The term "arithmetical accuracy" I undertsand to designate accuracy within maximi and minimi in respect of which the variation from absolute accuracy would be immaterial.

I think that, if there were no legal complications that affected definition or constructions of the components, it could be done. I do not hold to the view that I can do what I have undertaken to do here with arithmetical accuracy. I think the general opinion among railroad accountants is that the thing cannot be done at all; mine is that it can be done with sufficient accuracy for the purpose of litigation of this character.

I do not intend to imply any adverse criticism of the manner of keeping the accounts of the plaintiff. I think they are well kept in accordance with the orders of the Commission. I had full access to all the records of the company, and obtained every-
1234 thing I asked for that they had. I never asked for the keeping of any accounts or the installation of any system for the purposes of my work, as I did not conceive it to be within the purview of my employment to ask to have particular accounts kept.

I should think that the aggregate time spent on this case would be the equivalent of the labor of one man between two and three years, including myself. My services were particularly as an accountant, but in this particular kind of work it required what may be called engineering accountancy also.

The density of traffic has a bearing upon cost per unit, and, in a general way, I have looked into some of these figures. I am of the opinion that the density of traffic on the South Shore road is light when compared with the St. Paul and the Northwestern, and Michigan railroads generally.

I have not looked into the traffic density; the question is too general to be answered. It bears upon the cost per unit and is a most important consideration. That is true both as to freight and passenger. The number of persons per passenger car and per passenger train on an average is important.

I think that in determining the cost of transporting intrastate passengers on this road in Michigan the density of traffic on some other road is utterly immaterial. The density of the freight traffic on the South Shore road might be material in determining the cost of the intrastate passenger business. It would depend upon where it
was. The general effect would be that the great density of
1235 freight business would reduce the cost of passenger business, but I am hardly prepared to testify as to universal rules.

There are some items of cost which properly should be divided between passenger and freight on the basis of relative amounts of passenger and freight business; so with the interchange item of cost, the road with the greater density of freight traffic in its cost account should assign a larger portion of this interchange item to freight than to passenger.

I ascertained the density of the freight traffic of this road, and the earnings and tons moved, and tons per mile, but I did not take

the trouble to make a comparison. It was immaterial in my work what other roads did.

I have had nothing to do with matters of earnings, but have reported solely upon matters of cost. I was not asked to determine that point, and paid no attention to it. I have made no attempt to testify to determining the earnings from any class of traffic. I have devoted myself solely to costs, and I did not require to know earnings to determine costs. The matter of earnings has been one of indifference to me. The costs are not dependent upon earnings.

I have discovered the general fact that the dining cars are operated at a loss. I cannot tell you the figures; I do not know, and cannot approximate it from memory. I testified to a distinct loss on dining cars and sleeping cars and mail and express.

I do not regard the cost of haulage of the mail or express or sleepers and diners as one of the component parts of the cost
1236 of transporting intrastate passengers. My figures are all based on that hypothesis, and I have apportioned cost to those dining and sleeping cars. I think that should be paid for; I do not think it is included in the rate of fares, so much a mile. I have included it within the general cost of passenger business, but I laid it aside in respect of the cost of transporting intrastate passengers in Michigan in respect to a given rate of fare per mile, because I considered that it has no relation thereto. I think the people who ride in the sleepers and diners should pay for it, but not as a rate per mile.

I did not undertake to say that if this company discontinued its dining and sleeping car service it would save out of the operating expenses the whole $112,603, or what part could be saved. I have no opinion on whether this company ought to do any such thing as that, as a business proposition. I do not know that, if it did do that, its other expenses would not greatly exceed the $112,603, for eating houses, delayed trains, stopping for people to eat, and running in the day instead of at night. I did not indicate the view that the company ought not to have the services of dining and sleeping cars.

I should think that the sleeping car rates probably were low. I think they are as high as similar rates in the vicinity. Nothing came to my attention to indicate that they were lower than they ought to be, or that the charges in dining cars were lower than they ought to be. If they abandoned the dining cars, I think they would have to stop the trains to feed the people. I intended to suggest that I think the custom of running expensive dining cars, and serving meals in imitation of expensive restaurants, is a wasteful practice in railroading, in general. As to sleeping cars, I think the rates are too low, generally, in the country.

1237 I think that the difference between transportation charges, as stated, and sleeping car charges as stated, leaves the sleeping car charge too low. I cannot say that the charges for the service of passenger trains, including the sleepers, diners and transportation, are too low generally in the country. My expression in respect to the rates of sleeping car fare was directed toward the general subject, not upon the South Shore road, and what I volunteered had to do with the general subject, and not with the South Shore.

I have endeavored to do what I was employed to do, namely, discover the cost to the plaintiff of transporting interstate and intrastate passengers in Michigan. I eliminate from that cost the cost of the dining and sleeping car business.

I do not think I should exclude the proper portion of the dynamo cost, to light the train. If the dynamo was used in part to drive fans and for lights in all the coaches, and in part to drive the fans in the sleeper, I think it well might be subdivided between them. I think all the expenses of the sleeping cars should be charged against the people who pay for sleeper accommodations.

Q. Let us now speak generally of railroad business: Assume that, by an increase of the service, expenses would be increased a given sum, which we will say is X, but revenue would be increased twice that sum, 2 X; can you tell us on that whether or not the increased service resulted in a profit or a loss?

A. In general, I should imply that the increased service would result in a profit. I think that the question is not as simple as it appears on its face.

1238 I find the 1912 expenses of the sleepers and diners to be $112,603. Complt.'s Ex. 48*a*, Delf, sheet 2, shows it to be $55,180.43. I make no attemp- to show whether it results in a net gain or loss. The reason for my increased cost over Delf's comes from apportioning common expenses to the sleepers and diners. If I was wrong in my assumption, that the expense of the sleepers and diners ought not to be taken into account, but in truth and fact it should be taken into account and all treated as a passenger charge, the result would be very much more favorable to the company.

By my plan of apportionment I take out of the passenger operating expenses $112,603. If I left it in, the operating expenses of the passenger business would have been increased that much. I don't know whether or not that might control the decision in the case. I have directed my attention at finding out as nearly as I could what the cost was, regardless of the result.

Whether or not there be precedents for this deduction I cannot say; I did not attempt to look them up. It seemed to me to be a matter of simplicity. I do not know of any accountant that ever did any such thing, and do not know of any court that ever held any such doctrine. As to whether any commission ever held any such doctrine, directly or impliedly, I remember that there was a very considerable argument in the conference between the Interstate Commerce Commission and the accountants representing the railroads in respect of the proper basis of casting up sleeping car and dining car expenses, and my recollection is that the results adopted had to do solely with the conformance by the railroads to the customs that the Pullman Company had set up for itself as a matter of convenience. As far as

1239 I know, that idea is a new idea in this problem; never before put forward in any litigation, rate hearing or controversy that I know of, and so far as I was guided in arriving at this decision, I arrived at it myself.

All questions that came up in connection with this work formed a subject of discussion between myself and all of my assistants, and it

would be impossible for me to say at this date who originally suggested one or the other. I cannot tell who invented the idea. It may have been me, and it may have been some of my assistants; it was not any of the lawyers in the case.

In arriving at the cost of Michigan intrastate passenger business, I necessariiy had to examine into certain of the ore costs. I did not report on it, further than as contained in my Defts.' Ex. 72. I did not attempt to separate interstate and intrastate freight in Michigan, or between Michigan and out of Michigan. I made some attempts to examine Mr. Delf's work, but the amount of it was so great that I never was able to get all through it.

I read Mr. Adams' testimony with care; I don't know that I said I did this with approximate accuracy. I said that I did this with approximate accuracy in view of existing records; that is an entirely different story.

I would not go beyond saying that, given such accounts as the company had as a basis for me to go on, I think my result is as near right as could be had; what I mean is, I did the best I could with the material at hand.

I did not set aside the expenses of the dining and sleeping cars on the theory that the intrastate passengers did not eat and sleep
1240 in them; I did it on the theory that they should pay for those services specifically, and not as a part of their transportation rate. It is not for me to say they should pay enough to cover the amount of expenses I have apportioned; that is a matter of company policy.

Upon whether they ought to pay enough to pay operating expenses and a ratable portion of the profit, I haven't any opiniou. I set aside this $112,000 because I don't think that the cost of operating sleepers and diners is a part of the service for which the passengers pay when they buy a ticket to transport them between two points. They have to pay for their food and for their sleeping besides. My idea is that it is not a proper incident to the passage.

I am trying to produce a cost account, and that is all, and I said that this was not a proper element to take into consideration in this rate case, to test these rates.

Reading, as I have for the first time today, my testimony on that subject, I think perhaps it would be suitable for me to leave out my remarks about a given statutory rate of fare, and amend my answer to say that I do not regard the cost of haulage of mail or express or sleepers and diners as any component part of the cost of transporting passengers; that has to do with the rate per mile of passenger fare paid by them. I have not attempted to express my opinion that the service of dining cars or of sleeping cars on this road should be discontinued. If they discontinued the dining car and sleeping car in this territory; I take it, as to their passenger business as whole, that they couldn't do it. I am not expressing an opinion as to what would ruin them. I think it would be bad business.

1241 The Master: If it would, then the expense of the diners and sleepers would be a necessary part of the cost of transporting passengers?

A. No, sir, I don't think so at all.

I suppose they have newsboys on their trains, I cannot remember any activity that the company has exerted in that respect, other than to let out a contract to a news company. I did not undertake to ascertain what proportion of the total expenses of the passenger department should be assigned to the space and weight occupied by the news agent. It might be done. That is not a proper expense to include, to ascertain the cost of hauling intrastate passenger; it should be charged against the revenue derived from the sale of news.

I hold that the diners, the sleepers, the newsboy, or the expense of maintaining these or rendering this service, ought to be excluded. As to the dynamo that furnished the fan, in the coach, I should think that the cost of that would probably go along with the cost of maintaining the springs underneath the coaches for the comfort of the passengers, and as to the plot of grass by the station at Marquette, I think that is largely a question of company taste. In such matters as cost of mowing and keeping the grass clean, I haven't attempted to cast up the propriety or impropriety of the acts of the management of the company, but have taken them as I found them, and have endeavored as best I might to put them in a proper position.

Ratio 4 is a time ratio; it expresses a relation of the time that the freight trains are running to the time that the passenger trains are running. I take into account that they stop to take on and let off passengers while en route, and compute time from terminal to
1242 terminal; that is, from the beginning to the end of the run. That is also true as to freight trains, with the exception that, in respect to delays of freight caused by meeting passenger trains, that time has been taken out.

I took the total time from the beginning to the end of the run on the assumption that the amount of track respectively relegated to the use of a passenger train and of a freight train over and above the amount of track actually under the train was the same. I assumed the passenger train would occupy the space between two passing tracks, except in those instances where a passenger train leaving a passing track in advance of a freight train, it would be followed by the freight train, and I computed out mathematically the effect of that relation and found it did not change the original assumption by any material amount, and the same as to freight. That is, it was from passing track to passing track, and that distance would vary on different parts of the line; I assume that it averaged. The length of the train or the weight of the train cuts no figure; the speed of the train does. A freight train making a hundred miles in 10 hours, which is the standard according to the wage schedule, would occupy the track or be entitled to twice the allowance in getting this ratio that the passenger train would that made the run in five hours, eliminating this allowance that I have made.

That factor (4) was used by me to apportion certain common expenses between the freight department and the passenger department; generally speaking, that class of expenses were those not caused by mechanical wear. Expenses due to mechanical wear I divided on an-

other basis defined as Ratio one. The time ratio was used to apportion the weather stress items between the two departments.

1243 I didn't group decay and obsolescence together. I apportion obsolescence to the two departments of service on the basis of wear. I think that in that respect my apportionment of the accounts of depreciation is subject to criticism, but such information as I had at the time when I cast up those figures led me to believe that the depreciation charge on this road reflected wear, rather than obsolescence, and I did not find it convenient to attempt to analyze into those figures and see whether it would be requisite to change the basis that I used in respect of the assignment of depreciation charges from wear to the time element, and the reason that decided me not to attempt that labor was that the difference in the result which would have been produced would have been immaterial, according to my figures. It happened by accident my time percentage and my wear percentage were the same, so it didn't make any difference whether I made a mistake in principle or not. I discovered after I had cast up my original figures that the company was making some replacements of equipment, apparently because of obsolescence rather than destruction by mechanical wear, and had it made any material difference in the result I should have recast the account in that respect.

I am of the opinion that the expenses due to obsolescence, including inadequacy, should be divided between the freight and passenger business on the time basis. It was wrong in principle not to apply the time basis to obsolescence and inadequacy. I want to point out that the accounts of depreciation do not make it clearly determinable what portion has to do with one or the other, so I didn't have the bases.

1244 The result expressed in figures is that, if the freight trains on the South Shore ran faster the passenger business would cost more directly in proportion, as the speed of the freight trains was increased, the cost of the passenger department would increase. If the power of the State would compel this company to run its freight trains slower, they could thereby reduce the passenger rates more than they otherwise could; it might seem to have that effect. It perhaps might have the opposite effect elsewhere. So far as common expenses are concerned, that have to do with time ratio rather than mechanical wear, that would be true.

For the purpose of illustrating the application of this Ratio 4, following your assumption that there was a snow storm and that $100 was expended by the company in snowplow service to clear the main line for use of revenue trains, that a passenger train followed immediately after the track was clear and made the 100 miles in 3½ hours, and a way freight following along after it made it in ten hours, 3½ of which was standing on the main line and loading and unloading freight at various stations of way freight, this method then would charge about 35/135ths, or $26, to the passenger train, and the balance to the freight train. It would charge as much to the freight while it was standing in front of the platforms as I charged to the whole passenger run—3½ hours. I think that is a correct cost accounting principle. So far as I know, or knew at the time, I originated that scheme, but I afterwards discovered that it had been in-

dependently originated by Prof. Friday. I think Friday invented it in his own mind at sometime unknown to me. When I told him about it he told me that he had thought of it. I was delighted to find such intelligent support. I don't think it has ever been employed in a case before, but I am satisfied that the principle is irrefragible.

We will say that on a hundred miles of road there are 10 crossings guarded by flagmen; if a passenger train ran the hundred miles in 3½ hours and a freight train took 10 hours, that block of ex-
1245 penses would be divided about $26 to passenger and the rest to freight. As to these items which I divided on the time basis, neither the length, weight or consist of the train makes any difference; if the speed of the freight and passenger trains was the same, a straight train mile basis would be the same as the time ratio.

I determined the proportion of the time use of each to the sum total of the two. The sum total of the two is not the sum total of time through which the tracks might carry trains. The difference between the sum total and a possible total is waste, and I apportioned the waste on the same ratio as the actual use. I don't know how much of the time was waste and how much actual use. It cannot be ascertained from the figures I have. I thought of the matter very carefully, and I concluded that, as it was my intention to apportion the wasted time upon the same basis as the utilized time, it would be wasted labor to discover the actual or definite amount of utilized time and wasted time.

Ratio 4 expresses the relation of the time used by passenger trains of 29.12%, and freight of 70.88%, to the total time used by passenger and freight trains. Freight trains, total time of occupation for the year, 4,630,398 minutes, being 70.88% of the total; total time in minutes 6,532,075. The periods of observation are the first seven days in each of the months, July, September and November, 1911, and January, March and May, 1912. I did not make the experimental determination of how much the tracks would hold.

The unit of occupation varied according to the distance of the passing tracks from each other, in individual instances; I assume that the average was the same where one train would be in a longer stretch at one time and another time would be in a shorter stretch, or vice
1246 versa. I let it stand as it was; it made no difference. I took the elapsed time, on the assumption that they were the same; it was unnecessary to use a multiplier. I never heard of the method being used except by me. It is one of my most important ratios here.

The actual number of passenger train minutes during the 42 days in question was not 1,901,677, but was as a matter of fact 234,543. That number of minutes last stated was divided by the number of train miles corresponding to the same period, to produce an average time per passenger train mile of 2.49 minutes. That average time per train mile was then multiplied into the total number of passenger train miles, giving a total of 1,901,677 miles. In respect to the freight trains, the computation was made in the same way. What I call minutes was a computed number of minutes per mile, multiplied into the total number of train miles. The number of passenger train minutes during the 43 days was 234,543.

That figure, divided by the total number of minutes in 42 days, which is 60,480, gives approximately 3.85 train minutes, per elapsed minute. It is an average of four trains over all the track; the figure is a statistical average.

I find that my sheets do not show the number of trains; they show the total number of miles of passenger trains which ran during each day on each division, and the elapsed time consumed. I did not observe trains at all; I took these figures from the dispatcher's daily report to the auditor. I made observations concerning trains moved by the date. I cannot tell you how many trains were moved on any day.

The figure, 1,901,677, is derived by the application of the total train miles of passenger trains in Michigan, D. S. S. & A. operations, which was 723,874 train miles, to the average time of 2.49
1247 minutes per train mile, to produce the result of 1,805,342 minutes of track occupancy, to which last mentioned figures there was added a similar figure in respect of C. & N. W. and C. M. & St. P. operations on South Shore tracks and obtained in a like manner, producing a total for the last mentioned subdivision of 96,335 minutes, which, added to the previous total, gives 1,901,677 minutes of passenger train occupation on the track. That covers a period of one year, through which 723,874 train miles of D. S. S. & A. trains were made, and 31,325 train miles of St. Paul.

I have arrived at the conclusion that the passenger train occupancy of the track in minutes was 1,901,677; if we divide that by the number of minutes in 365 days, that will give us the number of trains on an average for the year, which is slightly less than 4. This Company had only four passenger trains occupying its track in Michigan on the average each day of 24 hours in 1912. If the trains were only on the tracks half a day, there might be eight trains running 12 hours, making four trains 24 hours. Approximately 8.85 freight trains on the average per day. That is on the assumption that these 42 days represent a fair typical average of all of the time. It would be right to call the space between passing tracks the unit of occupancy. The units of occupation, or the distances between the passing tracks, vary in length. My recollection is that the average distance is, between passing tracks, about six or seven miles.

I assumed that each train, freight and passenger, occupied the same space on an average. Sometimes it may be said that trains occupy more than one stretch. On this road, the traffic is not sufficiently dense so that this suppositious case would be of great weight. Compared with such roads as the Michigan Central, density
1248 of train movement is light. Compared with some divisions of the Pere Marquette, I should say it is not. I do not like to make a general comparison. The train movement on the South Shore is light compared with some divisions of the St. Paul, and it is not light as compared with others.

I think it is obvious that there is lots of room for more trains on the South Shore road in Michigan, but could not give you any opinion about how many the road could accom-odate. I have no

doubt that it could accom-odate twice as many, but to take that proposition and continue it and say it could in turn accom-odate 3 times, 4 times, 5 times or 10 times, as many, is a proposition I am not going to attempt to answer without studying that problem itself.

I did not know how much waste time there was and did not even form an opinion as to whether there was two or ten times as much waste time. I have divided my waste time on the basis of the used time. I think there is but one sound view on that subject, which is universally held by cost accountants, namely, that, in respect of discovering costs in the past, it must be done, and I have done it. So far as I am aware, the subject of waste time has not been generally carefully examined into by those who have made computations of this sort. So far as I know, the problem has not come up until I, myself, brought it up. I never conferred with any accountant on the subject outside of my own force, except Mr. Friday. Mr. Friday, who worked on this case under Dr. Adams, when I stated to him my own views in respect of time use or occupancy of the tracks, stated that he, himself, had independently come to the same view before I spoke to him about it, and that it had been suggested to him by reading your (Mr. Butler's) brief in the case, page 41, in respect
of the exclusive use of the tracks by the one service or the
1249 other. He entertains the same view about dividing the waste
time that I have applied here. This time ratio was never used before, so far as I know, except that there is something in the Minnesota Rate Cases, in the decision of the Supreme Court, that might indicate that the Court had something of that sort in mind.

For each $100 of fencing that is spent, I charge the freight $70.88; that is true for expenditures for watching crossings, bridges, work about the embankments, cuts, ditches, drains and maintenance of crossings and crossing signs, and it becomes an element in the factors used for the division of superintendence, etc., so it has much to do with my result. It would not require a great deal of research to ascertain just to what extent the use of this factor affected my result. This ratio of 29.12 to 70.88 represents the elapsed time, rather than speed, between termini, of the passenger train to the freight train. It follows that, if passenger trains would go slower, their operating cost would be more. If you abandon the dining cars and stop the trains to let the passengers eat, it would not increase expenses for keeping up the fences. If the passenger trains occupied more time and went slower, stopping for the people to eat at the stations, it would thereby cost the passenger business more for keeping up fences, cleaning out ditches, putting in bridges, watchmen at crossings, superintendence, stationery, and all the other things into which this time enters as an element or a factor for division; that ratio, arrived at by comparing the time or speed of the different classes of trains, does not take into account the weight or the length of the train, except as those affect time in transit. According to this scheme, out of $100 for fences, $29.12 charged to the passenger business.

1250 I charge some of that to mail and express, according to Ratio 3, passenger train car miles in Michigan, and the sundry sugdivision- thereof. So of that, $29.12, I would set aside to mail and express about 14½% and 26.36% to sleepers and diners. Ratio 3 was intended to be the nearest approximation to a time ratio that could be had. I insisted that the apportionment between those three classes must be made on the basis of time. The mail and express car and sleepers and diners make precisely the same time over the road enroute as the rest of the passenger equipment. The ratio between different parts of the car is the ratio of the linear space of the two ends of the car, or two needs of the car, one to the other; that is a time ratio in respect of the problem under examination. It is a car mile and a space ratio, and becomes for this portion of the problem a time ratio. The car mile basis, when it comes to the division between passengers and baggage and mail and express is called by me time, and the car mile basis is the right basis for that division.

In the classification of accounts by the Interstate Commerce Commission hitherto, dining cars and sleepers have been classed as outside operations, and the South Shore has followed that classification. Assuming sheet 2 of Complt.'s Ex. 48*a*, Delf, to be correct under the classification during that year, operating expenses were $55,180.43. It was only the net that was taken into account, $1,413.48. That is, the operating expenses of the company, when stated, would not include these operations. In my work here, I have ascertained the cost of sleepers and diners at $112,603; that should be added to the $55,180.43. My figure has to do with the transportation and maintenance expenses, etc., of sleepers and diners not included in

1251 outside operations. I do not claim that if the Company did discontinue the service they could save the $167,000 in operating expenses. Undoubtedly there would be some considerable saving, as to fuel and such things, but whether the total saving would equal the revenue shown on Delf's Exhibit, $56,593, I cannot say. I would not expect it would amount to that much. I think that, leaving things as they are, all other things being equal the company is as well off by continuing the dining car and sleeping car service as it would be if it discontinued the service. I think it would be very foolish and absurd business policy for it to discontinue the dining or sleeping car service. Undoubtedly, the competition, even in some parts of the northern peninsula, is very active. The principal points served by this road in Michigan are the points in the Copper and Iron countries, and they are highly competitive to the C. & N. W. and C. M. & St. P. but they are mostly monopolistic to the South Shore. The South Shore monopolizes the business at its own end—the business that moves from Detroit, for example. The Northwestern is a pretty strong competitor to the South Shore, or the St. Paul and Michigan Central. The whole territory up there is in competitive territory, both freight and passenger In respect of general competitive conditions, it is true that there is competition although the territory of the South Shore itself is in good part non-competitive.

Marquette is hardly competitive, except for steamboat traffic in summer, so far as passenger business is concerned. I should expect that freight rates are controlled by competition, and measurably, passenger rates. I think that if the company would suspend its dining and sleeping cars it would be a losing proposition.

1252 Mr. Butler reads "Classification of operating revenues and operating expenses of steam roads prescribed by the Commission. Issue of 1914, effective July 1, 1914." The introductory letter contains this paragraph: "Accounts are provided in this classification for the revenues and expenses of operations which heretofore have been classed as auxiliary or outside operations. The purpose in merging these accounts has been to secure a statement of revenues and expenses in connection with the operation of all physical property, the cost of which is includable in the accounts for investments in road and equipment."

It is becoming quite customary in this country for railway carriers to furnish dining and sleeping car service, and it has become a usual incident of transporting persons that way. It is a necessary incident of the service, in view of the state of civilization and the public demand.

I think the sleeping car fares are too low, generally speaking. The railroad companies should have the money, instead of the Pullman Company. What I mean, of course, is that, if the rates were raised to $5, I did not think the increase should go to Pullman; it should come back to the railroads, for their cost of hauling the cars. I think, generally speaking, that rates of sleeping cars should be raised in this country. I have not any opinion as to the general propriety of raising or lowering passenger fares. It is only sleepers and diners that I want to express an opinion on. I agree that sleeping and dining car service is a necessary incident of the transportation of persons for hire by rail, and I express the opinion that the charges were too low. I do not think that I am competent to answer as to whether a two cent passenger rate is too high or

1253 too low on the South Shore road.

I haven't examined into its mail and express rates. I paid no attention to revenues whatsoever. I did not separate the cost between the sleeping and the dining cars, so as to show the cost of each. I don't think that they are a necessary portion of that service which is to be given to the passenger for the fare he pays for transportation between two points. Nobody else does either. I excluded it because I think that is something that should be paid for separately and its cost should be charged against the separate payment, but I do not undertake to say, as a practical matter, that this company could make charges which would give it $167,000 and more. That is its misfortune.

A person engaged in any large business, like a factory or a railroad, is justified in taking on an incidental business whenever the returns exceed the increased cost. That is probably a rule that is generally good. I would say that the principal business of the South Shore road was the transportation of freight and persons for

hire, and that the transportation of mail and express was in a sense incidental to it.

Q. And would you also say from your knowledge of such matters that the increased cost of hauling the express and mail matter is very slight?

A. I hardly like to subscribe to that. People take on new units of business on the theory that it doesn't cost much more to handle, but when they get through they find it has borne its share of expenses. I do think that the mail and express business increased the cost of operation of the passenger trains of the South Shore; I don't know how much; I haven't endeavored to find those things out. I have made no attempt to determine the increased
1254 cost due or chargeable to the mail and express business over what the cost would be without them.

So far as the records furnished the information, I can state approximately what it does cost to haul mail and express and what proportion of the total cost is justly assignable thereto. Assuming that the records are true, insofar as they purport to be true, my results are true, so far as the records are responsive to furnishing information required to be had. They are not directly responsive to the cost of hauling the mails at all, only upon sundry computations.

I assume, and have no reason to doubt, that the things that are marked down in Mr. Delf's records are true, but the situation is not analyzed, or the scheme of accounting is not made as I would make it, to ascertain the cost of mail or express. I don't know what I would do to have the books kept in such manner as to show the cost, but, so far as the books are responsive to digging out the truth I think I have got it approximately correct; so far as they do not afford the basis for a correct computation, to that extent my computation is in error.

I say that they may or may not be true. I further say that they are as near the truth, approximately, as can be learned from the existing records, and the existing records are the only evidence of what has happened. I also say that the existing records were not kept so as to enable anyone to ascertain the truth with precise accuracy with respect to the subject. I now say that in some regards I think my conclusions are approximately correct, and that in other items I couldn't say. I did not mean in respect of any one account; I meant this or that stage of process. The mail and express
1255 is all carried in baggage cars. They would have to provide space at any rate for the baggage.

I suppose, in a sense, this mail business is kind of incidental to the main business, but, since you began talking about incidental businesses, I find it rather difficult to give my assent to the notion that the railroad is run for any one particular business; I think it is run as a composite for all of the businesses—freight, passenger, express and mail.

I think there is no ratio I have used that is established with mathematical accuracy. In my scheme of apportionment, especially of maintenance of way expenses, mechanical wear expense is divided

on methods different from the expenses due to other causes. It is impossible to tell with accuracy what is due to mechanical wear, and what is due to ballast or decay. I classified according to where the majority of the dollars fell; if the majority in a single item fell to wear, I classified one way, and, if to the weather side, another way. There is a great diversity of opinion as to what proportion is weather stress and what proportion is wear; Ratio 2 is founded on the proposition that it costs three times as much to maintain one track as another. Ratio 2 is important, because it has the effect of taking out 13.32 per cent of maintenance and it is quite important to know whether that is arrived at correctly. I took the basis from an exhibit of Mr. Riggs.

The increased cost to the company of hauling its employes free on its passenger trains over what that cost would be if they didn't haul them, I don't think is a figure susceptible of determination at present. Cost accounting might reach it, but I don't think
1256 the figures exist here to show it. That comes under the class of things which you start in by saying "it doesn't cost any more;" finally when the facilities become more or less filled up, it requires more facilities and does cost more.

I think that on the average the cars were less than half filled, including the help that is hauled free. I haven't investigated whether it increases expenses any substantial sum to haul its employes in its regular passenger trains free. It is not trifling with common sense to say that there is a substantial element of expense in permitting the employes to move from place to place upon the trains, any more than the similar trifling with common sense, to offset which, that element of cost was brought out *be* me. I am rather disposed to think that there has been a great deal of attempt to make hairs into tons. I don't think it is a humbug to claim that it costs anything to haul coal, ties, timber and supplies that are hauled on revenue freight trains, to operate and maintain the road.

Q. Did you give the reasons specified and lettered *a*, *b*, *c*, etc., as reasons why the total train mile cost of the revenue freight train was greater than the total train mile cost of the revenue passenger train, as the language purports, or did you mean that the proportion of common expenses of the freight was greater than of the passenger, for the reasons enumerated?

A. I meant the proportion of common expenses, of course.

Q. I observe again this question: "Mr. Thompson, taking all of these things which you have said weigh in the cost of producing the revenue freight train mile and taking into account also the things which are said to increase the cost of producing the passenger
1257 train mile and which you have analyzed, which in your judgment is the more expensive revenue train mile to produce?

A. It is my opinion that the freight revenue train mile is more expensive to produce on this road than the passenger train revenue mile.

Q. Have you any judgment as to how much more?

A. I think it is considerably more than twice as expensive to produce the freight train revenue mile than the passenger train revenue mile."

A. At that point I mean in respect to the division of common expenses. I was answering questions that counsel asked me, and did not then, as I sometimes do not with you, see all of the things that might bear upon it when it has been running along on a particular line.

Q. Now, if that is true, what relevancy to the subject does the reason (*n*) have? The reason is "The exclusive use by the freight traffic of a large amount of mileage of line sidetracks and spurs not used in the passenger traffic."

A. The relevancy of that is that the question, as I understood it, was directed, not to my own computation, but to Mr. Delf's computation, in which he had treated as subject to a division as common expenses some things which I myself had laid aside and excluded.

Mr. Wykes: Those all appear in the common expenses.

Q. Reason *l*, "the sustaining through passenger expenses of services not remunerative in the sleeping and dining car service?"

A. That also was directed, as I say these questions had to do with the division on the train mile basis that had been made by Mr. Delf, in which he included as common these expenses you just mentioned.

1258 Mr. Butler: I offer in evidence the Classification of Operating Revenues and Operating Expenses of Steam Roads, prescribed by the I. C. C., effective on July 1, 1914. Marked "Complt.'s Ex. 94, Thompson."

I do not recognize that a revenue train mileage basis might be a proper basis for the division of the common maintenance expenses on other roads and in other cases. I can conceive of a case in which it would chance to bring out the same result, but that would be a mere coincidence. I think it is no measure of the fact, and is not supported by reason. I think it would produce a highly inaccurate result. I do not intend that all of these alphabetical reasons have general application to all of the items.

Q. These reasons are not alleged as reasons why you did not use train mileage on the basis you analyze this proposition, but are alleged as reasons why it was wrong to use train mileage as the company used it, is that right?

A. I think both. They are advanced as reasons why it was improper for the company to use the train mileage basis, and why it would be improper for me to do likewise.

Q. You think it would be better, do you not, to separate the terminals from the line and divide the terminals on the best basis you could and the line on the best basis that you could?

A. I think so, yes.

Q. And that the adding of switch engine mileage to the train miles, well, it is scarcely logical anyway is it?

1259 A. Well, I think in respect of that last point that it would tend to reduce the error which would be involved in using the line train mileage only—this switching mileage for the freight exceeds the switching mileage for the passenger almost uniformly.

Q. So then it follows, I take it, that you are of the opinion that the train mileage basis assigns too much of the maintenance expenses to passenger, and that if you would add the switching mileage it would reduce the error; that is the idea that I gather?

A. I think it is extremely rough in either case, but I think in the present case the addition of switching miles would tend to reduce the error.

The expenses of the car accountant's office would follow the number of cars rather than the road train mileage, and likewise the cost of inspection of cars at interchange points. Furthermore, although there are but 67 passenger cars whereas there are 3,003 freight cars on this road, the expenses of the car accountant not only would not apply upon the ratio of the revenue train mileage, but they are also greater per car for the freight cars than for the passenger cars, as the freight cars travel all over the United States and have to be kept track of everywhere, and this is not the case in respect of passenger cars.

I found car accountant's expenses included within general expenses, and I subdivided general expenses upon the basis of an average of all of the previous determinations. It might not be exactly right, but the margin of error would be reduced. If I was wrong in all my previous determinations, the extent of error therein and thereby would be increased.

1260 When you speak of accuracy I am not quite sure, and you have apparently used the term in different ways, and I want to be sure that I get myself properly understood by this Court. When you say accuracy, if you mean absolute correctness, in terms of five dollars or one dollar or one cent, then I answer that I do not attempt such accuracy, but if you mean accuracy in respect of substantial accuracy, and a minimum degree of variation from error, then I say that my results are substantially accurate. Percentages of variation that my be included within accuracy would vary in different items. My limit is the nearest determination of the fact that can be made from the existing records. That is the best possible then. Substantial accuracy means the best possible.

So far as the engine alone is concerned, I think the wear on the ties increases materially at speeds exceeding 40 miles an hour; I think at speeds below 30 miles an hour the difference in speed is not material in respect of the wear. It would be a greater injury to ties and rails at a speed of 30 miles than standing still, at 30 than 20, or at 30 and 16, or 27 and 16. I want you to let me get through with that; I consider that the difference between the injuries at zero speed and at some low speed immediately above is not great. There is wear due to movement, and speed affects the wear; wear of some sort is greater when the speed is greater than when the speed is less. I think that the total wear is greater at high speeds than at low speeds; I think it greater at 40 than at 16 miles per hour. I think, all other things being equal, wear at 27 miles would be somewhat greater than at 16; perhaps 15%.

The passage of a train over a track produces impact, because of the necessary imperfections in the track and in the equipment.

That impact is not measured by the square of the speed multiplied by the weight. A moving train has momentum, and the
1261 extent of that momentum is weight by speed; a moving train imposes impact, and that impact is measured by weight by the square of the speed, but it is not the whole weight of the train which is multiplied by the square of the speed, but the equivalent in weight of the blow caused by the imperfection mentioned. The impact of an engine would not increase as the square of its speed. Its momentum would increase as its speed, directly. If you drove that engine against a bumper at the end of the track and tried to measure the impact, it would increase as the square of the speed; but we were not discussing that impact.

The amount of impact upon the rail depends on many conditions. A train entering a curve will produce an impact upon the side of the rail if the outer rail is not elevated. Assuming a six degree curve and the passage of an engine around that curve at 10 miles an hour with a flat track and rails level, there will be impact; with the rails elevated to the proper degree of elevation for that speed, no impact different from that on straight track. The passage of this locomotive over a straight track would produce impact, and would produce impact on a curve. The impact on the straight track, and also on the curve, would vary—be greater as the speed increased on the straight track.

Square of the speed would be a very small element in the determination of the amount of the impact in both cases, because the impact is caused in the main by certain other causes which have not been mentioned, the speed of whose movements *are* not directly related to the speed of the train. Impact increases with the speed of the blow and where imperfections exist in the track and in the engine with the speed of the passage of the engine over a track whether it is straight or curved. Imperfections always exist
1262 in both to some degree. It is uniformly true that impact results by the passage of the train and increases as it passes either over a straight track or a curved track.

I think that there is necessarily some slippage one way or the other, of one wheel or the other, going around curves. I have observed it to take place, and I have heard it. I may be mistaken in respect of the coning or non-coning of wheels being the practice; in respect of the slippage, I say that it necessarily follows that there must be, through considerable part of the time, a slippage. Coning cannot be made perfect so as to prevent slippage. If there is coning, it would tend to reduce the amount of slippage, of course, and, under conditions that were real, at least, it would prevent it; that would be the purpose of the coning.

The total amount of the accounts which were apportioned between passenger and freight on the basis of wear was $238,904., resulting in attributing to passenger 28.88% or $69,019. If these accounts had been divided on a time instead of a wear basis, it would have increased the charge to intrastate passenger service by $907.84, if the small account of exclusive passenger tracks be neglected. The total of the accounts apportioned by me to passenger and freight

on time was $93,554, the passenger proportion being 29.12 per cent, or $31,183. Had these accounts been divided on the wear basis, the charge to intrastate passenger would have decreased $355.51, the net result of the two being that the cost of intrastate passenger business would have increased $552.33.

The figures just read show the effect of the time basis or wear basis on accounts which were specifically divided on those bases, but not of the amount of superintendence, etc.

1263 I want to say that I have looked further into a subject and discover that I was mislead in accepting a statement of Mr. Russell, to the effect that the wheels were not coned, and that my previous belief in that regard, derived from many sources to the effect that the wheels were coned, was correct. I was right, in the idea that the wheels were coned, up to two or three weeks ago, when I accepted the statement of a man I thought knew what he was speaking of, that they were not, and, in accepting that statement and speaking because thereof, I made a mistake. My work requires me to go over a great many fields; when I get into a subject where I am directly told by a man whom I believe ought to know such and such a thing, which is contrary to my previous belief, if I am greatly pressed for time, as I was on that occasion, I may be mislead then. If the weight were sufficiently greater on the wheel on the inner rail, the slippage would take place on the outer rail; it would slip backwards. The wheels, when new, are coned; they wear, and the cone shape no longer exists, and they become cylindrical. The general effect is that freight car wheels that have been considerably worn have the conical shape largely worn from them.

In the Lackawanna Case I apportioned maintena-ce of way expenses on revenue train mileage. There in Roadway and Track, Balast, Roadway Tools and Supplies, Work Equipment—Repairs, Renewals and Depreciation, and Removal of Snow, Sand and Ice, the common items on the line tracks used by the freight and passenger trains was divided by me on the train mileage basis.

"Signals and Interlocking Plants.—Block and other signals apportioned entirely to Line; assigned to Freight, Line, on basis of

1264 Freight train mileage. * * * Interlockers, terminals, so apportioned, assigned Terminal, Freight, on basis of freight switch engine mileage; interlockers, line, so apportioned, against line, freight on basis of freight train mileage."

"Over and Under-Grade Crossings—Apportioned between Terminal and Line by Bridge Department; Terminal assigned Terminal, Freight, on basis of freight switch engine mileage; Line assigned Line, Freight, on basis of freight train mileage."

"Tunnels.—All Line; assigned Line, freight, on basis of freight train mileage."

"Bridges, Trestles and Culverts.—All Line; assigned Line, Freight, on the basis of freight train mileage."

"Maintaining Joint Tracks, Yards and Terminals—Taken as all Line; assigned Line, Freight, on basis of freight train mileage."

It was my purpose, in preparing Defts.' Ex. 72, Thompson, to adopt the allocations as between states made by Mr. Delf in his work.

I did not adopt the allocation made by him in account 62, "Dispatching Trains."

In the Lackawanna Case, "Dispatching Trains" apportionment between Terminal and Line on the basis of 25% and 75% (estimated 25% of the whole amount being applicable to instructions as to terminal placing of cars, etc., etc.). The amount so apportioned to Terminal assigned to Terminal, Freight, on the basis of Freight switch engine mileage, on the basis of freight train mileage.

Station Employees: In the Lackawanna case, I had an estimate prepared in respect of each station, for a given month, as to the
1265 amount of time relatively attributable against passenger against freight, and applied those results to the year. The apportionment was made by the direct examination of the payroll for each station for a month, and the determination, as to whether each employee exclusively on passenger or on freight business, and if his work was common to both services an estimate was obtained of the relative portion of his time put in on each service. I considered each man's wages separately, and ascertained the amount of time he spent in passenger and the amount he spent in freight, and divided his wages.

I went over this property between St. Ignace and Marquette, and have been over portions of it before. I inspected it with a view to determining whether it was well kept up. In my direct testimony, I expressed an opinion as to the standard of maintenance; in this particular case I was guided by the reports given by my assistants, who inspected all of the line, and I formed an opinion of the condition of that which I went over. That is to say, I rode on the hind end of the passenger trains, watching the track. I should think the train ran from 25 to 35 miles an hour, perhaps 45 some places. I made several trips over this part, I saw it all in daylight.

I said, on direct examination, that the maximum elevation of the outer rail on this line was eight inches. I do not know what degree of curvature you would find eight inches on this road; the point intersecting me at that moment was covering the maximum.

From my own observation, I claim to have enough knowledge to pass upon the standard of maintenance of this road betwen St. Ignace and Marquette. It is a good road, well maintained, up to the standard of single track roads in this part of the country of like
1266 class. So far as I have seen it, its main line is in first-class condition; I think it is suitable for the kind of traffic it has, and good for 40, 50 or 60 miles an hour, so far as track is concerned, and so far as I observed the equipment. I never meant any criticism upon the standard of maintenance of your main line common tracks.

In respect of three miles to one mile, I have assumed that the cost of maintaining side tracks was one-third of the cost of maintaining main tracks. The 13.32% is affected by the 3 to 1 I have spoken of in respect of side tracks.

So far as I have seen the road, I have testified from my own observations and knowledge, beyond that from the reports of my assistants. I testified that, if there were no passenger business at all, this road would have to be maintained to its present high standard. The spur

tracks to mines and son on are sufficiently maintained for the freight traffic. I did not say that on an average the maintenance of the main line costs 3 times as much. That has to do with side tracks.

These traffic spurs were included with the side tracks, and not as main tracks. My memory is incorrect; I had forgotten the fact. I say that I think that heavy traffic spurs to mines should be included as main track, and to that extent then my 13.32% exclusive — freight is an error. Other things remaining unchanged in the application of my method, evidenced by Defts.' Ex. 72, the greater the percentage of freight exclusive in Ratio 2, the less there would — in common, the less in passenger, and in intra passenger. If there be an error as to that, it is aganist you; the amount would be, however, small.

1267 In the Lackawanna case, I divided a portion of the train supplies and expenses between freight and passenger on the basis of train miles.

"Injury to Persons was apportioned between Passenger and Freight on the basis of train mileage; amount apportioned Freight assigned 50 per cent to Terminal, Freight, and 50 per cent to Line, Freight."

'Crossing Flagmen and Gatemen,—Apportioned entirely to Line; assigned Line, Freight, on basis of freight train mileage."

Drawbridge Operations: "All Line; assigned Line, Freight, on the basis of freight train mileage";

Damage to Property, Damage to Stock on Right of Way, Operation of Joint Tracks, Net, in the same manner.

The Master: Do you answer from memory or belief that the brief is right?

A. I am answering from the fact that it appears in this brief in respect of a number of these items that I cannot remember.

General Expenses. "The total of amounts assigned Terminal, Freight, and Line, Freight, in all of the foregoing accounts are respectively divided by the grand total of all items as reported for all such preceding accounts, and the resultant percentages are respectively applied to the total amount of General Expenses and the resultant amounts respectively assigned Terminal, Freight, and Line, Freight."

Fixed Charges. "Total of Fixed Charges in the Nature of Taxes, interest and Rentals. To this total are similarly applied those percentages last above described (and those last above described are under General Expenses) under operating expenses, General Expenses, and the resultant amounts similarly assigned to Terminal, Freight, and Line, Freight."

1268 In that case, the respective train mileage, freight and passenger, became factors, or elements in the factors, which were used to divide, not only general expenses, but also the fixed charges, in the nature of taxes, interest and rentals.

In the division, in this case, of account 2, Ballast, the amount used was the average of five years ending 1912, and being, Michigan $3,989.50. The average for the six years ending June 30th, 1913, would be about $7,500.

Q. It would be quite as reasonable to average for the last six, wouldn't it?

A. Not if you put on $25,000 worth of Ballast in 1913. The inference would be that you were perhaps putting some capital improvements on your road at the cost of maintenance, I should think. Ballast can be made a capital improvement. The addition of a considerable quantity of ballast over and above that which is on the road is, in my opinion, the nature of a capital charge. My understanding is that under some cases the road can treat ballast as a capital charge. I was answering, not upon the strength of what may or may not appear in the Interstate Commerce Commission's classification, but on what I believe the proper practice. I believe the proper practice in addition of new, but not in renewal of, ballast may be to add it to capital.

There is no reason why six years' average instead of five might not be taken here for ballast. I should think that the figure indicated some change of policy on the part of the road.

Q. You think it is too big, so you took the five?

Mr. Wykes: I wish to object to that inference contained in the question, because, when Mr. Thompson's allocations were made, the 1913 figure was not available, and, in the figures that Mr. Parker has put into the record for 1913, six years were used, and the larger figures that you are talking about were used for that year, and the first time they became available.

1269

A. If I had been aware of the amount and had known that it was the mere renewal of ballast, I should have taken six-year items. I don't think any other course would have been allowable.

In the divisions by my gross ton miles, Ratio 1, I have disregarded speed entirely. I believe the speed of the passenger trains in this case causes more mechanical wear than the freight trains, but that the amount is a small percentage, and probably not over 15 per cent due to speed alone, and that that figure is offset by other figures or other inferences upon the other side. Therefore, the additional element of damage due to speed alone would be counteracted and offset. Speed is an element affecting wear. The speed of the passenger trains wears the track, and the things that wear, on the average 15 per cent more than would the same trains if they moved at the freight speed. I fixed it as the opinion of eminent engineers that, the rate of speed becoming very high, the damage to the track becomes less. On the same principle as a man skating over thin ice, the static load is, in effect, decreased. "Static load" means the weight supported by the track when the train is standing still.

I said that the dynamic augment did not pass the limit of the elastic resistance of the track structure until speeds of 30 or 40 miles were reached. "Dynamic augment" is the increase in the weight upon the track due to elements that come into being when the train is moving. They are due in large part primarily to the imperfect counterbalancing of the main and side rods of the engine, rather than to the

movement per se, but they take place when the train is mov-
1270 ing; as compared with static, it means it is moving?

The conception of the elastic limit may be very simply stated, as follows: If a body be stretched or bent or otherwise deformed to an extent that is within its elastic limits, it will spring back to its original form. If, however, the deformation passes the elastic limit, it will not completely return. (Counsel reads previous questions and answers of witness.)

Q. Having called your attention to that testimony, I want to say that it did not give me the impression, and I don't recall any testimony in your direct examination which did give me the impression, that you are of opinion that the average speed of the passenger trains increases the wear of the parts that do wear 15 per cent over and above what such wear would be by such trains if those trains moved only at an average rate of 16 miles an hour, and I understand that as just stated is your opinion?

A. Yes, it is. Static load is the weight of the engine—let us confine ourselves to an engine standing standing on the track, that load is augmented by movement, and increases, other things remaining the same, when the speed increases, but not directly with the speed. Other things being equal, the speed is a very important factor in determining wear. It is so important that, other things being equal, a speed of 27 miles per hour would damage the track 15 per cent more, in my opinion, than a speed of 16 miles an hour. That 15 per cent represents the result of a series of experiments conducted on a railroad by T. M. R. Talcott, an engineer and operating railroad man whose headquarters are at Richmond, Virginia. His experiments were re-
ported in a book written by him on the subject. I don't re-
1271 call the title at the instant. So far as I know, that is the only comparative record on the subject. I thought it bore the indicia of being truthful and correct. I do not now recall of having stated this truth in my direct examination; I only answered the questions that were asked me, and answered them as fully as occurred to my mind at the moment. It was not my intention to give the impression that speed ought not to be taken into account as one of the elements of the whole problem.

I was of the opinion that the amount of power availed of to move the trains would measure, in a reasonable sense, the wear upon the tracks, and I am firmly of opinion that the difference in speed from 16 to 27 miles an hour would increase the injury, taken as a whole, resulting from the use and passage of the train, at least 15 per cent.

Well, I have to say that there apparently do not exist a great number of experimental determinations of this sort, and I availed of those which I could, together with such experience as I have, and my reasoning power to such extent as I have that. I should expect that the relation would be greater in case the speeds were increased to 20 and 40, and that the damage at the 40 would be somewhat more than 15 per cent in excess of that at 20. I am not able to say, offhand, how much greater. I think that the injury at 50 would be markedly greater than at 20; it would be more than the 15 per cent.

I divided ties all on the weight basis, because a majority of the

dollars were expended because of wear, and not decay. If the proportion due to wear and that due to decay could be ascertained, it would be more exact and scientific to divide each proportion by its appropriate factor.

The cost of repairing damage that is caused by any particular traffic should be charged against that traffic, and those costs not
1272 caused by any particular traffic, but which run with the lapse of time, should, in my opinion, be charged against the several traffics ratably with the proportions of time through which they use the property. I do not think there is any other basis at all, except the time basis, appropriate for dividing the weather stress items.

Repairing a washout is weather stress, and ought to be divided on a time basis. Washouts occur at unknown and variable intervals through a series of years; the cost of repairing them has to be borne by the property as a whole, and I think it should be charged against the several classes of traffic in the porportion in which they avail of the property. If the fence is out of repair, and a bull gets through the fence and derails a train and breaks down a bridge, I think the bridge ought to be restored on the basis of time, because, to carry your suggestion to its logical absurdity, in the course of so many years so many bulls would break through so many fences.

I don't think the speed of trains has anything to do with it. I have in my answers endeavored to point out that whereas you use the speed of trains in connection with my time ratio, I refer solely to the elapsed time during which the trains avail of the facilities. The speed of the passenger is 27 miles, and freight 16; that makes 43, added together; 43 into 16 will give about 36%. I should think that the excess of about 7 per cent is due to the additional time that the freight train is at the station over the time the passenger is at the station.

I recognize, of course, the distortion of my views into your hypothetical case; I recognize also what you say logically follows, but I don't think that destroys the value of the views.

1273 Q. Now, I am trying to ask you what relation to that subject the excessive time of the freight train at the stations between terminii has to it?

A. You carry in your question a very nice little inference, which is that the freight trains are standing in front of these stations, whereas, in considerable part, they are switching on the main track, the sidetrack, etc., and are availing of properties in respect of bridges, probably the fact is that there isn't very much switching done over bridges; to that extent your argument is reasonable.

Q. It appears from one of the Delf exhibits that 32.2% of the time of the freight trains with certain exceptions, is spent at stations, and that much of that time so spent at stations is spent on tracks that have been assigned by the defense here, and by you, to exclusive freight uses; now I want to ask you what relation has the time spent on sidetracks assigned to freight, by freight trains, to the problem of dividing the cost of renewing a bridge, or the ballast between stations, or the fences between stations?

A. It has none, whatsoever.

Q. Or maintaining ditches, or embankments, or slopes?

A. It has none, and were the figures capable of sufficient refinement to extract these elements of error, I should say that they should be so extracted.

I stated that the average speed of the passenger trains while moving was 27 miles per hour and freight trains 16 miles per hour while moving. What I did was: I made examination of the dispatcher's reports for March 30, April 15 and 30, May 15 and 30, and
1274 June 15 and 30, 1912; the examination covered 42.5 miles out of 198 on the Mackinaw Division, between Marquette and Wetmore, 45.9 miles out of 94 on the Houghton Division, between Marquette and Nestoria, and 35 miles out of 99.6 on the Western Division, between Covington and Bruce's Crossing. It is possible that, if a complete examination was made, those figures might be varied one way or the other, but I don't think the variation would amount to much.

I think the damage to track caused by a train running 60 miles an hour is considerobly more than that caused by a train running at 10 miles an hour. I cannot attempt to state how much more, offhand; an opinion of that sort, given offhand, would be of no value. "Critical speed" is a term used by engineers. The use of the term "critical" by engineers is that which indicates the change from one set of results to another set, occurring distinctly at a given point as in the matter of speed, a given rate of speed or a given degree of temperature in some other problem; 27 miles an hour might be a critical rate of speed on some structures. I think that would depend entirely upon the nature of the structure. The critical speed varies with conditions.

Railroad managers recognize that speed is an important factor as to strain on bridges and the requirements of strength and the like, by limiting speed on bridges that are weak. I think it clear that the movement of a train at as low a rate of speed as 27 miles an hour, or even 10 miles an hour, over a bridge imposes more stress upon the bridge than with the same load standing still. I think that the difference of 10 miles an hour is very slightly perceptible, and 20 miles is considerably perceptible. It goes up pretty fast when you get 20 miles an hour, and along 30, 35 and 40 it goes up fast. I don't think it is true that freight trains never reach 35 or 40 miles on this road. I think they frequently run as
1275 fast as the passenger trains. I think they frequently run 40 or 50 miles. I think you would need just as good bridges and structures for the freight trains at their speeds as for the passengers at their speeds.

The size or weight of the train did not make any difference in the time element, except if the trains were of great length it would probably increase the time required to get over the road. Within the limits of 30 cars compared to an engine and a caboose, it wouldn't make any difference.

Q. The Geological Survey department of the Government of the United States is accustomed to use the railroads of the country, with their consent, to get over, and to use these little velocipedes, sometimes called "speeders"; They don't go very fast at times. Under this time theory, assuming the Government was to pay its share of the weather stress items, there would be chargeable to this speeder,

going over the road at 4 miles an hour, as much as there would be to ten passenger trains at 40 miles an hour, on the average?

A. Yes, I recognize the conclusion that follows from your assumption, but I think as a matter of fact the speeder would have to get off of the track and out of the way.

Q. Assuming there was no train coming, as is the case nine tenths of the time on all parts of the South Shore road, the track is idle, and a speeder goes by on an average of four miles an hour, for a hundred miles, under your theory it would be justly chargeable with as great a proportion of the weather stress items as ten passenger trains over the same hundred miles at 40 miles an hour, would it not?

A. I see that that apparently follows from your assumptions.

1276 Whether or not a careful examination into the components of the hypothesis would make me say yes after I had so examined, I don't know; it is one of those things that appear to be perfectly simple on the surface but may not be when analyzed.

Q. You think, do you, that, as far as the weather stress items of maintenance of a toll bridge is concerned, the child trundling across it with her doll at two miles an hour should be charged ten times as much as the automobile spinning across it at 20 miles an hour?

A. If the cost is made the basis of the charge for the service and the child and the automobile respectively had exclusive use of the bridge, I think that that conclusion follows.

Q. And that would be true even though there was nobody to use the bridge for that week or month except the child and the automobile, because the idle time for the rest of the month should be charged ratably to the time occupied by the child wheeling her doll across the bridge and the time occupied by the automobile spinning across at 20 miles an hour, each being a use exclusive of the other?

A. I think that follows. We are of course endeavoring now to find costs that have taken place in the past. It is not a new plan; it is very old; the application of it to railroad practice is the only thing new about it.

The Master: With regard to apportionment of waste time you were speaking of the other day, what is the connection between time wasted and time used that makes it proper to apportion time wasted on the basis of time used?

A. It has this connection; if statistics are being compiled for the

1277 purpose of ascertaining how cheaply the service can be performed, with the intent to get enough business to keep the facilities full all the time, then your statistics should be cast up without regard to idle time, because the idle time can be availed of, in the event you can sell your goods so cheaply that you can get enough business to completely avail of your facilities, but if, on the other hand, you are trying to find out what it did cost you in the past to make two different things, it is good practice and customary and standard cost accounting practice to charge to the two things the idle time on the same relative proportions as the availed of time.

The Master: The road is holding itself in readiness for the freight traffic and passenger traffic, one as much as the other, when it is not being used, isn't it?

A. Yes.

The Master: Why shouldn't it then be apportioned equally, if at the time it is idle it holds itself in readiness for either branch of the traffic?

A. We are trying to determine what happened to it in the past. Now, if, as a matter of fact, in the past, let us say 90 per cent of the time used was in freight business and 10 per cent was in passenger business, but the sum total of these was only 50 per cent of the whole available time of the road, then it would be quite clear, I think, that the expectation of the road, looking toward filling up the other 50 per cent, would be to get 90 per cent freight business and 10 per cent passenger business; not that half of the other 50 would come from freight and half from passenger when 90 per cent of that which had been used was used for freight and only 10 per cent for passenger; I think it would be an unreasonable expectation.

The Master: I am unable to see why, in regard to the past,
1278 the unused time should be apportioned on the basis of used time. It would seem to me, if it is apportioned unequally, that it should be in the inverse ratio rather than the direct ratio.

A. No sir, I don't think that would be reasonable. What happened; what were the conditions existing in the territory? It would be perfectly good accounting to say that the wasted time should be charged neither against the passenger nor against the freight. You can say it should be charged against neither, and should form the subject of a fiscal charge, or general loss, against the capital of the company, but it wouldn't be good accounting to charge it equally.

If the company has gone into a business in which it has established a plant vastly greater than can be availed of by the goods it can sell, then the cost of maintaining that plant or the excess part of the plant may be in the nature of a charge against the fathers, if you please, of those who built up such a big plant. That is the only place it could be charged, unless it is distributed ratably between the services on the basis of the actual availment by each, and that principle is universally recognized in cost accounting, and can be found stated in many books written by authors of standing. This time element is used as a factor to divide weather stress expenses related to the main line, merely because that is the common portion that is to be divided—the main line and passing tracks ancillary to it. The principal part of the amount that I have distributed on the weather basis is the maintenance of the main line and operation of it.

I don't intend to criticize anyone at all, but it may be you over-built if you built any railroad at all. I certainly meant no reflection upon the policy of your company, but it might be that you had a railroad where there was no business for a railroad
1279 whatsoever. I do not intend to imply any criticism as to the location of this road, or claim that it is over-built; I am merely connecting up your question with my remarks to the Master. It might be that you people may have built a railroad where there was no business for a railroad, but that is not within my province.

Q. I would like to have you give attention to the question closely, because I have written it out almost entirely. It appears that the

density of train movement is very light on this road, and that many more trains could be run. Now, assume that a freight train moves 6 miles between passing tracks in 30 minutes, but does not interfere with or delay any other train, why should it be charged more on account of the weather stress items, like fences, bridges, etc., than if it made that six mile run in six minutes? I would like to have all of your reasons for that?

A. My view on that is this: The items of expense which run with time and have no relation to mechanical wear caused by any particular service, should be charged against the services in relation to the time through which the traffics availed of the facilities. Thus, the freight traffic, were it carried in common equipment, would be chargeable with the expense of such equipment during the time that the freight was loaded in it, and likewise in respect of the time that the freight trains are availing of the tracks. That seems to me to answer your question, but, if it is not in sufficient detail, I should be glad to go further.

Q. I am satisfied with it, if you are.

A. Well, you have the advantage of me, of having seen your question written out; I have not. If, after I see this in writing, I want to expand it, I should be glad to avail of the opportunity. I think of nothing further at the moment.

1280 Mr. Butler: I would like the record to show that you have had full opportunity to give all of the reasons that occurred to you at this time, and also that you be insured opportunity to expand your reasons if after reading your answer you would like to do so.

I did not ascertain what the operating percentage on the total passenger business in Michigan would be on the basis of my determination of its cost after eliminating the amount that I assigned as the cost of the sleeping and dining cars. I made no attempt to get any figures in respect of revenue. My own view is that the operating ratio is a comparative figure only. That is to say, its principal use is in comparing one year with another on the same road.

The Interstate Commerce Commission statistics show it, and they make the comparison one road with another, possibly, but, whereas that comparison is very frequently taken by people to indicate the degree of expensiveness of operating, as a matter of fact, it does not necessarily show that, because one of the elements is the amount of money received, which would be affected by the rates, regardless of the cost of operating.

Q. By taking from Complt.'s Ex. 48, Delf, sheet 3, the revenue of $805,532 for the passenger, and $9,634 for baggage, giving a total of $815,166, and dividing it into your operating expense after eliminating the $112,000 which you assign to the dining and sleeping car, there is left $364,809. Also, eliminating the $57,000 odd which you assigned to mail and express, it is disclosed that the operating percentage for the total passenger business in Michigan on the

basis of your calculation is 44.7%. Is that a high or a low percentage when compared with other roads generally?

1281 A. It is a very low percentage when compared with other railroads generally. But, in making this comparison, it is necessarily made with figures which are not comparative; i. e., in the expenses of roads generally, the cost of hauling sleepers and diners and mail and express is included. Including that, and making calculation on the same basis, the operating percentage is 57.7. It is a low operating percentage. The conditions on the South Shore, especially the sparsity of traffic, the few persons per car and per train, and all that, make for high cost to earn a dollar.

I would expect a much higher cost on the South Shore than I would on the New Haven, the Pennsylvania, the Baltimore & Ohio, or the Norfolk & Western, which is perhaps the best Southern freight road. I do not know whether the South Shore would be able to earn a passenger dollar any cheaper than the Norfolk & Western. I know there has been an application for increase of rates in the east. I have followed the application for an increase of rates by eastern railroads, and know of the Government's employing Louis D. Brandeis, a very eminent lawyer of New England, to represent it in those matters. I remember newspaper comments on his argument on April 30 and May 1st, before the I. C. C. I read the article in a daily paper.

Q. That argument is abstracted in the Railroad Gazette of May 22, 1914, page 1133. It is there indicated that the roads have been unable to introduce in the passenger department economies that have been introduced in the freight department, and that in consequence the expense incurred in the passenger service has increased much more in proportion than the earnings from passengers, mail, and other passenger train business, that on all roads in the eastern territory which try to allocate their freight and passenger

1282 expense, the passenger business is being handled at a loss. I want you to assume for the purpose of your answer that the statement I have made, as taken from Mr. Brandeis' argument, is true in point of fact, and then ask you whether or not on that assumption you do not readily reach the conclusion that your determination, that it costs only 44.7 cents in Michigan for the South Shore road to earn a dollar in the transportation of passengers is wrong?

A. No, I do not reach that conclusion, and there are reasons for that, one of which I would like to state.

Q. It is also stated in Mr. Brandeis' argument that Harold Elliott, of the New Haven road, reported to the stockholders, according to Mr. Brandeis, and "He said more than 50 per cent of the revenues comes from passenger trains and for passenger trains the cost of operation is so great as to leave nothing whatever for taxes or investment." Now, I want you to assume that that statement concerning the New Haven road is true, in fact, and ask you whether or not that would in your mind tend to shade any doubt whatever upon the correctness of your determination, that the South Shore road, in Michigan, can earn a passenger dollar on the one basis you have used for 44.7 cents and on the other basis for 57.7 cents.

A. No, it would not.

Q. It is also stated in this abstract of Mr. Brandeis' argument, that: "The science of railroad cost accounting is almost in a rudimentary state, but Mr. Willard"—meaning Daniel Willard, president of the Baltimore & Ohio, "an experienced and efficient railroad manager, when he came upon the Baltimore & Ohio Railroad in 1910 recognized that an attempt must be made at once to separate passenger service from freight service so far as cost accounting was concerned, and we have, beginning with 1910, an attempt to allocate expense between passenger and freight. A considerable success has been attained, in allocation specifically of 70% of the total, leaving only 30% to be apportioned. Taking these figures subject to all of the criticisms which we know they must be subject to owing to the limited perfection in the comprehension of railroad science, and what do we find. We find taking the figures for the first full fiscal year which we have, the year ending June 30, 1911, and comparing them with the figure for June 30, 1912, exactly what we would have expected in respect to traffic under Mr. Willard's efficient administration because the broad ratio of operating expense has been reduced in that two year period from 68.16 per cent to 66.44 per cent or nearly two points. At the same time what do we find in regard to the passenger traffic? We find that the passenger cost in those two years, according to these figures, has increased from 82.39% to 106.23%, showing according to those accounts that the passenger traffic in the year ending June 30, 1913, absolutely cost the Baltimore & Ohio Railroad six points above, that is 6%, without taking into account capital charges. Applying that upon the total passenger revenue we make the increased operating expenses for the passenger train service of over four million dollars more, as a matter of fact, than the total amount that the 5% advance upon all the freight rates would amount to taking the year 1913 as your basis."

1283

Now, I ask you to assume that the statements which I have just read are true, in point of fact, and then ask you your opinion whether or not they shed any doubts or questions upon the correctness of your determinations, first, that on one basis the South Shore road in Northern Peninsula of Michigan can earn a passenger dollar for 44.7 cents and on the other basis for 57.7 cents.

A. No, they do not, to my mind. I did not consider them comparative.

Q. Mr. Brandeis also is here reported as making this statement concerning the Pennsylvania:

"On the Pennsylvania system it is not a new thing to separate the accounts. They have been doing it for just half a century. Every year the Pennsylvania road has given to its stockholders a statement showing the separation of freight and passenger earnings and expenses. It shows exactly the same trend which he found on the Baltimore & Ohio. The figures are somewhat different the spread is somewhat different. And it may be because of difference in the efficiency of management. But what do we find? We find that in 1907 the operating ratio of the Pennsylvania for freight was 71.6 per cent. In 1913 its operating ratio was 73.4 per cent. There is a

difference of 2.2 per cent. In these six years you have had no doubt ten or more per cent increase in wages; you have had an in-
1284 crease in taxes and you have had those increases in legislative burdens; but the efficiency of the Pennsylvania management dealing with its freight has enabled it to keep down these operating expenses to 2.2 per cent and keep them down there in spite of that liberal charge of maintenance and equipment and maintenance of way on which Mr. Lyon and Mr. Thorn have spoken. In 1907 the passenger ratio was 74.4 per cent. It differed there very little from the freight, which was then 71.6 per cent, an increase in these six years of 18.2 per cent whereas the freight ratio had risen 2.2 per cent."

Assuming that the statements that I have just read to you concerning the Pennsylvania are all true in point of fact, are you still of opinion that the South Shore road in Michigan can earn a passenger dollar for 44.7 cents? I want you to assume that your figures when divided by the proper amount of revenue, disclose that fact, to-wit, that, on the basis that you have used, a passenger dollar can be earned by the South Shore road in Michigan for 44.7 cents, and then ask you, assuming the statement concerning the Pennsylvania to be true, whether you are of the opinion that the South Shore can earn a passenger dollar in Michigan for 44.7 cents; that is the opinion I want.

A. My opinion in this case is the same as that stated by me.

Q. Are you of opinion that the South Shore road, in Michigan, in 1912, did, in point of fact, earn a dollar in the passenger business, on the basis you employ, for 44.7 cents.

A. I have no opinion about that, because I do not know what they earned. Assuming that your statement of the earnings are true, I think they did, and feel pretty certain about that.

Q. Concerning the Norfolk & Western, it was said by Mr. Brandeis, as reported in the Railway Age-Gazette, as follows:

"To the south of the Baltimore & Ohio was another railroad which everybody recognizes is peculiarly well managed; allied with
1285 the Pennsylvania and having in Mr. Johnson an extremely competent president, the Norfolk & Western. Its conditions are different. They too have undertaken to separate the passenger and freight service. They have done it since 1907. Apparently when they started they took as their basis the same operating ratio for the two, which was 64.8 or 64.7, the operating ratio of both freight and passenger. What has the movement been? In freight but slight increase. It increased from 64 to 65, an increase of a little over one point, but in the passenger service the increase has been 64 to 72."

Now, I ask you, assuming that the same method for the determination of the operating ratios, freight and passenger respectively, was on that road followed from 1907 down to and including 1913 and applied to the results of each year, whether or not in your opinion the cost of doing the passenger business has been advancing in the last 6 years?

A. I think that that would indicate that the cost has been so advancing.

Q. Now, I want to ask you whether or not in your opinion, assuming the statement concerning the Norfolk & Western, the Pennsylvania, the New Haven and Baltimore & Ohio, which I have read to you in this morning's examination, to be true, and assuming further, that the methods for the ascertainment of the operating ratios, freight and passenger respectively, were well adapted to disclose the actual truth, and the best that could be devised by skilled accountants familiar with the property concerning which they keep the accounts, the South Shore road had an operating ratio in its passenger business in Michigan in 1912 of 44.7 per cent, on one basis you have stated, and 57.7 per cent on the other? Assume that derived by dividing your operating expenses by the proper amount of revenue? I would like to have you answer it, in the interest of saving time, affirmatively or negatively, and then explain
1286 your answer, and not only that answer, but give the reasons which you asked permission to give sometime ago and which I asked you to defer until I had concluded on these matters?

A. Yes. In response to that portion of your question which directed me to go back and state some reasons that I was about to give in explanation of one of my earlier answers, I will now say that I consider that the conditions of operation of the roads that you have mentioned, and the expense items that came into their accounts, are wider than from those which appertain to the South Shore road, and among these are the facts that a number of these eastern roads have very expensive passenger terminals, the cost of whose upkeep is admittedly an expense which is out of proportion to any additional revenue that might be derived because of the expense of such terminals; that of the Pennsylvania, in New York, I am informed cost so much money that the charges for depreciation and interest on it amount to about $1,000 a year per mile over the whole system. The cost of upkeep would include depreciation and operating expenses attendant on maintenance of the buildings, and I have not now before me any figures which separate these from the interest charges. I was also intending to refer to the expenses of terminals jointly used by the B. & O., Pennsylvania and the Norfolk & Western, in Washington, and the expensive terminal of the B. & O. at Baltimore, and others. Further, these railroads run large numbers of heavy, high speed trains which are made up largely, and frequently entirely, of sleeping and parlor cars, and the earnings in these trains, which frequently carry but a small number of passengers proportionately, are low relatively to the large train expense; and the expenses that these roads charge against the cost of passenger service include all expenses of hauling such cars.

The New Haven is not comparable with the South Shore, for several reasons. One is, the New Haven does a large com-
1287 muter business, with low rates, running about 6 miles. They haul more people in a car than the South Shore.

One of your questions assumed the same methods of accounting had been in vogue during all the period mentioned, and others did not make that assumption, and if as a fact changes in methods

of accounting took place during the period, they might materially affect the results shown, and further one of your questions assumed that the method of cost accounting was the best that could be devised, but other questions did not make a like assumption.

Q. I want you to answer on the assumption that the accounts were well kept and the best that could be devised to show the truth?

A. And I will continue to answer as before I was interrupted. That is, as a matter of fact, these systems of accounting were not so devised as to show the truth; the error well might become cumulative through a series of years.

Q. My question requires that you assume that they are the best that could be devised to show the truth?

A. On that assumption, I gave full and complete answer as I was requested to, "Yes," and then I paused to indicate I had completed my answer and I made no attempt to qualify or modify my answer, and then I stated, I think very clearly, that I would continue, as I had been directed to do, to give an explanation of the reasons why I was going to modify an earlier answer, and those reasons I was giving when I was interrupted.

I am advised by counsel that, where I have begun to answer a question which was made to me upon the record and have answered a part of it and opposing counsel instructs me to modify his original question, I should proceed to answer the original question
1288 as I was answering, unless the entire record be stricken from the stenographer's notes, and in view of that instruction from counsel I will now continue to answer the earlier question as it was originally put, as I understood it, just what I was doing when I was interrupted, and I will go on to say: That this is also involved in the figures introduced in the Eastern Rate cases, namely, the possibility that if the rates of passenger fares had been reduced the passenger earnings as a whole would have increased and the profitableness of carrying passengers might have increased. That completes my answer that I was endeavoring to give to the question at the time I was interruped. A number of these eastern lines, some of them especially, are exposed to active competition in the passenger business from interurban electric railways.

Q. On page 19 of Defts.' Ex. 72, Thompson, there is a ratio called Ratio 2, and part of that is freight exclusive 13.32. Is that 13.32 correct, and if it be not correct, give us the correct figure, if you are ready, and if you are not ready, say so?

A. It is correct, as I intended to make when I made the exhibit, because at that time I did not have the information that some sidings were maintained by the individuals. I am prepared to furnish the figure which will express the subtraction from sidetracks and the like and those which are maintained by the individuals, and the result is to decrease the figure of 13.32% by 62/100ths of one per cent, leaving the figure 12.70%, with a like increase, of the figure 86.59%, by 62, to 87.21%.

I stated yesterday that if it were the fact that mining spurs which I included as sidetracks were heavy traffic spurs requiring

1289 large expenditures for maintenance, in such case I thought it would be requisite for me to transfer those spurs from sidetracks, where I had grouped them, to main tracks. Since the session of yesterday, I have looked into the subject and have discussed it with Mr. Hone, my engineer, who was more familiar with it than myself, and I have also read certain portions of the record in this case in which plaintiff's witnesses testified that the cost of maintaining these ore traffic spurs is about 25 per cent more than the cost of maintaining the sidetracks, and also the testimony of plaintiff's witness, Delf, to the effect that the cost of maintaining sidetracks as a whole is about a third of the cost of maintaining main tracks, and in view of these things I think I do not care to adjust my percentages further by carrying the mine spurs from side to main tracks.

In respect to account 63, "Station Employes", I adopted Mr. Delf's figures so far as he had allocated them, and then I divided the common on the allocation.

I agree that if, at the Soo, St. Ignace, Houghton, Ishpeming, Negaunee or Marquette, there were no exclusive passenger employes and only one or two on the line, it wouldn't get right results to make the division by the allocations, because it would take all the common into freight, practically.

Of the sum total allocated by Delf to passenger and freight, passenger exclusive amounting to about 15 per cent and to about 85 per cent of the total, assuming that Negaunee and Ishpeming would be fairly representative, then it would charge too little against passenger. The Soo is a very important station, and the fact that it has no exclusive passenger up there, because of the Union depot arrangement, would have some bearing upon the cor-

1290 rectness of dividing the common on the basis of the allocations. If it be a fact, for example, at Houghton, that the exclusive freight employes are engaged in handling freight, that doesn't affect the work at the intermediate stations on the line. That would also tend to impair the correctness or veracity of the division on my basis of dividing the common by the allocation percentages.

The correctness or incorrectness of my basis of dividing the common portion of this item depends upon a study of the situation and an analysis of the work done by the exclusive freight and passenger men, and all of the facts bearing upon the question. I did not verify these figures or analyze the work of thee men, as in the Lackawanna case, to find closely what each man was doing. I kept very close track of what my men were doing, but I did not attempt to check their figures back to the records or find out what your station men were doing, except as disclosed by the figures in the payrolls or accounts.

In connection with what you have just said about my personal familiarity with these things, I would like, if I may, to be permitted to state to the Master and because it has been stated on the record very strongly by counsel for the plaintiff that "this witness appears to be unfamiliar with the details," that at the time this work was

under process, and it was completed early last summer, I was very familiar with all that had been done and could readily have discussed any of the detailed subjects, although, of course, I couldn't have gone into the question as to whether transcripts were correctly made from plaintiff's record, and that since then, about the middle of October, I was very seriously injured; my spleen was ruptured by a collision between an electric baggage truck and
1291 myself, and I was in the hospital for some months after it; verw narrowly escaped; and one of the effects of this injury, and the surgical operation which followed, was to markedly impair my memory for details, the things that were in my mind before; but since then I have endeavored to get back into my mind the details in this case, but I was instructed by counsel that it would be unnecessary for me to spend a great deal of time and study endeavoring so to do, as the matters of detail could be proved readily by my assistants, and it would be sufficient if I was familiar with the principles involved.

I adopted Mr. Delf's division of the station employees in this case as follows: He allocated the Michigan total to passenger, freight and common. I divided the common on the basis of the allocations made by Mr. Delf to passenger exclusive and freight exclusive in Michigan. I subsequently reduced the charge to passenger by 10 per cent assigned to mail.

I found that 2.75 per cent of the total freight time in this time calculation on which Ratio 4 is based was due to the delay of freight trains on account of the passenger business. That 2.75% was subtracted from the freight time. It was not added to the passenger. Assuming it right to add it to the passenger, the time and not the per cent should be added; that time would be more than 2.75% of the passenger time, or over 7%, as the passenger time is less than the freight.

The truth of the results produced by the train mileage basis, or the degree with which the results of that basis would approximate the truth, would vary with the speed as well as with train loads, and with train constituents and with weights and number of wheels and wheel impacts, and all of these various items.

1292 I wouldn't say it was my opinion that there are no refinements on plaintiff's track that are not made on account of the passenger business. I am not familiar with the manner in which this company does in fact remove snow and ice in case of storms, and did not intend by anything I have said, in direct or cross, to indicate what the fact is in that regard. I thought the fact was immaterial. I have no doubt that they hold the freight trains until the storm subsides, but I don't think the fact is that they plow it for the benefit of the passenger trains; I consider that notion absurd, and I would consider that absurd if I had never been on the Northern Peninsula and had never seen the road.

Q. And you would set up your opinion against Mr. Lytle, who has spent his lifetime operating that road, wouldn't you?

A. In that respect, I think Mr. Lytle had not analyzed into what

he was saying. I think, in general, passenger trains ought to be preferred over, and have the right of way against freight trains.

Q. In the opinion of the Buell case (1 Wis. R. C. 427), to which you referred in your direct examination, I find this statement: "Thomas F. Woodlock and others hold that that part of the cost of maintenance which depends upon traffic should be apportioned between the different departments of the service on the basis of the locomotive mileage, switching included. This position may be well taken for many authorities hold that the locomotive mileage alone is responsible for at least one half of the wear and tear of the track." Do you agree with the statement that the locomotive mileage alone is responsible for one half of the wear and tear of the track?

A. No. I disagree with that.

Q. Do you agree with the statement that the engine mileage, plus freight and passenger switch engine mileage respectively, when
1293 there is no separation between terminals and line, is a proper basis for the apportionment of the common expenses due to wear?

A. In respect to that, I think if the switch engine mileage is added the result comes nearer the truth, but I don't agree with the method. I think it is wrong. A locomotive on a passenger train is, as a rule, a much greater percentage of the total weight of the train than is the locomotive on the freight train. The locomotive weight does more damage to the track in respect of impact injuries than an equal weight of empty cars, though in respect of static load it is less so. As to loaded freight cars, I think that, in the case of some of the modern freight cars with very heavy axle loads, the difference is not so great. There is a static load when the train is moving. The static load is a load when the train is at rest; that load continues when the train is in motion and is increased by what engineers call the dynamic augment.

Q. A moving load is dynamic augment into static load, and you have only static load alone when the thing is standing still.

A. You have static load when it is standing still, but it is not "into," as you stated, it is "on to." I have a general recollection of the Buell case, but I don't remember its details.

Mr. Butler: It is just preceding page 425, the discussion of several pages there; that is what I draw from it, that the railroad companies claim that the train mileage did not assign to the passenger enough of wear items. Then I find, on page 425, this statement: "If this conclusion is sound it must inevitably follow that that part of the expenses under maintenance of way which depends upon or is caused by train mileage, may be fairly apportioned between passenger and freight traffic on the basis of the train mileage."

A. Well, I will have to answer that in two sections: I will
1294 say that, as a hypothetical answer on the assumed state of facts, I would be forced to agree, but, as a matter of fact, my opinion is that the notion among railroad people, that a passenger train mile is equivalent to a freight train mile, is a mere inheritance from early days when freight trains were light, and that the increase in the

weight and length of freight trains has entirely changed the circumstances.

Q. Was that the old rule?

A. It was the old, early rule, yes.

Q. And even as late as a few years ago it was universally used to divide the common expenses, wasn't it?

A. I don't think it was generally used at all, but it was included in reports of some companies down to about 1893, as I recollect. The train mileage as the basis for the division of the common expenses was used in some of the following cases: The Minnesota cases, the Missouri cases, the Arkansas cases, the North and South Dakota cases, and the Lackawanna case. I have a list which is set forth in a publication of Mr. Muller's that shows comparatively all the various bases that have been used (Defts.' Ex. 80).

Assuming a straight track, a steep grade and a train going up it, grade is not an element of impact. I would not say that, if you were running a train 60 miles an hour up a five per cent grade, there would be no impact on the grade. There would be. The speed which is to be squared is the speed of impact of the weight upon the track, not the speed of the train. In the case of a locomotive, the chief causes of impact that vary with the speed are the imperfect counterbalancing of the side rods, the angularity of the main rod, the rocking of the engine upon its springs, the effect of the reciprocating motion being applied first at one side and then at the other, in respect of sideway stresses, and the imperfections in the track, as at low joints. Track that is subject to carrying heavy traffic becomes depressed, particularly at the rail joints, and at these points of depression the blow of the engine is increased; furthermore, when there is no depression, there is impact as the wheels jump over the slight open space between the rails.

1295

Going to the cars behind the engine, the principal cause of augmented impact is to be found in the difference between the type of springs under the different cars. The term "critical," properly used, means the point at which the injury due to speed begins to decrease, and thus, in the case of very high-speed trains, the injury to the rail joint is less than in the case of lower-speed trains, but this same term "critical" is frequently used, in a somewhat improper sense, to mean the point at which the injury increases. The true meaning of the term "critical," in respect to a change in effect, is a point at which the acceleration of change becomes retarded and the contrary effect from that which perhaps might have been expected occurs.

It has been determined by experiment that trains running at very high rates of speed fatigue the rail joints less than trains running slower. The difference in the effect of speed on a long and short span bridge is, as I understand it, that on the longer span bridge the elasticity of the steel absorbs the shock. I am not aware that there have been any experiments to determine that thing on a wooden bridge. These conclusions have been a matter of research by me. I consulted a number of books in respect to this particular thing.

Mr. Sellew's book, so far as I recollect it, doesn't refer to critical

1296 speed in respect to spans on bridges, although it does refer to the German experiments that determine that high speed trains injure the track less than the low speeds; I mean the very high speed trains. Some of the other books that I have read in the matter are Tratman on Railway and Track Work and Byers on Railroad Operation. I think that their discussions in respect to the effect of speed have to do with the effect upon the tracks.

In respect to the bridges experiments, the matter was excerpted and brought to me by my former chief engineer, Mr. John S. Worley, now a member of the Federal Valuation Board of the United States Government. My recollection is that it was in the form of about a page of typewriting. I don't remember any other paper, writing or document, and my recollection is that Mr. Worley told me he couldn't find any other. Mr. Worley is a very talented civil engineer, is experienced in matters of bridges, though he is not by profession a specialist in bridge engineering. I recollect, however, that his opinion was confirmed to me by Mr. Franklin M. Hill, a specialist in bridge engineering.

I should expect the critical speed would have the greater effect on the stringers and girders than upon the floor beams; while I cannot tell you definitely why I think so, that would be my opinion. Impact is greater when simple locomotives are used than when compound locomotives are used, because of the better balancing of the compound locomotives. Vibrations are cumulative in both, but the cumulation would be greater in the simple engine because of the greater variation in comparative thrust communication to the parts of the locomotive at separate points of time. By thrust, I mean the power applied to the piston and communicated from the piston rod, or communicated by the piston rod, to the connecting rod, or communicated by the connecting rod—here I mean the main
1297 rod—to the wheels and the side rod. I think rough and flat wheels are noticeable on floor beams and truss members, and that the effect would be greater upon the floor beams. Floor beams are more closely related to the point of impact on the rail than on the trusses, and the effect would be considerably absorbed before it reached the trusses.

It is generally considered by engineers that excessive elevation on curves increases resistance and makes the load harder to pull. The coning of the wheels that I spoke of, or that you spoke of, whichever it was, in respect of the travel of the wheels around the curves, wouldn't have the effect that you apparently said it would have, i. e. of equalizing the distance of travel of the wheels around the curve, because, if the outer rail is properly elevated upon the curve, the effect would be to reduce the curve to the conditions of a straight track and the wheels would run centralized between the rails, just as they did on a straight track. Now, then, as I understand it, the purpose of the coning of the wheels is not to equalize the distance of travel around the curve, but to cause the wheels to ride in such a manner that the flanges will remain at a little distance from the rails and not cut the rails heads, and if, as a matter of fact, the passage of a freight train around a curve was at a slower speed than the passage

of a passenger train around that curve, the effect of coning would be to produce exactly the contrary effect from that which would seem to be intended, if they were intended to equalize the distance of travel around a curve.

Furthermore, I have produced and examined a copy of the Master Car Builders' rules since adjournment yesterday, for the purpose of ascertaining the limits of wear under which the Master Car Builders' require the wheels to be changed, and I find that the limits of
1298 wear do not take place when the coning is ground off and the wheel becomes cylindrical, but considerably later, i. e., when th cone has become reversed. I am still of the opinion that the wheels have to slip around every curve, one or the other, or both of them, in one or the other or both directions.

Q. Do not slow, heavy trains around curves, where the outer rail is elevated, tend to increase the elevation of the track because of the lightening of the pressure on the outer rail?

A. The tendency from the cause which you have mentioned alone would be that which you have said, but there is another tendency, namely, the tendency of the wheel to continue upon the tangent, which tends to cause the wheels to climb up to the outer rail. That varies with the speed, but more with the character of the equipment—the readiness with which the trucks swing upon their king pins. Thus, in freight equipment, where the wheels do not turn as readily as on passenger equipment, there is a greater tendency for the trucks to ride upon the outer rail, and the wear, as a matter of fact, is found to be much greater on the outer than upon the inner rail. Therefore, it would be my judgment that the tendency of the heavy train to depress the inner rail would be counteracted by the causes just mentioned.

Q. The Committee of Economics of Railway Location of the American Railway Engineering Association reported, among other things, in 1913, to the Association as follows:

"In studying average maintenance expenses by divisions for a period of years on the large system previously mentioned, it appeared that the best unit of traffic measurement of the expense was what we will term the equivalent ton miles, the total equivalent ton miles would be the sum of the following: double the freight locomotive mileage, times average weight per locomotives; four times the passenger locomotive mileage times average weight, total freight ton miles, (car and contents), double the passenger ton miles, (car and contents). This unit considers that one ton of passenger car does double the injury of one ton of freight car and that one ton of locomotive affects
1299 the track as much as two tons of the train back of the locomotive. This unit of measurement even, best fits the increase of maintenance of buildings due to increase of traffic and consequent increase in number and size of buildings. Passenger traffic demands a higher type and better grade of maintenance than freight and even a better type of shop buildings for repair."

Assume that that report was made, I want to ask you whether or not you agree with the statements therein made?

A. The statements therein made refer to the particular railroad

under examination, and I should judge from what was said that that was a railroad on which very high-speed passenger trains were operated. It is my judgment that in the case of such a road there is a very considerable amount of expenditure for maintenance that has to do with the comfort of passengers under those high speeds, and I think that, if the circumstances are such as I have related, the report of the eminent engineers in the case would have great weight in the case to which they refer, but I understood counsel to say that it referred to the case of a particular railroad which was under examination, and not to a road like the South Shore, on which speeds are comparatively slow.

I don't think that critical speed, so-called, may be as low as 27 miles an hour, as a practical matter, on the South Shore. The term "critical speed" is that speed at which the increasong injury due to elements attendant upon speed would begin to be marked—that speed at which, in a general sense, the elastic limit of the track structure as a whole would be reached. It is my opinion that on this road that limit will not be found under somewhere from 30 to 40 miles. It would be found on some of the passenger trains which made a higher speed than 27 miles an hour and are included in the average, but, also, it is a fact that freight trains on this road, particularly on descending grades, make speeds comparable with the higher speeds of passenger trains.

1300

I don't think that the greater cumulative vibration and greater impact would be found with the passenger engines, which average the 27 miles, rather than the freight engines which average 16 miles, because I think the cumulation of the impact would be found where there are many wheel impacts, as in the case of a long train, and freight trains are much longer than passenger trains. Critical sped may occur at any place on the track, in the sense that I have stated. In this sense, I think it would frequently occur with the freight trains on this road where there were no bridges or other openings in the embankments; I think more frequently on the passenger trains.

Cumulative vibration takes place on straight embankments, either level or uphill or downhill embankments. The vibration is of a part of the entire track structure together with the depression of the entire track structure caused by the passage of the train.

The heavy engine depresses the track structure so that even on a level track the engine is running uphill all the time, just like a man walking a slack rope, only lesser in degree. Right in front of the driving wheels, taking the weight, you always have the incline immediately due to weight. The springing back of the track, the rails and the part immediately below it, is a process that takes some time. It springs back in the major part quite quickly, and the remaining restoration takes a good deal longer, and where the train is long, and there are a number of wheel impacts, the effect becomes cumulative; that is to say, the succeeding wheels continue to strike the depressed portion, before it has risen. The impact is increased by reason of the rise in rails immediately ahead of the greater weight of the locomotive. In that connection, while the speed is greater the depression is less; therefore the effect

1301

that you (Butler) have compared to going uphill is less at high than at slow speeds.

Greater speed, or increased speed, tends to lessen this impact, because it doesn't settle so much as in the static load. In respect of that particular subdivision of impact, the greater speed lessens the effect. That is why the trains running at very high sped were determined in Germany to be supportable by a lighter track structure than the trains running at lower speeds. It is not the practice anywhere to have lighter structures for fast trains than you would have for the same trains if they went slow. I think that the fact is that the heavier structures are built to sustain the heavier weight of increasing train loads.

I think that speed is a factor, but I don't think that the practice of increasing the strength of bridges and the weight of rails has been occasioned by increases in speed. On the contrary, as a matter of common information and general knowledge, such increases in strength have been due to increases in train loads, and the increases in speed during recent years have not, as it were existed, i. e., the trains ran as fast 40 years ago as they do today, but they were not as heavy; it is the heavier trains that require the strengthening of tracks, the increased amounts of ballast, heavier rails and stronger bridges. Other things being equal, I would expect a structure to be strengthened as the speed increases up the "critical" point, used in the correct engineering sense of the term. Counsel will doubtless perceive that such critical point having been arrived at, the lighter structure would then be equally safe.

1302 THOMPSON.

Redirect examination.

By Mr. Wykes:

The reason I merely substracted the delays from the freight train time, and did not add it to the passenger train time, was that I conceived that the deduction of the delays for the freight trains ought to put the freight trains in the same position that they would have been in if they had not been delayed for passenger trains at all. Also, there were delays to passenger trains caused by freight trains that I might have taken into my computation to the disadvantage of the plaintiff but I did not do so.

That computation I made for Mr. Butler, which the time deducted from the freight trains would bear to the time of the passenger trains if added, was a mere mathematical computation that I made at his direction. I did not intend to have it appear that an addition of about 7% that I computed for him, to the passenger ratio of 30.32%, would produce the correct result; I have during the recess computed the percentage on Ratio 4 that should be used in case it is held that the delay caused to freight trains meeting passenger trains should be treated as a subject of addition to time of passenger trains, and I find that in that case, where my original percentages under Ratio 4 were, passenger 30.32% and freight 69.68%, the recomputed ratios would be, passenger 31.03% and

freight 68.97%. I obtained these figures by adding to the sum total of the elapsed minutes for passenger trains the amount deducted for delays of freight trains.

In making comparisons of operating ratios in the passenger department, it is necessary to know, before any comparison can be made which will be valuable, what distance above the normal operating ratio, or a correct operating ratio, the rates of fare or the
1303 revenue would be. If the operating ratio were 50% under rates of fare of 3 cents, that would be the equivalent of an operating ratio of 75% under rates of fare of two cents, and 65% substituting 2.6¢ for the 3 cents.

I was first engaged by the State in this proceeding in the spring of 1913, before the decision in the Minnesota Rate Case. I completed my report to testify before July 22nd, 1913, and appeared at Chicago for the purpose of testifying at that time. The Minnesota Rate Case having been decided at about that time, my testimony was put over from that time to sometime very much later, due to the changes made in the method of proof by the Minnesota Rate Case. From the time in July, 1913, that I was ready to testify, I have given very little attention to detail figures contained in the report. I have given attention, for the specific purpose of testifying, to the principles underlying my computations. At the time when I was to have testified originally, before the changes were made by the Minnesota Rate Case, I was intimately familiar with all of these detail- of figures. I did not think necessary to prepare in the same detail upon particulars that I had before, and confined myself to principles. I was familiar with the details at that time through my connection with their compilation, and I think I should continue to remain familiar with them if it had not been for the sickness spoken of; to get it up after that, would have required me to study over again the small details, and I have not had the time and strength to do it.

In the Mountain Ice Case, some of the principal divisions between passenger and freight were made on a revenue train mile basis. That basis is different from the basis which I used in this case. I used the revenue train mile basis in that case for these reasons:
1304 First, I had only a very short time allowed me in which to get up my figures in the Mountain Ice Case, namely, about three weeks, second, the records of the Lackawanna were not such as to allow me to discover the gross ton miles, and although I attempted to find it out, I had to give it up; third, that was the first time I had attempted to make a separation, and I was not familiar with the subject as I have since become, and I did the best I could, at that time, according to the light I then had.

I did not look up or refer to what was done by anybody else in such cases. I had no opportunity to. And my use of the train mile basis there followed the old, and what I think might properly be called the extinct, use of the train mile basis. I do not think it is now used in general, except for the purpose of statistical comparison one year with another on the same road.

I started to give the reasons why I had used the revenue train mile basis in the Mountain Ice Case, in certain particulars. I used it

because it was convenient and readily available, because I could not get figures which would have been more nearly responsive to the facts, and because I then was not very familiar with the subject, and the art at that time was in a very rudimentary state compared to that to which it has since advanced. The Mountain Ice Case was heard before Judge Prouty, of the I. C. C., in 1908.

I think the methods I have used in this case would be much more proper, but I think there were some of the methods I have used in this case that would not be equally applicable to the Lackawanna under its different conditions; i. e., to make a similar showing for the Lackawanna, I would not follow the methods I did before. I would follow a method much more near that I followed in this case.

1305 Q. Mr. Butler discussed with you at some length the proposition of adding the switching mileage to the revenue train mileage, on the freight side (both sides), in making divisions, and you stated that you thought that would reduce the element of error in the use of the revenue train mileage basis for division of common expenses. Do you remember who, in divisions of common expenses, ever used the revenue train mileage in that way with the addition of the switching mileage to freight?

A. The computations made by Price, Waterhouse & Co. include switching mileage with revenue mileage, and it is my recollection that Mr. Muller's computations do likewise in respect of some of the accounts, and I think also, speaking from memory, Mr. Worthington's do in some places.

On a number of occasions in my testimony I have referred to the question of accuracy permitted by the accounting records of the South Shore. The compilation of the set of records of the expenses of a railroad involves the constant application of the judgment of the accounting officers as to the accounts to which the items shall be charged and while there are provided rules to govern the accountants, nevertheless, there is necessarily a very considerable measure of judgment of the accountant required to be applied to the items. In so far as that judgment is correct or incorrect, so does the result produced by the accountant vary from correctness in respect of what he sets up to the accounts that he produces.

Q. You answered with regard to the question of whether your results were approximately accurate, and I think had some difficulty in getting to the point of saying that they were substantially or approximately accurate. What was it that induced that uncertainty in your mind?

1306 A. There were a number of things; the principal one was the lack of perfection of the records, when considered as records, for the purpose of making such a computation, and the lack of existing knowledge in the minds of any one or on the record anywhere as to the relative proportion of waste attributable to mechanical wear and weather stress in respect of various things, such as ties. Further if the records of the plaintiff charge against operating expenses any considerable amount spent for capital purposes, it would be included in my figures as cost of operation. I

was cognizant of the fact that there had been two appraisals of the property of this railroad made by Mr. Riggs, one about 1900 and the other about 1912 or thereabouts, and that the difference in costs of reproduction found by Mr. Riggs was very great, and that it was greater than the difference in unit costs which he applied against the items, and that this difference was not accounted for by capital charges on the books, and the necessary conclusions would be that the road had been improved at the charge of operating expenses.

I think that the correction of such errors as there may be in my work would result in decreasing the cost of intrastate passengers transported in Michigan, rather than to the increasing of it. By that I mean to say, the true resulting cost would be less than my figures rather than more.

When I mentioned a 10% range of error as being substantially accurate, I meant 5% either way from correct, a total of 10% margin of error or variation; I think my results would not be more than 5% above or 5% below the truth. If there were no greater variation than 5% from correctness, there would be substantial accuracy.

1307 I see no relation between the revenue train mile made on the Western Division and the cost of repairing a bridge on the Marquette division, or between a flagman stationed at a crossing in Marquette and a revenue train mile made on the line near St. Ignace. The flagmen are located in the yards in the centers, such as Marquette and other considerable towns on the line, more largely than in the country. The switching and train movements occur most frequently in those same yards.

THOMPSON.

Recross-examination.

By Mr. Cotton:

In the Lackawanna Mountain Ice Case, one of the reasons why I adopted the revenue train mile basis was that I only had about three weeks in which to prepare for examination. In stating them, I did not mean that was the most important. I cannot say that at that time the revenue train mile was universally used.

I took 2.75% of delay to freight trains out of the time of occupancy by these trains. I did it on the theory, as I have stated, a little while ago, that the deduction of the amount of time from the freight train time, to put the freight trains in the position that they would have been if there were no passenger trains to oppose them. It would have gotten to the terminal that much quicker.

Q. If it were lying on the freight track to the extent of 2.75%, that time, if it had not been for that delay, it would have utilized in its occupancy of the track, would it not, the main tracks, in getting to the terminal?

A. It would have utilized that time, and so much less at
1308 the end would have been required, so the elapsed time be-

tween terminals would have been the total elapsed time minus the delay, just as computed.

I do not think that 2.75% must be added to the time of occupancy of the passenger trains in order to have exact equality; it seemed to me that that was a point on which I might be overruled and therefore I computed the difference in per cents and stated them this afternoon, showing that the passenger percentage would rise from 30.32% to 31.03% on the time ratio, and that the freight percentage would fall from 69.68% to 68.97%. The difference would not make very material variation in the results.

Q. As a matter of fact, you were complimented by the Commission on the work that you did in this Lackawanna case, for accuracy and correctness in your divisions of this common expense; is that true?

A. I was complimented by Judge Prouty of the Commission for the care in which I did my work and particularly for the conscientiousness in respect of not endeavoring to make a result showing one way or the other.

Q. And that care and conscientiousness involved the use of the revenue train mile basis in a division of this common expense did it not?

A. I cannot answer that yes or no without stating other considerations, known to the court, namely, the short time I had for preparation. I do not think that Commissioner Prouty meant to compliment me on the use of the train mile basis. My recollection is that Judge Prouty expressed some criticism of the train mile basis indicating it was more valuable for merely statistical purposes than for the truth of separations. I am stating that wholly on my memory, and would not swear that is true without consulting the record, but I think that is true.

Q. When Mr. Butler first brought this Mountain Ice Case
1309 to your attention, your memory of what you did there was so perfect that you could not recall what particular method or basis you used at all, is not that true?

A. That is not true. I have seen lawyers read untruthfully from a printed statement, and I desired to guard myself against the possibility of Mr. Butler doing it. I do not mean to imply that I think Mr. Butler would, but I wanted to be sure he was not.

Q. But you have given the impression upon the record that you were not certain what method you did employ there until Mr. Butler read from the brief the method that you employed?

A. I do not know what impression I gave on the record, I know that in my own mind I was not prepared to testify specifically, as to each and every item of 116 accounts, just the method I used 6 years ago.

My second reason for using the revenue train mile basis in that case was that the records of the Lackawanna road were such as not to permit me to use any other basis. The records were not such as to make it possible, within any reasonable length of time, to compute or even estimate the gross ton mileage. Furthermore, there were complications in respect of the suburban passenger traffic, the correct

elimination of the error due to which, or the inference of which, would have taken a great deal of time and effort and for which the books of the Lackawanna were not so constructed as to yield the information. This was 1908, and the accounts examined were the accounts for the first year after the installation of the I. C. C. classification, under the Hepburn Act. At that time, there was great difficulty in that, do the best they might to make their accounts conform to the new classifications; there were a number of differences
1310 which I cannot relate, but they were in general attempting to conform to the classification.

In making the statement, that one of the reasons why I used the revenue train mile basis then and swore to it as a proper method of divisions was because the records of the Lackawanna road were not kept as they should be, I had no reference whatsoever, and I think counsel knows it well, to the question as to whether the records of the Lackawanna conformed to the records or requirements of the I. C. C.; it has nothing to do with the case at all in respect of my answer. I would like to say that the classification of accounts for Additions and Betterments was in an imperfect state during the first year after the installation of the new system of accounts, and that is why I thought that the accounts, Maintenance of Way and Equipment, might not have been quite correct.

Assuming the Lackawanna accounts did follow the I. C. C. classification, my answer would still be that the accounts did not afford the information I needed. I do not think there would have been any differences between the accounts of the Lackawanna at that time and the South Shore at that time (1908). The accounting departments had the same troubles. I think the accounts of either road during that year and the present time, being compared, it would be found that the accounts at the present time are kept more directly responsive to the requirements of the Interstate Commerce Commission. It was impossible to make all of those changes accurately at once on the short notice that the gentlemen had.

My third reason for using that method was because it was my first attempt at separation of common items of expense between passenger and freight. I believe this is the third time I have tried it.
1311 The second attempt was to analyze Mr. Hillman's work in the Minnesota litigation. When I made that division and swore to it, I thought it was as nearly correct as the accounts made it possible to get at the truth. I do not think it was a pretty close approximation, in view of my subsequent knowledge. I think I got the result too low. If I did it over again, I would find it cost more to transport ice. I did not look up what other engineers and experts and accountants were doing in the matter. I had no time to do it; I was given 3 weeks to complete my compilation.

Price, Waterhour & Company, in the employ of the New York, New Haven and Hartford, about 3 years ago, in the Railway Mail Pay inquiry, divided account 2, Ballast, on the revenue train mileage basis including switching; also accounts 3, Ties, 4, Rails, 5, Other Track Material, 6, Roadway and Track, 7, Removal of Snow, Sand and Ice, 8, Tunnels, 9, Bridges, Trestles and Culverts, 10, Over and

Under Grade Crossings, 11, Grade Crossings, Fences, Cattle Guards and Signs, 12, Snow and Sand Fences and Snowsheds, and 13, Signals and Interlocking Plants. The statement which I have before me describes Price, Waterhouse & Co.'s method: "Direct where possible and apportioned on the basis of suitable relative ratios and on the ratio of assigned items."

Mr. Muller used a ratio that involved the same basis of revenue train miles. His description of his ratio used for account 2, Ballast, is: "One half on locomotive miles including switching. One half being the remainder half and likewise in respect of its ties, rails, and other track material and of roadway and track, of tunnels, bridges and trestles and culverts, and perhaps some others."

Q. Am I right in saying whether the principal factor in what you have just read would not be simply a method of the revenue train mile bases after all?

1312 A. Yes, but I think the modification would be very material and that it would be almost all on the side of increasing the freight revenue train mileage, and not the passenger revenue train mileage. I base that on my general knowledge of the fact that the amount of switching done in the freight business is enormously greater than that done in the passenger business everywhere. Mr. Peabody, Statistician of the Santa Fe, has used the revenue train mile basis on some of the common items.

Q. Now at the time that you were doing this work in the Mountain Ice Case, the consensus of opinion among the very best engineers competent to do this sort of work was that the revenue train mile basis, everything considered, was the best and most practical and efficient method to be employed in the division of these common items of expense, Maintenance of Way and Structures?

A. I do not believe that; I do not believe there was any consensus of opinion. I do not think the competent accountants and engineers generally had considered the subject carefully with intent to arrive at correct result. To answer as to the Pennsylvania or the New Haven, or any other road, I believe that it is not a suitable basis for any of them. It might follow out that its results would in isolated cases coincide with the results of a correct computation, but I think that would be a mere arithmetical accident and have nothing to do with the correctness of the method.

Q. But you would expect the officers and engineers of the Pennsylvania Railroad to be pretty competent and pretty well experienced in matters of this sort, would you not?

1313 A. Well, I am going to answer you as well as I can; that is not a question I can answer yes or no. My answer to that is that my opinion of the men would depend upon my notion of what the Pennsylvania Railroad was trying to use those figures for.

Q. Don't you know, as a matter of fact, they have used this revenue train mile basis for many years?

A. Yes, I do. I, further, have been told by representatives of the Pennsylvania Railroad that they do not think it was of any value. I wish to say though, Mr. Counsellor, while I have no intent and

do not wish to introduce or endeavor to bring into my testimony hearsay as testimony, it is true that those things affect my own judgment when I am told them by other people.

Q. Did I understand you to say in your re-direct examination that, if you were to add the switching mileage in this case to your revenue train mile basis, it would reduce any factor of error that you thought there was in the ratio almost to a minimum?

A. No sir, what I intended to say was, not referring to my computation at all, but referring to computations introduced by the complainant, that if the basis of division used by complainant, namely, revenue train miles, were amended, and in its place there were used a basis of division obtained by adding to the revenue miles the switching miles, then I thought that the amount of error contained in the complainant's computations would be reduced.

I admit, and have admitted, and continue to admit unhesitatingly, the elements of imperfection in my computation here because of the imperfection of the records of the railroad. That same imperfection exists as to all railroads in the country generally. The inter
1314 passenger service in Michigan is in fact and in truth more expensive than the intra, undoubtedly to the extent that it is more expensive to handle the accounting for interline passengers than it is to handle the accounting for line passenger business, and we know the larger part of the interstate business is interline relatively than of the intrastate. The lack of information on this subject produced an element of error.

When I say I have not taken this into account, by that is meant I have not loaded the cost of intrastate (inter) business with that item. I do not concede that the intra passenger business on this road in Michigan is more expensive than any other passenger business—that is, than the inter passenger business. I would say, in respect of some of the items it is more expensive, and in respect of some other items it is not, but as to the total amount I am not prepared to say whether it is or is not.

THOMPSON.

Redirect examination.

By Mr. Wykes:

I did not find any record of the South Shore which kept the revenue train mileage by divisions, or by other divisions or sections of the road than the whole. If that basis were to be used, it would be valuable to have the revenue train mile by divisions, as it would diminish the error to segregate the expenses so far as possible into divisions and use the train mile ratio against the division. I did not find any record of the cost of maintaining exclusive freight tracks on the South Shore; what I mean by that is, I found an accumulation of records that could be referred to. There are records of individual expenditures, item by item, that have gone on these exclusive
1315 freight tracks, but they have been merged in the compilation with the other. I found no total separate from the total of the whole road for a similar item.

I did not find any record of revenue train mileage on the exclusive freight tracks, no detail of the switching movement which took place in the first hour at particular places and the reduction of that to miles, nor any record of the switching movement of passenger train cars or of freight train cars separately, nor any separation of the cost of interchange carload lots or less than carload lots, either or both, with other roads. There are none of these things that it would not be material to know if I were making precise separations.

Q. Where any so-called allocation depends upon the use of arbitrary figures, such as locomotive miles or train miles, or features of that character, would you term that an allocation?

A. No sir, that is not an allocation at all; it is a misuse of the term; it is an assignment by computation.

Q. Now getting a little closer to it. Such items as lubricants for road locomotives, assigned on the basis of the fuel for road locomotives, would you term that an allocation or assignment?

A. I would term it a computed assignment.

Q. Take where an item such as fuel, so far as it was common or used in a locomotive in the common service for the time being, and being assigned on the relative mileage in each of the two services, would you term that an allocation?

A. No sir, that is not an allocation; it is a computed assignment like unto other computed assignments.

Q. Is the revenue train mileage basis reliable and accurate for statistical purposes, for comparing the operations or happen-
1316 ings in passenger department in one year against the similar operations or happenings in the passenger department for another year?

A. Under some circumstances it is; what I mean by that is that if the conditions remained relatively unchanged the train mileage basis division becomes an informative statistical method for telling the management what is going on relatively this year with what went on last year, but it becomes unreliable even for that purpose when the flow of traffic or the conditions of traffic on the system does change between one year and another.

Q. Where it is reliable, that is, where conditions remain practically the same with no abnormal changes, is that because it is the comparison of likes?

A. Yes. The value is to show whether the like expenses, for instance, in the passenger department or in the freight department one year with another, have changed.

Q. Now, is its use by railroad companies for statistical purposes for such comparison any argument for its use in a comparison of unlikes, such as the freight and passenger sides?

A. Absolutely none whatever.

Q. Can you find the Buell case (1 Wis. C. R. 101-102), — which Mr. Butler referred in the examination today, where he stated the claim of the railroad companies in that case to have been that the passenger mile was more expensive than the freight train mile? Do you find there a table which contains an examination of statistics

for maintenance of way and for other costs for different railroads? I ask you to read the table.

1317 A. "The formula in question was designed to show that speed was relatively more injurious to the rail and track than weight; or, which is possibly more accurate, to give consideration to both speed and tonnage. It is quite intricate and when applied allots an unduly large proportion of the expenses to the passenger traffic. It appears to be at variance with most other theories of apportionment and with a common sense view of the situation. The formula was submitted for examination to Prof. W. D. Pense of the engineering department of the University of Wisconsin. In his report upon this examination Prof. Pense criticises the formula itself as well as the basis upon which it rests. He also offers some general observations based upon experience or actual tests which, in substance, show that speed is not relatively more injurious to rail and track than weight if as much so. Some of his observations are:

"The wear of the wheel tread is a good basis for estimating the wear of rails.

"The wear of drivers is more rapid on freight than on passenger locomotives.

"The wear of drivers on passenger locomotives is not increased as speed increased.

"Hammer blow of drivers is frequently more injurious to rails with freight service than with passenger.

"Passenger rolling stock is less severe on the track and structures than freight cars.

"Rail defections and roadbed pressures do not increase directly as the speed.

"Cost of raising and tamping track is not increased with
1318 increased proportion of passenger trains.

"The renewals are chiefly due to decay.

"These are substantially the conclusions at which Prof. Pense arrived. They are based on such experiments and observed facts in relation to this matter as have been made and published and it is felt that they are entitled to a great deal of consideration.

"If the passenger trains caused relatively so much more damage to the rails and track than the freight trains as the Company would have us believe, then the cost of maintenance of way should be relatively greater on those roads where the passenger traffic predominates than on those where the freight traffic is the heaviest. Yet this is not the case as the following table demonstrates."

1319 *Cost in Cents per Revenue Train Mile.*

	No. of years included.	Repairs of roadway.	Renewal of rails.	Renewal of ties.	Total roadway, rails, and ties.	Repair and renewal of bridges and culverts.	Total roadway, rails, ties, bridges, and culverts.	Maintenance of way and structures.	Passenger per cent of total revenue train mile.
Long Island	7	9.07	.68	1.99	11.74	1.37	13.11	17.20	88.42
New York, New Haven & Hartford	13	12.16	1.17	2.56	15.89	2.49	18.38	24.68	67.10
Boston & Maine	14	11.32	.92	2.51	14.75	1.88	16.63	20.20	59.14
New York Cent. & Hudson River	11	10.67	1.26	2.55	14.48	1.73	16.21	19.96	51.90
Delaware, Lackawanna & Western	6	12.82	1.40	2.93	17.15	4.60	21.75	31.34	46.38
Wheeling & Lake Erie	5	11.81	2.68	4.16	18.65	2.50	21.15	24.61	37.71
Chicago, Milwaukee & St. Paul	14	10.02	2.55	3.29	15.86	3.37	19.23	25.46	36.53
Lehigh Valley	7	14.65	1.62	4.50	20.77	3.50	24.27	30.10	36.40
Norfolk & Western	9	11.65	2.80	3.06	17.51	3.35	20.86	23.30	26.79
Duluth & Iron Range	6	31.68	3.51	3.43	38.62	2.45	41.07	63.18	15.40
Duluth, Missaba & Northern	6	32.58	10.47	6.28	49.33	8.15	57.48	86.40	12.33

THIS PAGE BOUND

1320 Q. You spoke of certain appraisals made of the South Shore in periods ten years apart? Now, if it should be the fact that in addition to the two appraisals ten years apart there were two appraisals one of which was one of the two that you have referred to, two years apart, and then an analysis of the results of those two appraisals, a reconciliation and a reduction of the items to the same items in each appraisal were made which indicated (on the same prices and on the same inventory each time, the inventory containing such general items as the right of way, roadway and track, and track structure and so on, in different items) there had been an increase of $300,000 in the two years, this all being over and above additions and betterments, would that indicate that there might be an error in your result to the effect or in the way of your results being stated too high in cost?

A. Yes.

I find that the average haul of intrastate passengers in this case is shown to be something under forty miles. That indicates to me that the vast bulk of intrastate passengers are short-haul passengers and have no use for sleepers and diners, and I do not think they should be charged with the expense of maintaining the hauling of sleepers and diners. I think the long-haul passengers should do it, and I think, whether the longhaul passenger is intrastate passenger or interstate passenger, he should pay for the service which he gets and the other fellow does not get.

I think if a man who used the sleeper paid the full value for his service, over and above the mere transportation, then the cost accounts should be kept separate. I am not criticising the management in respect of maintaining the service, but criticise the apportionment of the cost of that service against the pure cost

1321 of transportation.

I mean, in showing the cost of carrying passengers as such, what railroads call transportation, as separate from Pullman, for instance, and in showing the cost of transportation as such, I think we ought to show the cost separate, and that the cost of the special hotel facilities should be paid for by the people who avail themselves of them. Assuming the entire sleeper and diner service of the South Shore were on the Houghton Branch, there would not be any justification or any reason for charging any part of that sleeper and diner against the passenger traveling on the other parts of the line, where there was no such service. I think there is no greater warrant for charging any part of that service against the short-haul passenger who does not use it than there would be in charging it if it were carried on only a part of the line against the other parts of the line.

THOMPSON.

Recross-examination.

By Mr. Eldredge:

Q. Mr. Wykes had you figure out certain percentages on a basis of 2.6 cents per mile passenger charge and 2 cents passenger charge, and they were, as I take it, what Mr. Wykes assumed and you assumed to be the proper percentages, which Mr. Butler should have used in certain questions that he put to you this morning, where he used the percentage- of 44.7 and 57.7. Had those percentages which Mr. Wykes had you figure been used by Mr. Butler in his questions, where he used the 44.7 and 57.7 percentages, your answer to Mr. Butler would have been the same?

1322 A. I take it you are now inquiring as to Mr. Butler's final hypothetical question, in which he put in all the assumptions and enlarged his question and made no qualifications. There is a difference between his questions. He asked a series of questions in which he did not assume all the assumptions, and then he asked one question which was confined entirely to assumptions and that question I answered "Yes," without any attempt to qualify it, and I did so because it seemed to me the fact that these eastern roads were operating generally on two-cent fares or less and your road was operating on three cent fare, it was so obvious it was the only answer for me, and I answered yes.

Q. The questions of Mr. Butler to which I refer are those which he asked you in reference to results obtained by certain eastern roads which he named on quoting from Mr. Brandeis' argument to the Interstate Commerce Commission. You understand those are the questions I refer to?

A. Yes, I understand that.

Q. Now, if Mr. Butler, instead of the percentages which he used in those questions, had used the percentages which Mr. Wykes had you figure here and to which I have referred, your answer to Mr. Butler would have been the same?

A. I will answer yes, now, because, as I understand it, I should answer yes, and if I find any reason to modify it I will do so, and give my reasons.

Mr. Wykes: One thing further that may clear this up a little: Just generally, and assuming the average rate of income for passenger to be 2.6 cents per mile traveled and the operating ratio for passengers found on that to be 57.7, call it 58 for convenience, what

1323 would be the operating ratio on the basis of a revenue reduced to two cents?

A. Approximately 75½ per cent.

(It is agreed that the tabulations which appear on record pages 9860 to 9881, from Thompson's Appendix A, may be marked Defts.' Ex. 72*a* and filed with the clerk and returned as an exhibit.)

UNITED STATES OF AMERICA,
Eastern District of Michigan, ss:

I, Elmer W. Voorheis, Clerk of the District Court of the United States for the Eastern District of Michigan, do hereby certify that the above and foregoing is a true copy of Volume 3 of Narrative Statement of Testimony on Appeal comprising typewritten pages numbered eight hundred and ninety-three to one thousand three hundred and twenty-three inclusive, in the therein entitled cause as the same appears on file and of record in my office; that I have compared the same with the original, and it is a true and correct transcript therefrom and of the whole thereof.

In testimony whereof, I have hereunto set my hand and affixed the seal of said Court, at Detroit, in said district, this twenty-first day of November, in the year of our Lord one thousand nine hundred and eighteen, and of the Independence of the United States of America the one hundred and forty-third.

[Seal of the U. S. District Court, Eastern District of Mich.]

ELMER W. VOORHEIS, *Clerk.*

1324 Vol. 4.

On June 4, 1914.

AUGUSTUS C. HONE, a witness called by defendant.

This witness, an engineer on the staff of M. W. Thompson, had charge of making the computations entering into Defts.' Ex. 72, Thompson. He testified to the correctness of the computations, and that the method outlined by Thompson, and in Defts.' Ex. 72, Thompson, had been carefully carried out and checked, and every effort to secure accuracy followed, that there was no attempt to go back of Mr. Delf's records, and that the totals used were taken from plaintiff's records, with one or two exceptions. The exceptions were for the purpose of using averages to normalize unusual expenditures, as in ballast. The detailed sheets of the computation show all such variations, and the methods pursued.

1325 On June 5, 1914,

ALBERT R. DILLEY, a witness called by defendants.

Direct examination.

By Mr. Wykes:

(Mr. Wykes produced a chart, marked Defts.' Ex. 99 (should be 71), Dilley, June 2, 1914.)

I have compared that chart with the stipulation between Mr. Eldredge and myself, and I have underlined in the chart all of the things which are taken from or which are contained in the stipulation.

Mr. Wykes: The stipulation is to govern, and there is nothing intended to be in the chart that is not in, and a part of, the stipulation.

1326 On June 25, 1914.

ROLLAND C. ALLEN, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I have been employed for five years as State Geologist of Michigan. Previously was instructor in Geology in University of Michigan, one year; was connected with Michigan State Geological Department for a short time, before appointment as State Geologist. I was a year ago last January appointed by the State Tax Commissioners as appraiser of Michigan mines. Since, I have made two complete ap-

praisals of the iron mines and one of the coal mines in Michigan. It was necessary for me to locate the ore formation and ore bodies in the Upper Peninsula.

As expert for Tax Commission, the records which come to my office are variable in character. Each mining company, operator or owner of an iron mine, is required to submit to the Board of State Tax Commissioners maps showing all of their underground workings—records of their drillings and other explorations. This is used by me in appraising these properties for taxation. In addition, I use a vast fund of other information, accumulated by geologists for many years in the mining regions.

The ore formations in Upper Peninsula are indicated by the geological surveys of the Federal Government and of Michigan, and by the work of individual geologists. In certain localities, the information regarding the existence of iron ore in formations is so precise and complete that we can make definite statements regarding its presence or absence, but for a large part of the area known to be underlaid by ore bearing formation we are unable to state definitely the
1327 presence or absence of commercial iron ore. The presence of a known ore bearing formation indicates possibility of occurrence of commercial bodies of ore, until exploration and geologic research proves the contrary.

The reports submitted to me contain records of the drillings and explorations made by mining companies in the iron ore district around Ishpeming and Negaunee. These reports are verified, on oath of the makers, and by personal examinations of myself and assistants where possible.

I am familiar with the line of the South Shore as it leaves Marquette, runs westerly through Ishpeming, Negaunee, Champion and Michigamme. I know the location of the line and the sections and subdivisions crossed.

This (Defts.' Ex. 73, Allen) is a map of the D.S.S.&A. in two parts, the first part from mile post 163 to mile post 173 and the second part from mile post 178 to mile post 198. This map shows not only location of main lines of D. S. S. & A., but also the geology of the adjacent country on either side of the track, and particularly the area underlain by the iron bearing formations of the Marquette Range, and in that formation the location of known bodies of ore, and the location of drill holes which have penetrated iron ore, showing the depth at which iron ore was penetrated and its thickness in each hole which encountered iron ore. It does not show drillings where no ore was encountered, except such as are immediately adjacent to D. S. S. & A. tracks. The holes which penetrated ore are indicated by red circles, and thickness of ore by red figures. Other figures in
1328 black show depths at which iron ore is encountered. The known ore bodies are enclosed on the map, in dashed red lines, inside which is shown the position, depth and areas of the bottom working levels of mines operating. I have omitted from the map ore bodies a considerable distance from plaintiff's tracks.

The only known ore under main line tracks of plaintiff's on the Marquette Range is that of the Cliff shaft mine, crossed by the road near mile post 170, in Negaunee. In making my map, I excluded

those lines engaged exclusively in ore business, and confined myself to main lines used in passenger business. The ore body adjacent to mile post 170 has been, and is now being, worked under plaintiff's tracks. From Marquette to mile post 165, plaintiff's right of way crosses rocks in which there are no known possibilities for the occurrence of iron ore.

At mile post 165, the road encounters the iron bearing formation, and to mile post 169¼, except for a very short distance, in sections 6 and 1, it runs across ore bearing formation. From mile post 169¼ west to mile post 172, the main line crosses Goodrich quartzite formation. This quartzite overlies the Negaunee iron bearing formation and the workings of the Cliff shaft, Lake Superior hard ore, and Section 16 mines, adjacent to the tracks, have penetrated this quartzite into the ore bearing or Negaunee formation below.

From mile post 165 to near mile post 166, the right of way is coincident with the crest of an anticline or arch in the Negaunee ore bearing formation. Such situations are in the Marquette range unfavorable to the occurrence of ore. I recall no occurrence of a commercial body of ore in such a situation on this range.
1329 Therefore, we must conclude that, while the occurrence of ore under the right of way, mile post 165 to near mile post 166, is possible, the possibility is remote and not such as to lend any considerable value to the acreage of the right of way. As illustrating the position of the right of way, mile post 165 to mile post 166, with reference to the geologic structure in the iron bearing formation, the occurrence of the ore bodies in the synclines and the absence of them on the tops or crests of the arches or anticlines, I have drawn a cross-section along the line C, D which it appended to the map. That cross-section is approximately a mile and indicates a general law governing occurrences of ore bodies in the Marquette district. It is: Ore bodies in the Marquette district, speaking now of the soft ores which occur in this immediate vicinity—soft ore bodes show, by the known facts of their occurrence, a decided preference for synclines and almost a complete avoidance of anticlines or arches.

The ore bodies in the Marquette district occur in rock, known as the ore bearing formation, which in the Marquette district varies from a few hundred feet up to 1,400 feet in thickness. A composite analysis of the entire formation would show a content of iron of not less than 25%. Commercial ore must, under present conditions, average above 49% with the exception of certain siliceous grades, of which comparatively small tonnages are mined and used to mix with higher grades. If commercial ore must contain at least 49% iron, and the iron bearing formation as a whole contains on the average only 25% iron, it is apparent that the ore bodies are the richer parts of the iron bearing formation; these ore bodies were not
1330 present in the unaltered iron formation through which the iron was more evenly distributed.

The iron bearing formation, as originally deposited, differed in many ways from is present condition. The important differences are: The iron bearing formation in original form was a rock con-

taining iron and silica, with subordinate amounts of alumina, lime, magnesia, etc. The iron was in ferrous condition; i. e., the proportion of oxygen to iron in the ferrous condition is less than in the ferric condition. This rock, containing the above constitutents with the iron in ferrous condition, is the original or unaltered iron formation. Any chemical change in the constitution of this rock or its component minerals is a chemical alteration of the iron formation which has been a large factor in the concentration of ore bodies.

The iron formation at present is partly altered and partly unaltered. The unaltered parts of the iron formation are, in that part of the formation which is open to inspection, very subordinate to the altered parts, but in those isolated places where the natural conditions are such that alteration takes place with extreme difficulty or slowness, the iron formation is in an unaltered or relatively unaltered condition. The formation *or* ore bodies is a process of alteration, and represents one of the extreme phases of alteration through the action of underground waters, which operate to dissolve silica and oxidize the iron content of the formation from the ferrous to the ferric condition. Underground waters are the only known agents competent to affect, on a large scale, solution of silica and oxidation of iron. As this phase of alteration is accomplished by underground waters, it is a certain inference that the alteration will proceed most rapidly and to best effect in those parts
1331 of the iron formation where the underground waters flow most freely or are concentrated in underground trunk channels of circulation.

Any geologic structure, therefore, which forms a natural trough with an impervious bottom, becomes a channel of underground water circulation. The synclines form, with their bottoms of slate or other impervious rocks, natural trunk channels or underground water circulation, and it is in these situations that the soft ore bodies are formed. These synclines exist by reason of the deformation by folding or compression, by mountain building forces, of the iron formation, and its associated upper and lower sedimentary formations. Following this deformation, the country has been reduced by erosion, so there are today exposed the stumps of ancient mountains, and the plane of erosion or surface of the ground today cuts across, indifferently, anticlines and synclines; so that these structures, which were once complete, are now cut across or sectioned by the plane of erosion, which is the ground's surface.

The above applies to the concentration of the soft ores of the Marquette range, and not to the hard ore bodies which occur in the top of the formation and characteristically just under or near contact with the overlying Goodrich quartzite.

Figuratively speaking, the right of way in the vicinity of mile post 166 descends from the crest of the anticline, or arch, and cuts obliquely across the axis of the great Maas-Negaunee syncline or basin. The axis of the syncline may be taken as the central or median line, or a line coincident with the lowest point of the trough, running lengthwise of the syncline.

1332 In my opinion, the Maas-Negaunee trough or basin contains one of the greatest ore reserves in Michigan. The working of the Maas and Negaunee mines, and the numerous drill holes

west of these workings, or down the pitch of the trough, show that in all probability there is an almost, if not quite, continuous body of iron ore occupying all or nearly all of that part of the ore basin enclosed by the red dashed line on the map, which lies east of Healey Ave., in Negaunee. To my knowledge, there are no drill holes in this basin which penetrate ore at depth, west of Brown Ave., in Negaunee, until we reach the S. E. ¼ of N. E. ¼ of section 1, where, near the east central side of this description, ore occurs between 2,100 and 2,205 feet, and near the western side, and about 300 feet south of the former, ore is shown by a drill hole between the depths of 2,784 and 2,990 feet, and below.

Examination of the workings of the Maas and Negaunee mines, and of the records of drill holes in the Maas-Negaunee basin, shows clearly a westward pitching synclinal trough, which carries ore in the area above referred to, and presumably more or less continuously farther west across section 6 and into section 1. This trough is crossed obliquely by the D. S. S. & A. from near mile post 165 to about mile post 167½. No ore is known to exist in this trough under the right of way. It is my opinion that ore does exist under the right of way in some places and possibly for a considerable part of the entire distance The depth of this possible ore, as indicated by drilling and by the known structure of the Maas-Negaunee basin, will be from 600 feet, near mile post 166, gradually deepening to the west under the track, until in section 1, near a point 1,320 feet east of the center of the section, it becomes probably nowhere less than 2,000 feet,
1333 and probably 2,700 or 3,000 feet, in depth. It is possible that small bodies of ore may occur anywhere in the Negaunee formation within the limits of the Maas-Negaunee trough, but the great body of ore has been demonstrated to be in the bottom of the ore bearing formation or trough.

It is difficult, if not impossible, to mine a large body of soft iron ore, particularly if above (less than) twelve to fifteen hundred feet, without material disturbance of the surface of the ground by caving. As the thickness of rock above the ore body increases, the disturbance of the surface, as a result of caving at great depths, becomes progressively less, as the breaking up of great thickness of cap rock creates an enormous number of small voids which operate to swell the volume of the caved rock; so a large cavity at great depth may be filled by caving and breaking of the overlying cap rock without material disturbance of the surface.

Applying this to the question of what would happen to the D. S. S. & A. railroad were ore to be mined beneath it and the void permitted to fill by breaking and caving of the rock above it, it may be said that ore lying at great depth (2,000 feet or more) could be mined and the ground above permitted to cave without material disturbance of the surface; such disturbance or sinking of roadbed could easily be counterbalanced by filling as the subsidence progressed. The subsidence would be slow. I make this statement in respect to effect of caving from the knowledge gained from observation of results of caving in many iron mines throughout Michigan.

Beyond section 1, in Negaunee, west to mile post 170, there is to my

knowledge no known commercial ore bodies of any value be-
1334 neath or immediately adjacent to the plaintiff's right of way.

The road crosses underground workings of the Cliff shaft mine in Ishpeming, near mile post 170, and ore occurs under the right of way. The Cleveland Cliffs Iron Co. is mining hard ore at various depths down to 987 feet, under Ishpeming, and are preventing caving or movement, by leaving supporting pillars of approximately 30% of the ore. Such mining wouldn't be possible with the same favorable result in soft ore.

It is probably the fact though not certain, that an ore body extends across the right of way between approximately 10 and 30 rods west from mile post 170, in Ishpeming. This ore body lies at moderate depth, not greater than 250 to 300 feet, beneath the track. In my opinion, this ore can be mined, as in the Cliff shaft mine, without disturbing the surface under or adjacent to the D. S. S. & A.

From about 40 rods west of the Cleveland shaft, mile post 170, west, there are no ore bodies known to lie beneath the main line of D. S. S. & A. There is a reasonable probability that some ore bodies do occur between mile posts 170 and 172, and, if they do, they may, in all reasonable probability be mined without disturbing the surface or caving the right of way of the railroad, as ores in this vicinity, and particularly in the top of the ore bearing formation at or near the contact with overlying quartzite, are hard, and may be mined by the room and pillar method, leaving sufficient ore to support the openings. This need not be over 30% of the ore. The Goodrich quartzite which underlies the right of way, mile post 169¼ to mile post
172, is a very hard, strong rock, capping the underlying ore
1335 bearing formation, thus rendering the supporting of openings in the ore bearing formations much easier than otherwise.

The hard ore is mined to a depth of 987 feet in the Cliff shaft mine, and approximately the same in the hard ore mines in sections 9 and 16.

Mile post 172 to mile post 190, near Michigamme station, the main track of plaintiff is underlain by rocks not known to contain iron ore. Within the Michigamme formation are local lenses or ferruginous rocks, and mining operations have been attempted on some of those ferruginous layers, but with uniform financial failure.

Near mile post 190, the main track crosses, for ⅜ of a mile, the Negaunee iron bearing formation. Also, from mile post 192 to mile post 192¼, and from mile post 194¼ to mile post 197¼, beyond which the track does not cross iron bearing rock. The ore bearing formation, mile post 190 to mile post 198, and beyond, is hard, siliceous and lean. While some ore has been mined at Michigamme and other locations on this belt of Negaunee formation, no mines are at present operating, and I know of no plans for operations on this belt. If commercial ore should be discovered here, it is probable, as in the hard ore area in the vicinity of Ishpeming, that openings could be made under the track for the purpose of extracting such ore without danger of disturbing the tracks.

Approximately parallel with the main track of the railroad, from mile post 188 to beyond mile post 198, and in two parallel belts,

from section 32, town 47 north, 29 west, to the N. E. corner of section
21, town 48 north, 31 west, brings us to the Beaufort mine, a
1336 formation known as the Bijiki schist, which, in certain parts,
is ore bearing, as at the Imperial, Portland and other mines west of Michigamme. The Bijiki schist lies entirely to the south of the D. S. S. & A., from mile post 198 to the vicinity of mile post 188, where the road turns to the southeast and crosses three belts of it; no ore is known to exist in the Bijiki schist in the vicinity of its crossing by the railroad. No ore has ever been mined or is known to occur in commercial quantities in this formation east of mile post 193. That portion of the Bijiki schist known to be ore bearing lies entirely south of the railroad, where mining can have no possible relation to the operation of the D. S. S. & A. So far as I know, there are no iron ore formations under the track west of mile post 198.

The Champion mine lies south of mile post 187. I have shown the position of the 32nd or 1907 foot level on this map, which is the level nearest the main track; at that point it is hard ore formation. Except the Bijiki schist member, which is not the same as mined at the Champion mine, there is no ore bearing formation under the track at that point. The known ore does not extend under the main line track within approximately a half a mile.

The lowest workings in the Champion mine (Ishpeming-Negaunee district) are approximately 2,300 feet. I would correct my statement, that the level shown on Defts.' Ex. 73, Allen, as the 1907 foot level is the working nearest the main line track, as the ore leans; the formation dips very steeply toward the track, and successive lower levels are slightly nearer the track. The lowest level at which mining operations are being carried on in soft ore formation is
1337 about 1,400 feet, in the Hartford or Cambrai mines; the ore in most of these deposits somewhere comes to the rock surface and is followed down.

The pitch or incline of the ore body, when followed down, may carry it beneath one thousand or two thousand feet of rock capping. That would correspond with the pitch of the ore bed, and the pitch of the ore bed may or may nor bear close relation to the inclination of the formation.

There is no probability of ore in every foot of the area described from mile post 166 west to the hard ore formation; if discovered in one place, it would not mean the entire area there was underlain with ore. There is a probability that ore beds would be encountered; it would be impossible to state the dimensions or extent. I could only guess at the percentage of formation where commercial ore could be found.

I hesitate to fix ranges within which the percentage might fall with reasonable certainty, without taking time to make an actual calculation of the area underlain by the ore bearing formation and the area underlain by known ore beds, for the purpose of getting a ratio on which to hazard a guess as to that part of the formation not thoroughly explored. Any statement of percentage—one or thirty—or any range between, would be a guess, in the absence of calculations to ascertain the ratio between the areas of known ore in formation

thoroughly explored and the area known not ore bearing, in the same area. Even there I would be speculating upon the feature of finding ore beds in the unexplored part in the same proportion as found in the explored part.

It is my opinion that, if five per cent of the total area of the iron formation exposed in the Marquette range is found to be un-
1338 derlain by ore after thorough exploration, the condition will meet fully the probabilities as they exist today. I do not think more than five per cent of the area of exposed iron formation in the Marquette range will ever be found to be underlain by iron ore, and my opinion is that the area ultimately found to be underlain by iron ore will be less than five per cent. I base the opinion on this, for one thing: The Mesaba Iron range has been thoroughly explored, by drilling closely spaced holes over a considerable part of its area, with the result that between 7% and 8% of the area of the ore bearing part of the Mesaba range is underlain by iron ore. The Mesaba iron range is a thick, gently southward dipping rock bed about a thousand feet thick, and the ore beds which occur in the exposed part of this formation have their greatest dimensions in a horizontal rather than vertical plane.

If the ore beds on the Mesaba range had their greatest dimensions in a vertical, rather than horizontal, plane, the surface area occupied by ore would be very much less than it is under existing conditions. The Mesaba iron formation contains more ore by volume, according to calculations, than does the ore bearing formation of the Marquette range. A very considerable part of the ore beds in the Marquette range have a large vertical component, and this fact, coupled with calculations, would render extremely reasonable, if not certain, the truth of the inference that the areas underlain by ore on the Marquette range are less in proportion to the total area underlain by iron formation than on the Mesaba range.

The presence of an ore bed a thousand feet down, a quarter of a mile from the track, does not carry with it the inference that
1339 there would be ore adjacent to that under the track, at that depth.

If the drill holes in the S. E. ¼ of N. E. ¼ of section 1, Negaunee, penetrated the same sheet of ore as is now being mined at the Maas and Negaunee mines, a comparison of the depth of the ore, there with that here, gives a measure of the pitch of the Maas-Negaunee trough. Assuming the same pitch as exists between the Maas and Negaunee mines, 450 feet in 650 feet for every 3 feet horizontally, it would dip two feet—approximately 33 degrees. 107 feet greater depth to the 1,200 feet level would take us 161 feet farther west; I mean that a depth of 1,200 feet in the Maas mine should be about 161 feet farther southwest than the present level, 1,093 feet.

To clear up any misapprehension of my meaning: When discussing the conditions known to be favorable for the concentration of bodies of soft ore in the Marquette range, I stated soft ores preferred synclines, and avoided the anticlines, as a general rule. By synclines, I meant any geologic structure which for ore concentration would answer same purpose—in fact, impervious troughs of all kinds.

These may be formed, not only by the folding of the rocks into synclines, but by the intrusion of igneous rocks in the iron formation, so that the point of intersection of the intrusive with a layer in the iron formation, or below it, forms a trough. Similar troughs may be formed by the intrusion of igneous rocks in the irregular masses, and some ore bodies are known to occur on impervious basements of intruded igneous rocks as well as in synclines and impervious troughs formed in other ways.

1340 A drill hole within 250 feet of mile post 166 shows 21 feet of iron ore between depths of 600 and 660 feet. As we proceed west, the ore beds, if found, will be probably at greater depths, increasing, to the west, under the track; in the location of the Maas and Negaunee mines, the trough pitches west.

ALLEN.

Cross-examination.

By Mr. Eldredge:

The two sheets of Defts.' Ex. 73 are separated by a stretch of country—that portion of which I have made no map, about a mile west of the Ishpeming city limits (mile post 172½) to a point two miles east of Clarksburg (mile post 178).

The Negaunee formation and the Negaunee and Maas mine formation are different things. The Negaunee formation is the name of the ore bearing formation of the entire Marquette range, with the exception of the unimportant Bijiki schist. The eastern limit of the Negaunee formation is encountered by D. S. S. & A. at mile post 165.

The iron ore formation in which exploring has been done in Marquette city is a lean siliceous formation of Kewatin age, considered by geologists as unworthy of serious attention as an ore bearing prospect. It is called iron formation in geological literature, as it probably originated by action of the same agents as were instrumental in formation of the richer iron bearing rocks. Similar rocks, containing by analysis not over 3% to 5% iron, or less than the average basic green stone, are likewise called iron formation, though they consist mainly of pure silica.

1341 Marquette city is, according to my knowledge, what is known as a lean, banded, siliceous, metamorphosed jasper. In this kind of rock, the iron is in large part concentrated in thin bands alternating with those of a more purely siliceous character, so that no part of this formation could be mined with profit, or find a sale as iron ore.

The difference in the jasper at Ishpeming and at the Jackson mine at Negaunee, from that described, lies in the much higher degree of metamorphism of the Marquette formation and its lower content of iron; there is a difference in the ages of the two formations, the one at Marquette being the Kewatin age and very much older than the Negaunee ore bearing formation of the Marquette range. In the rock called jasper, as applied to the iron bearing

formation of the Lake Superior region, the iron may or may not be concentrated into bands of iron ore alternating with other bands composed nominally of silica, but the whole rock may contain iron in disseminated form, while nevertheless expressing a tendency for the concentration of the iron in higher degree in some bands than in others. That is as near as I can get to the definition.

In the metamorphism of rocks, there are two principal kinds of changes, one known as katamorphism and another anamorphism. Assuming the formation at Marquette is an iron formation, it does not extend to and meet the Negaunee formation. It does not extend west to the Negaunee formation, as there can be no strategraphic connection and no real connection between rock of Kewatin age and rock of vastly under age, as the Negaunee formation, unless they are brought together by a fault, which in this case is not known to exist; if they were brought together by a fault, they would still be separate and distinct formations.

1342 There are a considerable number of drill holes put down, and considerable exploration, not reported to the Tax Commission. The Negaunee formation extends farther east than shown on Defts.' Ex. 73, but not near the railroad. I left off of may map all ore bodies over a half mile from the railway.

Concentration usually takes place in troughs bottomed by slate, but it may take place elsewhere. In any iron ore formation, such as the Negaunee formation, a merchantable body *or* iron ore could exist, unless the contrary is proved by prior explorations.

The main workings of Maas and Negaunee mines are on the same ore body. They are not a part of the same ore body as the Queen or Regent group, or as the Athens, Lucky Star or Prince of Wales mines.

Considering the extent of the ore formations in corporate limits of Negaunee, I would say that the ore formation had not been fully explored. That territory affords one of the most promising fields for exploration for the discovery of iron ore in Michigan, Minnesota, or Wisconsin.

The two holes I referred to on section 1 are located on Defts.' Ex. 73, Allen; one is almost north of the D. S. S. & A. station, about 800 or 900 feet, and the other, say, 300 feet north and 1,200 feet west. In the one north of the station, they encountered 105 feet of ore below 2,100 feet. In the second hole, they encountered 206 feet of ore below 2,784 feet; the hole stopped in ore. These holes were not revolutionary in the ideas they gave to geologists. I would say they were of importance to mining men, as tending to confirm the ore possibilities in the Negaunee formation.

1343 In broad outline, they were put directly through the hard ore formation, and at great depth struck the soft ore formation. It is a very reasonable inference that they confirm the idea that large portions of Negaunee are probably underlaid with merchantable iron ore. The results of drilling in Negaunee have shown that the soft ore measures in the lower part of the Negaunee formation are rich in ore, in many places deeply buried; great depth is not essential to occurrence of ore in this horizon. As you go west

in this iron ore formation, the ore bodies, if they exist, would be discovered at still greater depth; i. e., that part of the formation more nearly in the center or trough of the fold.

There was no evidence of the character of Negaunee formation at great depth west of these two holes, until they were put down. By folding or in some other way this ore body may be found west not to be so deep and to have changed, to some extent, its direction. Westerly from these holes, the ore will probably be at greater depth, if the formation continues as indicated by those holes, because the entire Marquette range is a great westward pitching syncline, of which the Maas-Negaunee syncline is a minor but component part; the whole thing pitches west.

Without assuming an extension of the Maas-Negaunee ore body in a continuous sheet to the deep holes in question, I would state that the ore in these holes is very much more probable at the same horizon as the Maas-Negaunee ore, and in the same syncline of fold. It is not necessarily a continuation of the Maas-Negaunee ore body, though the ore occurs at the same horizon. By horizon, I mean the ore occupies the same relative position in the Negaunee ore bearing formation, relative to the top and bottom thereof. I do not admit
that there is a continuous sheet of ore from those holes to the
1344 Maas-Negaunee mine. I think it is quite reasonable, and even probable, that that ore is at the same horizon as the ore in the Maas-Negaunee mines. I should consider it a discovery of a new body of ore.

I know the properties on the hill south of the D. S. S. & A. in Negaunee—the Milwaukee, Davis and Lucy. I think the statement fairly within reason that these deep holes justified putting down deep holes all along that ridge, with a fair prospect of discovering bodies of ore. There is an indication that the Lucky Star, Athens trunk extends into the Lucy mining property, as shown on Defts.' Ex. 73, Allen.

I spoke of the probable existence of an ore body of 250 feet depth. The D. S. S. & A. does not cross the ore body, as known, but it is possible that the ore body extends farther southeast beneath the track. It is about a mile west of the New York mine.

I would not go so far as to say that the occurrence of similar ore to that in these two deep holes on section one indicates ore below the Cleveland Cliffs and New York mines as a probability, but admit that it is a distinct possibility. It would be within reason to seek ore at lower levels than worked under the East New York mine and under the Cleveland Cliffs mine; the risk would not be so great as before.

The Negaunee formation extends to a very considerable distance beyond Lake Michigamme on the north limb of the Marquette fold, and on the south limb it extends to beyond the Republic trough; I count the Republic and Champion mines as a part of the Negaunee formation.

If Professor Smythe said D. S. S. & A. generally is on the Negaunee formation as far west as Kenton, that statement is not true in
the strict sense. If Prof. Smythe made that statement, he

1345 undoubtedly meant that for a large part of this distance the track is underlain by the Negaunee formation at enormous depth, but intervening between the track and the Negaunee formation in depth are several thousand feet of other rocks that are above and overlie the Negaunee formation. The Negaunee formation extends beyond Michigamme eight to ten miles and probably further. It is not as well known to geologists as that portion east; there has been no exploration. I judge ore formations by exploration; they may be traced magnetically.

Professor Smythe's statement, as I understood you, was to the effect that in his opinion the D. S. S. & A. was underlain by the Negaunee formation as far as Kenton. Except by inference from geologic structure, assuming the railroad to lie over the formation, Prof. Smythe could know nothing about it if it was at the enormous depth suggested. To qualify all the statements in reference to quotations from Prof. Smythe, it is my opinion he has been incorrectly quoted, or, if not, I misunderstood the matter as put to me.

The principles of geologic science are just as firmly established and just as dependable as those of other sciences. The business of mining, as conducted at present, is based to a very large extent on geologic science; particularly is this true in exploration for iron ore. The greater a man's knowledge of geology, the more intelligently he can advise as to the most likely places to explore; in the average case, he has no certainty that, when he has picked out the most likely place, ore will follow his exploration. There is no general certainty in geological work, when it comes to the actual finding of ore. All of the geologic science that we know now, or may ever expect
1346 to learn or acquire, will never eliminate the element of chance or luck in the mining business.

I am not familiar with the old workings of the Lake Superior Iron Co., at Ishpeming; I am familiar with the system. The custom was to preserve their shafts, and support the ground by leaving pillars. There is an enormous tonnage of ore in the pillars still in the Lake Superior hard ore mine. If it is the object of the company to save the ore, rather than support the surface, they can take the ore out; that is the common practice. Unless the surface is more valuable than the ore, it would be economy to take the ore out. In soft ore mining, filling a void, instead of allowing the ground to come down naturally, adds to the expense. I don't think any mining company would want a main line railroad track, that they had to maintain, to cross one of their ore bodies if they knew they would want to mine under it.

ALLEN.

Redirect examination.

By Mr. Wykes:

When I stated the most easterly limits of the Negaunee formation would be approximately one mile east of mile post 165, I meant that that point was the most easterly point I have shown on Defts.' Ex. 73,

Allen, but, as explained, this is not a complete map of the Negaunee formation.

There are no active mines along the south line, east of Eagle Mills. In the stretch of five to seven miles between the two maps (Defts.' Ex. 73, Allen), the probability of ore is so remote as to add no value to the land under and adjacent to the track.

Ore bodies are of variable thicknesses. The fact that drill hole over a hundred feet in depth stopped in ore is no indication
1347 that the entire ore body surrounding that hole would be of the same thickness. In geology we never assume a distance of over 50 feet around a drill hole. It is fair to say that the conditions in a circle of 50 feet radius would be represented by what you find in a drill hole in the center; beyond that, experience has taught us to make no assumptions, because the uncertainty of the conditions are such that we cannot speculate further than 50 feet on the results of a drill hole in iron ore. There are exceptions to that rule; there are certain areas where it is safe to allow a little bit more than that; there are areas where it is not safe even to assume a distance of 50 feet; sometimes you cut it to 25.

The probabilities are that ore, if found under the New York and Cleveland Cliffs mines, west of the two drillings near the station, meaning the soft ore at the base of the Negaunee formation, would be as deep as that shown by the holes in section one. The information we have leads to that inference, but in this the inference that ore will be found is not very trustworthy; that is at a lower point in the pitch that begins up at the Maas and Negaunee mines and extends westward. If it were in the same pitch, and if the pitch remained the same as indicated in the drillings in Negaunee city, the soft ore bearing horizon would be at depths almost, if not quite, beyond the reach of the drill.

I stated the dip changed and took a more horizontal turn, and it is not probable that the base of the Negaunee formation in these localities which we are considering is beyond the reach of the drill; i. e., I do not think that this rate of pitch continues for that distance, as we have evidence that it has already flattened out, but no trust is to be placed in any such reasoning, as a practical matter, because the elements in the problem are so elusive that there is no way of
1348 getting hold of them; we cannot make any definite calculations, and, if you did make an arithmetical calculation of that pitch, it would have no value from the standpoint of prospect.

The elements in the problem which make the presence of ore in places unexplored, and places 50 feet around from present drill holes or workings indefinite, have something to do with the fact that I did not add a value for assessment purposes to the lands which had not been explored and which were the distance stated from explorations. As a fact, the mineral values on properties to which we now refer, namely, the New York and the East New York, were placed at $12.50 an acre. They have no working mines on them; ore had been mined there in past years. All through the Negaunee basin, I followed the same rule, and included nothing for ore where I did not know of the presence of ore, or where I could not reasonably determine its exist-

ence. That was due to the uncertainty of finding ore or of knowing its quantity or extent, except where I had some previous exploration, or knowledge from exploration or workings. In other words, the values in property of that kind are purely speculative, and, while those speculative values may be sold, and there is a market for them, there is no way of ascertaining that market; the properties have no known intrinsic value, from an ore bearing standpoint, until ore is actually found. When we consider that probably not over five per cent of the entire area of iron formation would ever be proven to be underlain by iron ore, that course of reason is amply justified, because, if we assessed all of these properties which are not known to contain ore at high figures, it would result that we were taxing 95 acres out of a hundred at much above their value, though the other five per cent might be so valuable as to overwhelm these low valuations.

1349 I do not mean to alter in any particular my statement that excavations of ore in reasonable and ordinary quantities found in this district at distances below the surface of 1,200 feet or over would not disturb the surface materially, and whatever subsidence there was would be so gradual that it could be taken care of by filling from the surface.

1350 On July 14, 1914.

CHARLES A. LINDSAY, a witness called by plaintiff.

Direct examination.

By Mr. Eldredge:

I am 49 years of age, and live at Albany, New York. I am Division Engineer of the Mohawk Division of the N. Y. C. & H. R. R. R. Co. I was educated at the University of Pennsylvania, graduated as A. B. in 1884, and took a post graduate course in 1885, which gave me the degree of Civil Engineer.

After leaving college, I worked about four months with Underwriter's Association, Philadelphia, as a surveyor of fire risks, and then went to the Union Pacific in Nebraska in 1885, on preliminary surveys, location and construction. In July, 1886, I was on the construction of a 25 mile double track railroad, near Cincinnati, for Pennsylvania lines, and stayed there two years. I was then transferred to Pittsburgh, on the location of a branch railroad to coal lines in the Pittsburgh district; shortly after, was transferred to the Maintenance of Way Department of the Pittsburgh, Ft. Wayne & Chicago Railway, at Ft. Wayne, in charge of the engineering in maintenance of way on the Pittsburgh, Ft. Wayne & Chicago Railway, west of Crestline, including Chicago terminal. I was there until the spring of 1890, when transferred to Cincinnati, as Division Engineer of the Cincinnati Division of the Panhandle lines of Pennsylvania, from Cincinnati to Columbus, with branches from Xenia and intermediate points east of Springfield, Ohio, and west to Richmond, Indiana.

I stayed there until 1898, when I took service with the Southern

Railway, being Division Engineer on its Washington Division, to Lynchburg, with a fifty mile branch from Alexandria west
1351 into the Blue Ridge Mountains, and a 120 mile branch from Manassas, Va., to the Blue Ridge Mountains, through the Front Royal Gap. I stayed there until 1901, when I took service with the Pennsylvania Division of the New York Central lines, located at Jersey Shore, Pennsylvania. This division consisted of the Fallbrook Railroad, from Jersey Shore and Williamsport north to the connection with the main lines at Lyons and Geneva, and west into the coal regions of Pennsylvania. The Beech Creek Railroad has many branches in the coal regions, and while there I laid the track and ballasted it, and finished it, ready for service, on 28 miles from Clearfield east, down the Susquehanna River Valley, to Keating, on the Pennsylvania, over which our company acquired traffic rights to Jersey Shore, so between the Jersey Shore and coal regions we had a low grade line favoring the heavy coal traffic, reserving the Beech Creek line for the return of the empty cars on heavy grades.

I was transferred from the Pennsylvania Division of the New York Central to the Mohawk, in 1902; was there until 1907, when I was transferred to the electric zone of the New York Central, 57th St. north, for a year and a half, and then returned to the Mohawk Division at Albany; have been there since.

While in charge of the Mohawk Division, up until March, 1910, I had a charge of single track railroad from Herkimer, New York, north, through the Adirondacks, to the Canadian Pacific, south of Montreal, over which we had traffic arrangements into Montreal.

I have been in actual charge of maintenance since 1890; that began on the Panhandle system of the Pennsylvania. In all my subsequent experience, I have been in actual executive charge of maintenance of way.

1352 I have given special study to railway operation, its effect on track, roadbed and track structure, bridges, trestles, and other structures, the cost of operation, and the amount and causes of expenses incurred in the different kinds of business conducted by railways.

I examined complainant's railway, arriving on its line July 10, 1914, and spending several days going over the line; the purpose of examination was to study the physical characteristics and condition of the property, and its operating and traffic condition, so far as such rapid examination would permit.

I noted the passenger train speed, Houghton to Marquette, it being slightly over 40 miles per hour between stations, and at times obtained a speed of 52 miles per hour. I studied the train schedules from the official employees' time table.

I had never been in this region before; I confirmed my previous impression that the ore industry was concentrated in a very small area. I noted the arrangements with other railroads, by which their trains were operated over the tracks of this company; I observed the traffic conditions, and that there was a denser traffic on certain portions of the line than on others. I figured the railroad might be divided into 5 zones, on which the traffic density varied greatly.

These zones, in the order of relative importance as to traffic density were: (1) Winthrop Jct. to South Marquette, (2) Winthrop Jct. to Nestoria, (3) Nestoria to Houghton, (4) South Marquette to Eastern terminal, and (5) Nestoria to west state line.

I asked and obtained the number of passenger and freight trains passing typical stations in each zone on a typical day in each month of a given year; from a study of the figures, I confirmed my
1353 opinion that I have selected the zones properly, and that the conditions I have described are those that existed.

I asked and received information as to the character of the tonnage, and was furnished a copy of the annual report of the South Shore to stockholders for fiscal year June 30, 1912. In this report I found, on page 11, a statement of commodities handled for years ending June 30, 1912, and June 30, 1911, in tons and per cents of total tonnage; this gave, ore 42.8% in 1912 and 41.42% in 1911, and lumber and other forest products 24.22% in 1912 and 23.82% in 1911.

The South Shore lines, with respect to physical characteristics, can be divided into two parts, that west of Marquette being very crooked, with severe gradients, that east of Marquette, being comparatively straight, with relatively easier gradients.

The railroad, Nestoria west, was laid with light rail, and the alignment and grade conditions were quite severe. Track conditions on that part were not as good as on any other part of the line. The line, Nestoria to Houghton, involves very crooked alignment, and some of the heaviest of grades. Nestoria to Marquette, the grade and curve conditions are not quite so severe as Nestoria to Houghton. The track, Houghton to Marquette, is well constructed and maintained; Marquette to eastern terminal, it is in good condition, well constructed and maintained, and of the highest degree of excellence of any track in the territory, and on it train operation could be maintained at the highest speed. The bridges, trestles and culverts, so far as I could observe, were maintained in a high degree of excellence.

The locomotives are not of excessive weight for the track conditions and speed made, and the passenger equipment is of a higher degree of excellence than would be found on most roads similarly situated, and in fact better than the equipment of other lines
1354 into this territory; the freight equipment, I judge, is in keeping with the lines of other railroads. In passing over the road, I had with me Complt.'s Ex. 2, Riggs, and followed the alignment, grade, rail and ballast conditions.

From observation of traffic conditions and study of time tables, I realized that with mixed freight and passenger traffic it would be necessary to superelevate the curves. I observed the principal curves and the superelevation, though I made no measurements except by the eye. I feel I am thoroughly competent to estimate from the action of trains passing over the curve. I found the elevations uniform around the various curves, the degrees of which I noted on Complt.'s Ex. 2, Riggs, and found them sufficient for the speed of the train I was riding on, and not too high for lesser speeds. I saw

no curve with 8 inch elevation, and I believe, had there been such, I would have seen it.

I observed the passenger trains and service, and studied their schedules, and was impressed with the fact that, for a road passing through a territory as sparsely settled, the extent, amount and general character of the passenger service was much above that which the country would support or warrant. I do not think it better than it ought to be; it might be improved in certain instances.

The only refinements of track and track maintenance, for any particular traffic, that I noticed was that I felt the curves were maintained to a higher degree of excellence, generally speaking, than the tangents; this condition was evident to me to be a tribute to the comfort, convenience and safety of the passenger traffic.

As to whether the road was maintained in a way necessary for comfort of passengers, but not necessary for freight service, I believe

1355 the distribution of ballast, generally speaking, was greater particularly east of Marquette, where swamp conditions exist; that was due to the fact that the high speed of passenger service necessitated better and more copious ballasting, for safety, comfort and convenience. There is nothing peculiar about this line in respect to the bridges, in that bridges must be designed, constructed and maintained for the highest class and fastest trains to be operated over them.

Limiting my answer to ballast, ties, rails, other track material, roadway and track, bridges, trestles and culverts, undergrade crossings, and grade crossings, the track must be maintained for the faster passenger trains; there is always provided a margin of safety meaning that, if designed for a speed of 50 miles, a train running 60 miles an hour would still be safe. The destructive elements of traffic on track, in the order of importance, in my opinion, are speed, excess strain due to locomotive, and the weight of equipment and loading behind locomotive.

The effect of speed on track follows the fundamental law of physics; i. e., that the blow resulting from a moving object varies with the mass, directly, and with the square of the speed.

The locomotive constitutes a very heavy mass on a short stretch of track—a concentrated loading. The axle loads of locomotives are usually much greater than those of cars. The springs must be more rigid than those of passenger cars. In consequence, the action of the locomotive on track is of the entire mass acting as a unit, and not of the individual wheels, as with a car.

Weight of equipment and loading has its effect, though I am not sure it follows the law of physics, so far as it affects track maintenance, in the direct ratio I have mentioned, as, if we assume the tonnage in zone 1 to be five times that of the line east of Marquette,

1356 we might assume the maintenance expense in zone 1 to be five times that where the traffic was less dense, but from my observation and experience I do not believe that that ratio will follow; therefore, the expense of maintenance does not follow the direct ratio in increase of tonnage, but a less ratio. This would have to be determined by segregating the tonnage expenses of each

zone and comparing each zone separately, which would require bookkeeping. I am not able to form a judgment regarding that.

I would estimate the tonnage in zone 1 to be five times that of the zone to the east, and if the expenses in zone 1 were more than twice those of the other zone, I would be much surprised. On inquiry, I was advised that there was about twice the labor and one-third more consumption of ties in zone 1, but that the other expenses did not vary materially from those east of Marquette.

If my method of apportioning expenses of maintenance be correct, it would be necessary to ascertain the total tonnage of passenger service and multiply it by the square of its maximum average speed, and take the tonnage of the freight service and multiply it by the square of its average maximum speed, and from that obtain a ratio. That ratio would disclose that passenger service causes the greatest expense for maintenance, both in destructive wear and on account of higher standard of maintenance for the comfort and convenience of passengers.

Assuming 522,000,000 freight ton miles and freight speeds of 20 miles per hour, and 212,000,000 passenger ton miles and passenger speeds of 40 miles per hour, speed assumptions being based on the time table rule, the ratio becomes 37.4% freight and 62.6% passenger, by applying the formula M. V. squared.

There is a difference in the condition of equipment of the two classes of service, the freight being the more difficult to move in a given way. I think a proper and fair allowance for that element would reduce the ratio to 40% freight and 60% passenger.

1357 In my judgment, taking into consideration only the expenses of maintenance of way and structures named, the passenger traffic and the passenger revenue train mile- are more expensive to produce than the revenue freight train mile.

In zone 1, there is a density of both freight and passenger traffic, closely approximating equality, while on the balance of the line the density of passenger traffic is equal to, if not greater than, the freight density, and moves at speeds of greater excess than the speed of the freight traffic. As a consequence, the burden of maintenance of the long stretches of lean territory, for the safety, comfort, and convenience of the passenger traffic, and the formula just given, distributes the tonnage over the entire line. Eliminating the tonnage and expenses of zone 1, and considering the conditions of zone 4, east of Marquette, I think the facts would prove the ratio to be 70% passenger and 30% freight.

In the operation of freight and passenger trains, there are other elements entering into the discussion which in an accurate analysis should be given due consideration, but, relatively speaking, these are of minor importance—in many cases almost trivial as compared with the elements of speed, mass of locomotive and weight of load behind it. Zone 5, Nestoria west, is the lightest line, and, because of worse physical characteristics of country and track, and the traffic conditions, the ratio would be between 60-40 and 70-30.

In arriving at ratio of 60-40, I have allowed 2% or 2.5% on account of the inferiority of freight, as compared with passenger, equipment. I intended to include both wear and weather causes of maintenance of way expenses on those particular items.

Taking into consideration other items of expense that might increase the cost of maintenance, such as trackage used ex-
1358 clusively for one service or the other, the ratio that I would apply to the entire road, excluding allocatable tracks, would be less than 60% passenger and more than 40% freight. An equal division of the expenses between the two classes of service would, I think, make ample allowance on a most conservative basis for the relative cost of the two classes of traffic. In zone 1, the ratio would undoubtedly be reversed, though not directly proportional. On the whole road, without studying each zone separately, I would take 50-50 as a conservative and fair method of estimating the division of expense. I should say that the gross ton mile ratio, as used by Thompson, was not proper for assigning the expenses due to the destructive effect of the traffic, as he gives no value whatever to the element of speed, which is of primary and greatest importance.

In my experience, the maintenance expense of plaintiff's railroad would be considerably less if there were no passenger traffic. It would not have to be kept in as good condition if it had nothing but freight; the difference, roughly, would be 20% to 25% less.

Referring to Thompson's testimony, that the greater wear on rail on curves on South Shore is to be found on the outer rail, and that the wear on that rail is about 20% above than on tangent, and that the wear on inner rail is about 5% above the wear on tangent, in the brief time of my examination, I could not go into such details, and I am unable to state the facts on this railroad. In my experience, the high rail on a curve wears out faster than rail on tangents, and faster than the low rail. I do not believe Mr. Thompson's figures would express the right proportion on any conditions that I have ever seen. Generally, we re-lay the low, as often as the high, rail, though sometimes we allow the low rail to stay in a little longer.

With regard to the testimony of Thompson, to the effect that the following elements cause expenses in freight operation in
1359 addition to the differences in weight.

(*a*) That the car wheels in the freight service are not run with their axles as nearly parallel as the car wheels in the passenger service: I have seen no instances of that kind sufficient to make any material difference in the problem.

(*b*) That freight trucks are inferrior to passenger trucks: I would not concede this, except as they might be maintained in a less perfect state than the passenger trucks. The design of freight car trucks is more rigid and more substantial in many respects, size for size, than passenger car trucks. The springs on a passenger car truck are more numerous, and the passenger truck is of a heavier and better construction. The element of comfort not being necessary in the freight car truck, it is designed to give sufficient elasticity, so that the flow of the rolling load upon the track may be minimized.

(*c*) That freight car wheels are chilled iron instead of steel tired, is true, though the material used is not of itself a detriment.

(*d*) That freight car wheels are eccentric, and not true circles, like passenger car wheels: In my opinion, there are as many eccentric passenger car wheels as freight car wheels, and as many eccentric locomotive tires on passenger as on freight locomotives, and the influence of an eccentric wheel on high speed is greater than at low

speed. This element would not be material on freight equipment, but would be material on passenger equipment, and necessitate the turning of tires more frequently to avoid accident.

(*e*) That irregular freight car wheels are more apt to freeze in the brakes or slide on the tracks: Not being able to concede a great amount of irregular freight car wheels, I cannot agree with the balance of the conclusion.

1360 (*f*) That the springs under freight cars are primitive, and inferior to those in passenger cars: While the average age of freight cars might be greater, with more freight cars of the lower type, I would not consider that this was of any great moment, or would introduce any considerable factor.

(*g*) That freight trucks do not turn as readily on their centers as passenger trucks, and do not have roller side bearings, like passenger cars: It is true that the freight trucks do not turn as readily as the passenger trucks, because of the greater concentrated loads. The roller side bearing is comparatively recent, and has been applied to a large number of freight cars; there are as many freight cars in the country with roller side bearings as passenger cars. Ordinarily, the load is supposed to rest but lightly on the side bearings, and the element of resistance to curving, and consequent element of additional wear to track, seems to me to be too remote to be able to give an appreciable value of itself, though I admit that it does have substantial bearing in the general study of the problem, and that the irregularity of freight car wheels is an appreciable item of cost. The general condition of freight car wheels is less perfect than of passenger car wheels, but it does not introduce a tangible element of cost; the gross value of all these irregularities is of minor importance as compared to the elements of speed, weight, and engine effect.

Thompson's Ratio 1, of gross ton miles, is not, in my opinion, proper for division of wear cost, because it gives value only to the question of weight; it gives no value to the speed, which is of primary importance, or to the element introduced by the locomotive. In my formula, producing a ratio of 60-40, I took the ton mileage as given

1361 me, and did not give value to the locomotive; had I done so, the passenger figures would have been higher, and the freight lower.

The only difference in the excess strain of a locomotive between the freight and passenger is that affected by the difference in weight, length of wheel base, number of axles, load per axle, and the general condition of wear, and to some extent by the action of the locomotive working hard. The stress would be nearly the same in each class of service.

In my opinion, weather stress is the most destructive agent of ballast, generally, though I cannot state as to South Shore. The next is the work in tamping, surfacing and lining track, mostly necessitated by the passenger service. The joints, due to the elements and the passage of trains, become low; the ordinary low joint is unobjectionable in freight service, but very objectionable in high speed passenger service, and a large part of the labor in maintaining tracks is to line and surface them to keep proper condition for the comfort and convenience of the passengers.

The ballast also is destroyed by disintegration, due to the absorption of moisture, or by frost—the action of frost. The St. Ignace ballast is limestone, which depreciates. I broke open two or three of those stones, just out of curiosity, to see whether that was rounded pebbles of that same formation, and I am of the opinion that it is, and it is a very soft limestone, most of the pebbles of the St. Ignace gravel, and will depreciate by exposure and by erosion and so on, and by crushing under the action of tools in working on it.

It is not proper to divide maintenance cost of ballast on gross ton mile basis because a perceptibly larger amount of work is done on account of the high speed passenger trains, and by frequent renewals to keep the track in condition for high speed trains. I should
1362 say it would be proper to divide ballast expenses 60% passenger and 40% freight.

While I cannot speak with accuracy, because I have not the statistics or facts, from my observation the road uses a large percentage of tamarack and hemlock ties and a small percentage of cedar; cedar ties are destroyed by mechanical wear, while over 85% of hemlock fail and are renewed because of decay. It is my practice to renew the ties more frequently when there are passenger trains, as a tie in freight track can safely be left much longer than if the track is used by passenger trains. The extra length of time depends entirely upon the passenger traffic, conditions and speed. If the speed of the passenger were very much higher than that of the freight train, we would take the ties out sooner, and throw away some of the useful life; in my judgment, the gross ton mile ratio is not proper to divide expenses of repairs or renewals of ties, because mere weight does not destroy the tie. I would divide on the basis of 60% passenger and 40% freight, except that in zone 1 it might be necessary to transpose the ratio. (Witness produced table showing movement of trains in the several zones.) Typical stations were selected to give a fair measure of the train density by zones. The table is as follows:

(Here follows tabular statement marked page 1363.)

Statement Sho

Station.	(a)	July 15, 1911. Pass.	Frt.	Aug. 15, 1911. Pass.	Frt.	Sept. 15, 1 Pass.	F
Eagle Mills	1	14	34	14	26	14	2
Humboldt	2	10	9	10	18	10	1
Michigamme	2	12	12	12	10	12	1
Nestoria	2	12	9	12	8	12	
L'Anse	3	8	4	8	6	8	
Chassell	3	8	4	8	4	8	
Brimley	4	6	7	6	4	6	
Trout Lake	4	4	8	4	6	4	
Newberry	4	4	6	4	5	4	
Kenton	5	4	4	4	4	4	
Lake Gogebic	3	4	5	4	4	4	

(a) These figures refer to the zones and in the order of their relative traffic

Showing Number of Trains per Day Passing Stations on D., S. S. & A. Ry. in Michigan During Fiscal Year Ending June 30, 1912.

15, 1911.		Oct. 15, 1911.		Nov. 15, 1911.		Dec. 15, 1911.		Jan. 15, 1912.		Feb. 15, 1912.		Mar. 15, 1912.		Apr. 15, 1912.		May 15, 1912.		June 15, 1912.		Total.	
s.	Frt.	Pass.	Frt.	Pass.	Frt.	Pass.	Frt.	Pass.	Frt.	Pass.	Frt.	Pass.	Frt.	Pass.	Frt.	Pass.	Frt.	Pass.	Frt.	Pass.	Frt.
	26	14	26	14	17	14	14	16	7	14	9	14	10	14	6	14	22	14	27	170	224
	12	10	20	10	8	10	6	12	9	10	11	10	6	10	8	10	12	10	12	122	131
	10	12	8	14	8	12	8	12	9	12	11	12	8	12	8	12	8	12	10	146	110
	8	12	7	10	8	12	10	14	9	12	11	12	8	12	8	12	8	12	8	144	102
	6	8	4	6	4	8	4	10	4	8	5	8	4	8	4	8	4	8	6	96	55
	7	8	4	6	4	8	4	10	5	8	6	8	6	8	4	8	4	8	4	96	56
	4	6	4	6	4	6	4	6	5	6	4	6	4	6	5	6	4	6	4	72	53
	9	4	6	4	4	4	7	4	4	4	6	4	9	4	6	4	6	4	6	48	77
	5	4	4	4	4	4	6	4	2	4	4	4	4	4	4	4	4	4	4	48	52
	4	4	4	4	4	4	6	4	4	4	8	4	7	4	4	4	2	4	6	48	57
	4	4	4	4	4	4	6	4	4	4	8	4	6	4	4	4	2	4	4	48	55

raffic density, No. 1 being densest.

1364 I do not concede the propriety of dividing rails and other track material on Thompson's gross ton mile ratio. Rail renewals are necessitated by wear, distortion and inadequacy; rails are renewed principally on account of the high speed traffic. That ratio is not proper to be applied to the division of the common expenses for ballast, ties, rails and other track material.

As it would be unsafe to operate passenger trains at their normal speeds without the expenditure of money, money must be expended as much for one passenger as for a thousand. When I speak of the difference, I have in mind the safety, comfort and convenience of the passengers.

In my judgment, Thompson's time ratio, 4, is not a proper ratio for the division of the items of expense for maintenance of way and structures due to depreciation, weather stress, decay or erosion, as the expense should be divided in the inverse ration of the time occupied, because of the greater importance of the safety and regularity of the passenger service. The cost should follow the service, and cost of maintenance is due to speed.

Thompson's time ratio is not proper or accurate to divide common expenses as to care of roadbed, general cleaning, patrolling and watching, bank protection, filling and other expenses, for the reasons just stated, and the patrolling and watching, bank protection, and expenses of that kind, are primarily incident to the passenger service.

Thompson's time ratio does not properly, or with approximate accuracy, divide the common expenses as to the removal of snow, sand and ice, the maintenance of bridges, trestles, culverts, grade crossings, fences, signals, interlocking plants, snow and sand fences and snow sheds, telephone and telegraph lines, etc.

1365 I do not consider either the gross ton mile or time or revenue train mile ratio as an entirely theoretically proper one, but, based on my calculations, the revenue train mile is the one that gives the more accurate result, because of the manner in which the speed and the importance of the passenger service and the engine element are ignored in the Thompson method.

In my opinion, neither the gross ton mile ratio or the time ratio of Thompson would properly divide the unallocatable property used in common by freight and passenger traffic. The reasons given as to division of operating expenses on these bases apply equally here. To divide the common property on the same basis on which common expenses are divided, as indicating use, would be a fairer measure than either of the two methods outlined by Thompson.

The side motion of a freight train at slow speed causes a strain on track when the engine is laboring hard. As compared to the gross effect from all causes of either class of service, it is trivial, because, when the engine is working in such manner, the cars are doing their least damage, as they are moving at slow speed, probably up grade, and hanging away from the engine; they are not doing the damage to track that they would if the whole train were moving as a unit. Passenger engines also work hard going up grades, and do more damage when doing so than a freight train; the damage is

more nearly proportional to the square of the speed, and the equipment behind a passenger engine always acts as a unit, as it is close-coupled, and there is not the slack that there is in a freight train. The blow of a locomotive has everywhere much greater destructive effect due to the greater mass.

Referring to Thompson's alphabetical list of 28 elements weighting the cost of freight service and making the revenue freight train mile cost more than the passenger train mile, while I concede that some of the items weight the freight side of the problem, I do not wish to admit that they make——

[Folio 1366 missing.—Printer.]

1367 consequential, and there are many offsetting instances, such as the carrying in freight trains of company material used in maintenance of common tracks.

(*k*) The hauling of business and private cars by passenger trains may weight the freight side, but must be infinitesimal.

(*l*) The sustaining, through passenger expenses, of the sleeping and dining car service is an integral part of the service, and a source of advertising, and must be considered a part of the passenger service; it does not weight the freight side.

(*m*) The exclusive use by freight traffic of large amounts of mileage of line, side tracks and spurs may weight the freight side. This mileage and its cost of maintenance is relatively small, and much can be allocated.

(*n*) The greater use of yards and terminals by freight traffic in switching does weight the freight side, if it is a fact; it would vary closely with the density of traffic.

(*o*) Double and triple tracking for the needs of freight service may weight the freight side, but will be due to traffic density. I saw, and believe there is, no such condition on this line.

(*p*) The use of main tracks by freight service in switching in greater proportion than in passenger service may weight the freight side, but will be trivial.

(*q*) The more frequent starting and stopping of freight trains in switching may weight the freight side, but is not a general fact, and would be infinites-mal.

(*r*) Switching by road locomotives, not represented by road train mileage or appearing in switching records for first hour, does weight the freight side, dependent on accounting methods; it must be trivial.

1368 (*u*) Greater length of passing track, to accomodate longer freight trains, does not weight the freight side; freight trains take sidetrack to avoid delay to passenger trains, and fact that track may also be used to pass freight trains ought not to give this feature undue weight.

(*v*, *w*, *x*) These do weight the freight side, but are trivial.

(*y*) The higher center of gravity of ore cars does not weight the freight side.

(*z*) Stational cost of freight movement, as freight cars are moved

superfluously in switching freight cars, may be added to the freight side, but, if so, is infinites-mal.

(*aa*) The greater damage to track and equipment by greater number of flat spots on freight car wheels does not weight the freight side.

(*bb*) Greater injury to tracks due to reciprocating motion of engine sideways, because of alternately applying the power, the element of injury varying with the tractive force of the engine, being greater at slow than at high speeds, I cannot concede always adds weight to the freight side; it may in cases, but when the freight engine is working hard, the car effect is reduced to the minimum, offsetting in some degree the other; the train behind it is not acting as a mass, but is pulling the cars, and the engine alone damages the track. In passenger at high speed the engine also works hard, and has greater effect than a low speed engine working hard. Generally speaking, the sideway motion of the slow speed freight engine is of slight importance in track damage, and ought not to be given much. weight. The engine works so in starting and in climbing heavy grades, and the action reduces rapidly as the speed increases, and the effect on track also reduces rapidly.

1369 The items which throughout this case are claimed to weight and add to the cost of the passenger train mile were listed for witness by counsel as follows:

(*a*) Higher speed of passenger trains, requiring track elevations on curves and other adjustments.

(*b*) Greater expense to insure comfort, safety and convenience of passengers.

(*c*) Removal of snow to keep the road open during storms.

(*d*) Preference given to passenger traffic, delaying freight trains and increasing expenses of their operation.

(*e*) That, of the unallocatable items of expense, 18.6% consist of transportation expense, of which 59% is items that have a direct relation to train movement, and a greater proportion being claimed to be incurred on account of moving passenger trains, because of the necessity of giving them the right of way, and

(*f*) That more superintendence is required by and given to passenger trains than freight, because of the greater risk and higher speed.

After the statement the witness was asked: "What are your views with reference to this statement?"

Generally, I would say that I know nothing of how these expenses are allocated, but all of these items which you have mentioned have a bearing on the subject. I think probably that would be sufficient. With the exception of the damage to the freight equipment, they are all of considerable importance.

The items which Thompson says weight the freight side of the problem are relatively trivial. The causes of depreciation are the destructive effect of traffic, decay, exposure to the elements, obsolescence and inadequacy.

1370 In answer to Thompson's statement, that the dynamic augment does not pass the elastic limit of the track structure until

speeds of 30 or 40 miles were reached, I do not understand entirely what he means, but the statement is unwarranted by either theory or experience; it gives the idea that the elastic limit is passed at speeds of over 30 or 40 miles per hour. Elastic limit is the point at which a body under stress begins to change its shape; having passed the elastic limit, it does not return to its original form, but has acquired a permanent set. If the stress continues further beyond the elastic limit, fracture results; if the stresses in track approach anywhere near the elastic limit, there is danger.

The statement of Woodlock, from Vol. I, page 427, Wis. Railroad Com. Report, Buell case, that the part of cost of maintenance depending on traffic should be divided between the different departments of the service on the basis of locomotive mileage, switching included, in that the locomotive mileage alone is responsible for at least one-half the wear and tear of track because of the elimination of the question of speed. At high speeds, the locomotive ratio would be higher than at low speeds; it would be as the square of the speed. I cannot conceive of any speed at which a freight locomotive alone should be charged with one-half of the cost of replacing the wear and tear of the track.

Mr. Woodlock states that the locomotive mileage alone is responsible for at least one-half of the wear and tear of track; that includes passenger as well as freight locomotive mileage. Assuming he means destructive action of the traffic by wear and tear, I would be more inclined to agree with him that his ratio is nearly right; he may include his wear and tear of replacement, no matter to what cause.

1371 LINDSAY.

Cross-examination.

By Mr. Wykes:

(Witness spent two days going over South Shore line, largely on moving trains.) I observed the character of the country, and of the track structure, the conditions of rails, ties, curves, ballast, rail joints, appurtenant property, curve elevations, traffic and business conditions, and the character and volume of freight and passenger business, and its density on different portions of the line. I asked no questions on the trip, and no information was volunteered, except in one or two minor instances.

I did not find when the ballast or rail was put on the different stretches, except where indicated on Complt.'s Ex. 2. I have nothing to indicate the condition of the property one, two or three years before my examination. I cannot say what was added to the property, or the relative condition of maintenance, in 1913, 1912 or 1911. My answers, as to condition of maintenance, all relate to the time of my inspection, and to no previous time. I have testified in no other rate case, and have never before made anything bearing on a division of costs or laid down principles therefore, except in abstract study of problems connected with general study of track maintenance.

I tried to get the underlying principles on which such allocation might be based. From the time I returned to Marquette to going on the stand, I was engaged in preparing answers to questions submitted to me, which were in general before me in typewriting, as I testified. I had made memoranda of points for answer, and testified from notes. I asked for, and was given, the revenue train mileage, but did not get it for ore service or for different divisions separately. The only information I got on that line was the sheet showing the number of trains passing selected points. I did not get the revenue
1372 train mileage by any subdivision of the road, or by the zones I fixed, and I got no traffic statistics in the passenger or freight service for any divisions, and did not become familiar with any. I saw probably ten D. S. S. & A. passenger trains at passing points on the road; it may have been that I saw the same train more than once. I made no detailed inspection of the locomotives, but saw some of the diagrams, and I inspected examples of those as I saw them passing over the road. I did not learn the relative wheel bases of locomotives in the different services, but studied the diagrams, and got a mental appreciation of the relation of the two classes of engines. I ascertained the ore tonnage was 42% of the total in a certain year, and did not ascertain the revenue train mileage of that business, but I got the impression that, due to short haul, it would be relatively smaller than if it moved over entire division. It might be 12% or 20%.

My method is applicable to zone 1, but I have no way of getting the statistics. The revenue train miles and the maintenance expenses of zone 1 cannot be obtained from the record.

My formula, generally speaking, is M. V. squared. It would not be proper to apply 40 miles per hour in zone 1, because the passenger trains cannot, and must not, run at that speed there. To study the zone as an entirety, you must take all existing conditions—tonnage, speed, traffic density, and everything affecting that zone. In zone 1, where the speed of the passenger and freight trains is more nearly equal, and the freight traffic density is much greater, the freight should bear a very much larger proportion of the expense of maintenance than the passenger, in my opinion. I would still apply my formula, after I found the proper speeds and weights, making
1373 allowance for engine effects. I add the locomotive in, and then add an increment to represent the destructive effect of the locomotive, acting as a mass.

In the five zones into which I divided the road, I made no comparison by percentage of relative density of traffic, but simply went to the point of deciding one was heavier than another, and fixed the order. The passenger business follows practically the same separation, as to traffic density, as the freight. Zone 1, Marquette to Winthrop Jct., is the heaviest, and zone 5, Nestoria to state line, is the lightest, for both passenger and freight traffic. I am judging by the number of trains by selected points. Zone 5, Nestoria west, is of lighter construction and through relatively irregular country, which would increase maintenance cost.

The average weights of rail per mile were, 1913: east of Marquette, 105 tons, Marquette to Houghton, 106 tons, and west of Nestoria, 96.6 tons. There was some re-ballasting going on during my trip, and evidences of general re-ballasting within last 5 years. It becomes necessary to re-ballast from time to time, which is a constant practice. You let a strip of, say, 20 miles go for, say, 5 years, and then ballast sufficient to take care of it another 5 years, and you do alternate stretches of the line every year. The depreciation of ballast is a depreciation of the railroad.

I did not measure or ascertain the degrees of curve elevation; I knew it was not excessive. I saw 5 degree curves and decided that they would not elevate as we (N. Y. C.) would elevate them for our high speeds. I watched practically all the curves; I would judge there was no elevation over 5 inches. An 8 inch elevation would be proper for 40 mile speeds on 8 degree curve. There is an 8 degree curve in Zone 1, but at a very low speed point, and it is almost flat—

1374 one or two inches elevation; that would meet the needs of both kinds of traffic, as the speeds of the two classes of trains in zone 1 were practically the same.

A freight train on that curve with no super-elevation would cause some wear greater than on tangent; it would be on flange side of outer and top of inner rail. That excess wear occurs from a train traveling at a speed to which the curve was adjusted. An excessive elevation of the outside rail for a slow speed would increase the wear on the low rail and decrease it on high rail. As the outer rail is elevated in height above the needs of the particular train, the wear on outer rail decreases and that on top of the low rail increases. The percentage of curved track on the road determines primarily whether the excess wear on curves due to super-elevation is insignificant. Speaking of the South Shore, I should say the item was appreciable, on two curves of same degree, one elevated 4, and another elevated 1 to 2, inches, and the movement over both being at slow speed, nobody can tell what the wear due to higher elevation is; I should say there would be at least 10% difference in wear due to that particular cause. The increased wear is on ties also.

In zone 1, tie renewals are more frequent than outside that zone, they being 30% heavier there. The labor expended on main track in zone 1, eliminating exclusive freight track and branches, would run about double that in similar stretches in adjacent zones; this confirms my belief that the density of freight traffic in this territory causes greater tie renewal due to rail wear and to slow freight train movement, rather than to passenger trains. I should expect the cost of track maintenance per mile in zone 1 to be 1½ times the average of the adjacent zones, not taking into account the industrial spurs in that area maintained by separate forces. This is based on investigation and information.

1375 Excluding zone 1, a fair average annual maintenance cost for the remainder of South Shore per main line mile, taking into consideration all tracks necessary in operation, would be $1,000; the annual average for zone 1 would be probably $1,200, counting the double track as separate lines. My 1½ times as much refers to track

maintenance. There are other expenses which would reduce the proportion to $1,000 and $1,200.

The most destructive element of mechanical wear is the train speed. As between the allowance which must be made for speed alone and that made for extra effect of locomotives, I am not prepared to say which is the greater; either one might be greater under certain conditions of speed. The effect of same locomotive would vary with speed; it might vary with different roadbed conditions. Before I could say that excess speed in passenger service, as expressed in the difference between 20 miles freight, and 40 miles passenger, per hour, would be sufficient to overcome the excess weight of freight, the effect would have to be calculated; but I believe that it would to the extent I have calculated by the application of my formula. That produced a ratio of 60% passenger and 40% freight; the difference is due to squaring the speed in each instance, and applying it to weight of entire train, including locomotive. This formula is the formula for impact. After applying the formula and finding the ratio of 60% passenger and 40% freight, I brought in other elements; my final judgment rested on a 50-50 basis. The modification was due to different traffic densities in the different zones, and numerous other comparatively minor, some trivial, and some appreciable, results and things that affect the problem; I want to be, and believe I am, as fair to the problem as it is possible to be, and that has permitted me to say that a 50-50 ratio is one limit and a 60-40 the other, and that the proper basis is between the two extremes.

The largest factor of reducing to a 50-50 basis was the conjestion of traffic in zone 1.

1376 Q. Why should you use that zone for the purpose of modifying your figures, when the traffic, that is, the tonnage and the mileage, in that zone enter- into the original computation of your 60-40?

A. In the absence of statistics that apply to each zone separately, and using statistics only that apply to the property as a whole, there is a possibility of grave error creeping in that might give a very unfair result, but the fact that the traffic in zone one is so dense relatively to the traffic on any of the other zones convinces me that the 60-40 ratio is a fair maximum ratio, so to speak, and the 50-50 ratio a fair minimum ratio. If we would exclude zone one from the calculation, I believe the ratio outside of zone one would run as high as 70 to 30, or even 75 to 25, by actual calculation, but we have zone one with us and must take it into consideration.

That 75-25 is without giving effect to extra locomotive loading. To add for the locomotive effect would cause the percentage outside zone 1 to go to some point between 75% and 80% passenger and 25% and 20% freight; this would be a subject of calculation.

I think the refinements of track due to passenger service are included in passenger side of my computation, though I would not attempt to give amount there included, and no one could tell without statistics. All computations should be based on the highest passenger speeds fixed by the rules, and not necessarily by actual speeds; the trains run below the speed as often as above, and the variation from

the established maximum is so slight as to be inappreciable. You would not be able to get closer results of actual wear by taking each train with its weights and speeds separately, because you must keep your track up for your low speed train as much as for your high speed train, where you may reasonably expect such trains to run; your bridge and track must be strong enough for your heaviest load.

1377 My modification from 60-40 to 50-50 includes the recognition of those elements of extra freight cost which I admit. I would not attempt to tell you the degree of importance I attach to any particular one of those by percentage, or in any way, with my present extent of study; the degree of importance that I would attach to all of them would be 2%. The rest of the modification would be due to all other causes; the margin is wide enough to cover a multitude of sins.

Even when we get done, we do not know where the precise figure falls, with the statistics and figures we have. If we had statistics for each zone, we could more closely approximate certainty, and if we had statistics for each mile of road, we could still more closely approximate certainty; in such problems, as you go from the general to the particular, you are reaching certainty. It is not dangerous to speculate on generalities when you have nothing better; this is the best that can be done. I don't know anyone that has attempted anything as near; without a doubt, it is nearer than the revenue train mile basis. I have never heard of this particular formula being applied by any one.

I applied my ratios, not only to mechanical wear costs or expenditures produced thereby, but also to those produced by causes having nothing to do with mechanical wear. This is on the theory that I know no better method; I believe that is the best method, and the tail should go with the hide. Ordinarily, I think the mechanical wear cost is the greater, taking the entire structure. I have never been able to fix any proportion of the percentage of total maintenance cost due to weather and to wear, and have never put it into figures for particular items; other engineers have done so, but have varied greatly. I have noticed that one man says ties should be 90% wear and 10% weather, and another might reverse it. On South Shore, if we double the speeds of all the trains, the weather costs might increase very slightly.

1378 The increased speed might, for instance, "pump" the ballast, but, so far as a fence or building is concerned, the weather effect would go in the same ratio, whether the speeds were 10 or 90 miles an hour, or the tonnage large or small.

I do not apply the same formula to weather and mechanical wear costs as a theoretically correct proposition, but think it fair in this case. Applying the average train speeds, of passenger 27 and freight 16, to the ton miles, would produce ratios of 53.7% passenger and 46.3% freight; increasing the passenger speeds to 50 miles per hour, the results would be 91.03% passenger and 8.97% freight. That speed would materially change my opinion as to the application of this formula to expense of replacing depreciation due to decay, but would not change it as to the proportions due to the destructive effect

of traffic. I am not satisfied that in all instances the weather cost and use of the track should follow the results of my formula.

I would not say the formula was incorrect because of the variation between 53-46 under average speeds of 27 and 16 miles, and 60-40 under average speeds of 40 and 20 miles. With speeds of 50 miles passenger and 10 miles freight, I would not apply the formula to weather costs, but would as to speeds of 20 miles freight and 40 miles passenger, and 16 miles freight and 27 miles passenger. It is difficult to determine the limits where you would cease to apply it, unless you have all the facts as to the condition of the property. There comes a point at which we must leave the formula and apply our judgment in the division of weather costs and in the division of the property. There is no connection at all between weather costs on the same basis as mechanical wear; it is a mere coincidence that I should use it in this case.

The property and weather costs should be divided in proportion to priority and proportion of their use, and you would apply a
1379 judgment in each case; it might be necessary to go into detail as to each particular item of the track structure; as we become particular, we become certain. The mechanical wear cost does not vary directly with the tonnage; it varies more nearly with the square of the speed, which would be the maximum condition—the theoretical perfect condition.

The track damage would not necessarily vary with the square of the speed, but the cost of maintaining the track for speeds of 90, as against speeds of 20, miles an hour would vary as the square of the speed. The average cost per mile of track, including sidings, equated 2 to 1 on the Mohawk Division of New York Central, including all maintenance expenses, varied from about $1,200 in 1908 to about $1,800 in 1913; those tracks are all maintained for speeds of 35 miles per hour; some for speeds of 60 miles per hour, and, upon this, speeds of 90 miles per hour are attained, and we have to make good the depreciation caused by the 90 mile speeds; when I say speed is maintained for 60 miles an hour, I have special reference to curves on which 90 miles are not attained. On tangent maintained for 60 miles, 70 or 80 miles is perfectly safe, and the limit beyond that point is the limit of the engine and cars.

On South Shore, the maintenance for 40 miles an hour would permit speeds to 63 miles, or possibly beyond. I have never made any investigation to compare effect of speeds of 10 miles with speeds of 20 miles per hour on track; the difference between those would be small. As between 20 miles and 40 miles, the difference in destructive effect would not be appreciable, but in the cost of keeping the track in proper condition for such speed, because of the elements of wear and exposure to the elements, it would be appreciable. The cost of maintenance to permit speeds of 20 miles an hour would be more than twice as much as for 10 mile speeds; applying the formula of
1380 M. V. squared as between speeds of 10 and 49 miles, it would cost 16 times as much for the latter. In applying formula for the speed, the increase from 10 to 20 miles multiplies your track expense attributable to that particular speed by 4; if the speed goes to 40

miles, it multiplies by 16, if the speed goes to 60, it multiplies by 36, and if to 90, it multiplies by 81, assuming the same tonnage for each train.

If South Shore were maintained for freight traffic alone, the maintenance expense would be 20% to 25% less. That is purely a question of judgment, upon which I have made no figures; it is in the nature of a guess. That would be the average in all items of the track structure. Track labor and tie and rail expenses would be less if we dispensed with the passenger traffic. I have never made any test to determine what the difference would be in expense for ballast if there were no passenger service, and know of no one who ever did, though I think there would be an appreciable difference on South Shore.

In saying what would be a fair amount to spend per year for South Shore ballast, assuming conditions to be as they are, you must take into consideration that the South Shore has evidently been neglected in years gone by, and that some of the present day expenditures may be due to that fact. Assuming the South Shore was in average good condition at all points, I would say an annual expenditure of $25,000 per year for ballast would be about right.

If it were indicated to me, before I said that the road was ballasted beyond the needs of the freight service, that in 1910, 1911 and 1912 the expenditures for ballast, according to I. C. C. classification, were under $7,000 a year (which is the fact), I would give more study to my answer, and would probably reduce my figure, as it was a very hasty estimate, from my own standpoint, where we maintain a very high standard of excellence of track, much higher than South
1381 Shore, and I might not be able to get down to a sufficiently close approximation of their absolute annual needs of ballast; I might be doing them a grave injustice by saying that they ought to spend $25,000 a year for ballast.

If they spent $7,000 each year for 3 years previously, and in 1913 spent $25,000, I would say that they were either discounting the future or paying for their past debts. In my estimate of $25,000, I would include putting in the ballast, but I am satisfied that that would be a very high average annual renewal of ballast on the South Shore. If this were a slow freight line, without passenger traffic, cinder ballast would be ample for the surface, but they are now putting on the more expensive gravel ballast. Assuming the South Shore to be engaged solely in carrying freight, I would expect it to spend less than $7,000 per annum for ballast,—meaning, if the passenger service was taken off and the freight service was not increased in speed or volume,—including the cost of applying the ballast, at least 30% less, which would represent the difference between St. Ignace ballast and cinders.

Where the track returns, after the train has passed, to practically the condition in which it received the train, the elastic limit is not passed, though there would be quite a large track damage. A low joint springs up to its former surface. A rail does not acquire a permanent set, but the ballast is depressed and a permanent set occurs in it; the elastic limit of the ballast has been reached to the extent that it

has been displaced—that and the roadbed beneath it. That would be a very minute degree for each train passage.

Q. So you don't agree that the train, traveling at a fast speed over a reasonably level and straight track, would cause somewhat less wear at a higher rate of speed?

A. I do not.

1382 Q. Due to the fact that it is a shorter time in the place, and that there is a motion which keeps it up?

A. There is no such motion.

Q. You don't agree with that?

A. I don't agree with that proposition. The whole track structure is depressed below the normal plans, and there is an appreciable wave or elevation of the track material ahead of the train; the enormous weight of the train presses that structure down in the ground, and there is a perceptible wave ahead of the wheel, and that little front wheel of the locomotive is climbing up hill all the time, and shoving that rail ahead of it, and in time causes that rail to creep, even up hill, where fast speed is made.

Q. Isn't that hill a little higher before a train that is standing still than one that is in motion.

A. I have never measured it. I don't believe it is.

Q. You don't know?

A. I don't know, but I don't believe it is, from my experience.

Q. You don't know whether it is a little higher ahead of a slow moving train than ahead of a fast moving train?

A. I don't know by actual measurement, and I never had occasion to measure it on slow running trains.

Q. Applying the rule of physics to it, it would be lower in front of a fast moving train than in front of a slow moving train, would it not?

A. From my experience, I would expect it to be higher ahead of a fast train than ahead of a slow train.

Mr. Eldredge: Of course, you both mean equal weights, I take it?

A. Yes, equal weights; the same engine.

1383 The Master: Does the attraction of gravitation act to the same extent on a fast moving body as it does on a slow moving body?

A. My recollection of the force of gravity is that it is constant.

The Master: Does it have the same effect?

A. I believe so; that is my recollection of it, except possibly when you come into discussions of the inertia of the mass.

The Master: Doesn't the momentum of the body have a tendency to overcome, to some extent, the attraction of gravitation?

A. Yes.

With respect to yesterday's testimony regarding Thompson's alphabet, I didn't mean to include in the 2% estimate that I made on cross examination the excess tonnage, or the property feature; that 2% allowance was made in reducing passenger to 60% and freight to 40%, from 62% to 38.75%.

I didn't examine the South Shore bridges closely, and could not tell you that I noticed a good many wooden trestles; I did not find

out how many there were for the freight service alone. The higher speeds, even to 90 miles an hour, are made across bridges. On a single span of trestle, no more than one locomotive would be permitted at a time. Generally speaking, the customary practice is to assume a certain load, of, perhaps, double header locomotives, and a certain weight per foot of train behind it. The stresses are figured out for that weight, and then in the calculation a certain allowance is made so it will stand a strain of 4 or 5 times that, and that is called the factor of safety. The greater the span, the slower the speed—the lower you can have your factor of safety. It is not likely that any one of the spans of wooden trestles on the South Shore would stand the weight of 20 locomotives, standing still. I would not say that it is not a fact that a locomotive rolling across a bridge with power shut off does practically no damage to the bridge; I will say
1384 that it might be less, because of absence of tractive force and the effect of counter balancing.

Q. Now, Mr. Lindsay, assuming that the load for which a bridge is designed is four or five times the weight of the locomotive, and assuming that your formula, at speeds of 40 miles an hour, provides for locomotives piled three miles high, one on top of the other, isn't there something wrong with your formula?

A. The assumption is absurd.

Q. If your formula produces that, isn't your formula absurd?

A. It is not, because the assumption is incorrect, in the beginning, and violates all principles of bridge engineering.

Q. Assuming, also, that the application of your formula, at speeds of 60 miles an hour, assumes locomotives piled seven miles high, on top of each other, that is the weight that you have provided for, that is, the loading of the weight by the square of the speed at 60 miles an hour, would you then concede that there is something wrong with your formula?

A. I get your point. The action of a moving train on a bridge, if the bridge is on a curve, the mass is not standing upright, but it is horizontal, and you get the longitudinal effect of that mass striking the bridge on the curve, and not the vertical load.

Q. Then your formula is the formula for direct impact, is it not?

A. It is the expression of, I think, Newton, who calls it kinetic energy.

Q. But you engineers term it the formula for direct impact?

A. Bridge engineers, I think, probably used that term, and in their calculations they probably confined the discussion to the exact amount of the train and engine and cars on the bridge, or
1385 that may be on the bridge, at any given time, with due allowances for speed.

Q. I also wish to call your attention to the fact that applying your formula at 90 miles an hour assumes locomotives piled 16 miles high on a single point on the bridge or on the track structure, wherever it might occur; that would be absurd, and the bridge and locomotives would all go down very materially, wouldn't they, if there were 16 million pounds.

A. The assumption does not follow my ideas at all. As I have

explained, the mass moving in a horizontal plane, assuming a level track and rolling across a bridge, the effect of it is the thrust in a horizontal plan, and not a vertical; on the bridge, you would only get the vertical component of that load.

Q. Yet, you have assumed that the track damage will vary with the square of the speed?

A. The cost of maintenance of bridges is so relatively small, as compared to the cost of maintaining track, that it has been given a very small value in that formula.

Q. Let us eliminate the bridge for a moment. Your formula, then, applied to the track structure, assumes that the damage to the track increases as the square of the speed?

A. Yes.

Q. And the square of the speed, increasing to 90 miles an hour, would multiply the tonnage by 8,100, would it not?

A. By 8,100.

Q. By 8,100, and that assumes, does it not, that the damage to track structure at 90 miles an hour is 8,100 times as much as at one mile an hour?

A. Yes.

1386 Q. And that same thing can be applied to speeds of 60, where the multiplier produced by the square of the speed would be 3,600?

A. Yes.

Q. And also 40, where the multiplier produced by the square of the speed would be 1600?

A. Yes.

Q. I understand that fully, and I understand the method of your application. Now, take on ordinary sidings, like they have on South Shore, about what speeds would you advise on those?

A. 15 miles per hour.

Q. The maintenance would be for 10 miles an hour?

A. Yes.

Q. And the limit of safety might carry it to 15, or even, possibly, a little more?

A. Oh yes, much more.

Q. On those tracks which are constructed for speeds, we will say, of 10 miles an hour, you have said they bear the ratio of 2 to 1, or approximately that, to mileage of main line?

A. That is the ratio that we used.

Q. That is about a proper ratio, 2 to 1 to 3?

A. That is debatable; Mr. Thompson makes it 3 to 1; some make it others; some make it less; the whole subject is still under discussion by engineers, generally—by the largest engineering body studying railway problems in the world.

Q. Applying your formula to that particular track, and raising that particular track to a 40 mile an hour track, while you carry it at the ratio of 2 to 1, or something like that, would, under your formula, involve the expenditure of 16 times the amount

1387 that you have in there; does that indicate anything to give you any doubt about the correctness of your formula?

A. I have from the very start said that the V square would be the maximum, and that that would have to be shaded, as based upon, or determined upon, other conditions. The fact is that we have on our slow tracks, on the Mohawk Division of the New York Central railroad, been operating our slow freight trains at speeds of about 15 or 20 miles an hour, but the increase in the density of traffic has necessitated our operating the trains on those slow tracks at high speed, and it has resulted in a very material increase in the expense of maintenance of those tracks. We don't separate the costs as between one track or the other. I cannot say, but I know that we have had to take out all the 80 pound rail and relay it with hundred pound rail, and increase our tie renewals, and use stone ballast instead of gravel ballast, and that process must continue, and it has increased our labor cost, etc. There are a great many elements in the maintenance of the track that, perhaps, are not affected by the square of the speed, may be directly as the speed, and so on.

Q. I have understood, throughout, that your formula provided, not for track destruction, but for maintenance to the point of permitting the certain speed?

A. Generally so.

Q. Permitting, say, the speed of 40 miles an hour, if that is the speed that we use, the excess cost over trackage permitting speed of 10 miles an hour would be the difference between the square of the speeds multiplied into the tonnage; that is your formula?

A. I mean to say that, as tonnage increases, expense of maintenance increases, but it does not increase in direct ratio.

Q. My question was principally directed to the speed part?

A. I was coming to the speed, and my contention is that,
1388 as speed increases, the cost of maintenance increases more than at a direct ratio, and that I believe it is somewhere between a direct ratio and the square of the speed.

The Master: That is as far as you go, is it, to say it is somewhere between the direct ratio and the square?

A. Between the two. The whole subject is so unstudied, I might say, and still so vague, that I wouldn't undertake to say that that is an absolute formula. M. V. square could be applied with unfailing reliability and accuracy to all the details and to all cases, but I believe it is a fundamental principle underlying the whole proposition.

The Master: That is an enormous difference, isn't it, between a direct ratio and the square?

A. The direct ratio, under the assumptions of tonnage that have been given here, would change the relative passenger and freight from 60-40 to 45 passenger and 55 freight.

Q. The direct ratio?

A. Yes sir, I have got it 45-55—45 passenger and 55 freight, instead of 60 passenger and 40 freight. Those are the limits between which I would expect to find the right line.

Q. Now, referring again to the branch tracks and the equation of 2 to 1, on that assumption it would double the expense to raise the secondary track to the point of the main line, on the assumption of

2 for 1; and yet, if you apply the direct ratio of increase of speed to 40 miles an hour, you would multiply it, instead of by 2 by 4; that is the fact, is it not?

A. Yes.

Q. And if you used the square of the increasing speed, you would multiply it by 16, instead of by 2, would you not, with the speed of 40 miles an hour?

1389 A. I cannot follow your logic.

Q. I am asking you to answer the question. I don't care anything about the logic of it; I want you to answer the question, yes or no, or show me where I am wrong in asking it?

A. I don't understand the question.

Mr. Wykes: Read it, Mr. Luther, please, and let the record show you read it.

A. Could I delay the record long enough to write that question out, and let me look at it?

The Master: Yes.

Mr. Eldredge: I suggest that I think, from what the reporter read, he must have what precedes it or he cannot answer it intelligently at all.

Q. Before we go to that, there are the correct figures on the figuring that you did; will you check yours, to see whether you are right. Let me put it in another shape, that Mr. Parker has it here on his sheet, and perhaps we can get it in shape. Mr. Lytle has testified to a cost of maintenance for this secondary track of $350 per mile, and we will assume that it is kept in condition for 10 mile service, that is, for a speed of 10 miles; that fluctuates up. Main track, you have said, and I think the record proves that you are about right, costs $1,000 a mile to maintain; now, applying your formula to the branch, maintained at $350, squaring the 40 miles that is permitted on the main track, we produce a factor of 1,600 as the square of the speed; now, multiplying that speed into the cost of maintaining the track at 10 miles an hour would produce a cost of maintenance for main line of $5,600 per mile?

Mr. Eldredge: One moment. I object to the question, because the assumption is that the expenses to which witness has been referring include only the expenses that the witness has been

1390 applying his formula to, whereas, as a matter of fact, they include many other and different items of increased cost, to which the witness has not attempted in any way to apply his formula.

Mr. Wykes: You must not forget that Mr. Butler took Mr. Riggs through the items of maintenance of these spur lines, and that the items of maintenance that were left when he got through were limited practically to those which this witness says he affects with this particular factor.

The Master: You may put the question as a hypothetical question.

A. Do I have to answer that question by yes or no?

The Master: You may explain.

Q. I wish you would answer it by yes or no, first, if you can.

A. I would say, theoretically, yes; but that is the striking and strongest proof of my argument that the expense does not increase with tonnage at slow speed—that, on a track of that character, you can increase your tonnage without materially increasing your expenses.

Q. But you cannot increase your speed without increasing your expense in accordance with the square of the speed, if your formula is correct, can you?

A. With the modifications that I have said as between the square and the direct.

Q. Making the modifications that you have given would reduce about 20 per cent; reducing the 5,600 by 20 per cent would take out of it less than $1,200?

The Master: How do you get the 20 per cent? I don't understand.

Mr. Wykes: It is the difference between 60-40 and 50-50, or, as he has put it this morning, 45-55.

The Master: The difference is the difference between the direct ratio and the square; that is the difference?

1391 Mr. Wykes: I fear you and I are not talking about the same thing.

The Master: Perhaps not.

Mr. Wykes: The witness has stated that, due to the fact that this peculiar condition resulted, he modified his formula from 60-40 to 50-50; what I wish to indicate is that, inasmuch as his modification was only a modification of 20 per cent, whereas it should be a modification of something like 600 per cent, he is evidently wrong in one place or in the other place.

Mr. Cotton: I object to the question on the theory that it assumes that the effect in the direction of a moving train is the same as if it were a vertical effect, and that there is no direct ratio between the striking effect of these two influences, or the two trains, and the expenses of the maintenance of the track.

Mr. Wykes: My dear sir, you must not forget that your witness' formula was a formula for vertical effect, or horizontal effect, I don't care which it is, horizontal effect of impact. Go back and read the question, Mr. Luther.

Mr. Eldredge: I am utterly unable to understand the question.

Mr. Wykes: I understand it thoroughly, and I also understand the witness' theory.

The Master: Let us find out if the witness understands.

Mr. Eldredge: That is no evidence that I do, and if I cannot understand it I would like to be certain that the witness does understand it before he answers it.

A. I don't know that I can answer your question, because I cannot follow your mathematics.

The Master: You don't understand the question?

A. I cannot comprehend what he wants me to decide upon.

1392 Q. We will get back to it again.

A. All right.

Q. You told me, what I stated, producing the cost of $5,600 a mile was theoretically correct—you said theoretically?

A. Yes.

Q. Now, in applying your formula to the tonnage, you did apply it theoretically, didn't you, in reaching to 60-40?

A. Very generally.

Q. You simply worked out the mathematical computation upon the tonnage as it was given to you?

A. To get 60-40, yes. I made the assumption that the tonnage was uniformly distributed all over the entire territory, and that all that tonnage struck every portion of that territory.

Q. And then you modified that from 60-40 to 50-50?

A. Yes.

Q. The range of difference between 60-40 and 50-50 is not over 20 per cent, is it?

A. I would have to figure that out. You have me so confused that I don't feel that I could properly pass upon it at the present time.

Q. I will say that it is about 20 per cent?

A. I am willing to accept your statement.

Q. A computation will indicate it at any time, on the figures that are on the record.

A. All right.

Q. What I want to get at is whether your modification is sufficient if the result of the application of your formula is to increase the maintenance of secondary track, which costs $350 a mile and which, on your testimony and on the testimony of Mr. Riggs, would cost from $700 to $1,000 a mile to raise to the point of main line,

1393 and if it is indicated that the application of your formula, instead of raising that to $1,000 a mile, raises it to $5,600 a mile? Let him answer it, and then put in your objection.

Mr. Eldredge: One moment. I will make my objection before he answers it, where it belongs. The witness' formula has only been applied to the destructive effect of traffic; the question implies that it applies to the difference in the cost of the construction of road, to which the witness has not applied it in any way, shape or manner. The question is directed entirely to the difference in the cost of construction of road.

Mr. Wykes: I beg to differ with Mr. Eldredge's statement, because the witness' formula was not directed to the making good of the elements of wear, but to provisions, as he stated, for taking care of a track at 40 or 60 miles an hour, or at whatever the high speed might be. Have you the question in mind?

The Master: Do you desire to have the question read?

A. Yes sir. The formula could not be applied to a condition of that kind.

Q. Let us take a condition of another kind: You have stated that to maintain the main line of the South Shore outside of zone one would take approximately $1,000 a mile per annum; you have also stated that, if you got rid of the passenger traffic, thus reducing your speeds to the freight speeds, you could reduce the costs by 20% or 25%, and yet the application of your formula, instead of indicating a difference in costs of 20% to 25%, would indicate a difference in cost which would raise the lower figure 16 times; then, is your formula correct?

A. The formula is correct, but the application of it is wrong, because you are applying it to other elements than those which
1394 are due to speed. You are applying it to everything, whether affected by speed or not, and my other figures were based upon the general maintenance of the property.

Q. That is true, but the effect, then, of the application of your formula to the speed items would tend to increase those 16 times; that is correct, isn't it?

A. It looks so, on the face of it.

Q. And yet you have only allowed 20% to 25% difference between the two services?

A. That is right.

The Master: Isn't the difference between the direct ratio and the square so great as to render the formula practically of little value?

A. The formula is, I believe, fundamentally correct in those items which speed affects; there are items in maintenance of track which speed does not affect.

The Master: With so great a margin, is the formula practically of much use?

A. I believe it is.

The Master: It leaves us very much in doubt as to where, within the margin, the fact lies.

A. There is perhaps an area there of doubt, a river of doubt, so to speak, but I believe that the use of a proper consideration for the speed at which traffic moves is fundamentally the principle on which the division should be made.

The Master: By assuming that to be true, is this formula which you have given the best and most accurate way of getting at that?

A. I believe so.

The Master: You don't know of any other way?

A. I know of no other way.

1395 Q. Your formula is a rule, but you admit that it must have modifications?

A. Yes.

Q. Now, give us the rule, so as to make it a part of the total rule—the rule of modifications?

A. That is largely judgment.

Q. Entirely judgment, is it not?

A. Entirely judgment, so far as this science has advanced.

Q. And so, in the application of your theory, the question of whether there is a profit or a loss in a particular service gets down to the point of depending upon the judgment of the witness, does it not?

A. Largely. Engineering, you know, is education 2% and 98% common sense.

Eccentric wheels are somewhat more numerous in freight than in passenger service. I have never ascertained the degree of variation from round. In freight service on South Shore, assuming 3,000 cars, there would be 24,000 wheels, and in passenger service, assuming 71 cars, there would be approximately 850 wheels, so, depending on speed, if there is damage due to that element, it is more prevalent where the wheels are more prevalent. At equal speeds, it varies with the number of flat spots, or eccentric wheels; the action of a small flat spot is greater at high than at low speed.

At equal speeds, it would increase as the number of wheels increased. The presence of foreign cars, representing an interchange debit balance of $46,000, or 100,000 foreign car days in a year, would also weight the freight side to some extent. The freight car
1396 wheel is ordinarily cast, and not turned. The eccentricity which may result is due to the different rates of shrinkage of the casting as it cools, and in part to the density of the metal as it cools. Some parts of the wheel wear out faster than other parts; there are often differences of as much as one-half an inch in the thickness of a locomotive tire, and that causes track injury at high speed. Locomotive and passenger car wheels are a true round when they come out of the factory, and they vary only as sliding or breaking causes wear. A very slight irregularity, whether flat spot or eccentricity, will produce, at high speeds, perceptible track damage; the damage at slow speeds—say, less than 30 miles per hour—is insignificant. I do not think that they would produce much damage below 30 miles an hour, but at greater speeds we see the effect of the flat spot on the rail.

I have never figured out the maintenance cost of producing a car mile, a train mile, or a ton mile, and know of no one who has. I have not attempted to refine that problem between the different speeds, at all.

I watched the South Shore ties closely, as I rode over the tracks to note rail cutting and rotting, and examined the percentage of renewals, and I gathered the impression that the renewals were ample and well distributed. A good tie life for a tamarack tie in this country would be 6 or 7 years; if the line were devoted to exclusive freight service, dependent on ballast conditions, the life would be in the neighborhood of 6 or 7 years, and, if you had a mixed service, you would probably get more than 6 years life out of them. We take ties out of our railroad on passenger tracks sooner than out of freight tracks. Assuming the L. S. & I., practically an exclusively freight road, has tie renewals on about the same ratio as South Shore, rather than say South Shore was not maintained beyond the needs of the freight service, I would say L. S. & I. was maintaining that track to a higher degree of excellence; whether higher than necessary would depend on the charac-
1397 ter of their freight traffic, of which I am not able to judge.

Track maintained at a lower standard of excellence than the South Shore might increase the cost of their car and locomotive repairs; just what the extent of that would be it would be diffi-

cult to ascertain or estimate; you would have to have experience to do that.

My answer, that the passenger cost of carrying employees and free passengers was inconsequential, was that it was generally so relatively small that it was inconsequential; I have no figures to indicate that, and can only assume by analogy to our own experience. You could add 10%, 15% or 20% more passengers to the moving equipment, without increasing costs, on the same principle that you could increase the tonnage in a dense territory without increasing expenses.

My formula makes no provision for the segregation of tracks used exclusively in certain services, and makes no loading for the greater use of terminals, extra sidings or switches, or things of that character, by freight service; it simply applies to the line over which the speeds taken into account are made. To properly apply that formula, you would have to divide the territory, first into zones, then allocate tracks wherever possible, and apply the judgment, after that. If it were indicated that 32% of the time of freight trains is engaged in doing stational work, that, so far as the cars are in motion, would weigh the freight side.

An ordinary freight train of 30 cars would be 1,200 feet long, and it would be good operating wisdom to make the passing siding long enough to take care of a train of that length. Where you have a longer passing track than your longest freight train, that would possibly involve its use by two freight trains. It is as necessary to get the passenger train by the freight as to get the freight by the passenger train, and the freight by the freight.

1398 LINDSAY.

Redirect examination.

By Mr. Eldredge:

On our fast passenger tracks, it has been necessary for us to restrict the speed of engines running light to 45 miles per hour, as we found that above that speed causes undue injury to the tracks; a locomotive running light would do more damage than drawing a train, at the same speed.

LINDSAY.

Recross-examination.

By Mr. Wykes:

In my conferences with Mr. Eldredge on the days since going over the line, there were present Messrs. Eldredge, Cotton and Tracy; and, at one conference, Messrs. Berry and Howard were silent witnesses. I went over the evidence that was presented to me before them. (They have been present in the court room during most of the witness' testimony.)

1399 On July 16, 1914.

JOHN B. BERRY, a witness called by plaintiff.

Direct examination.

By Mr. Cotton:

I live at Oak Park, Illinois; am a Consulting Civil Engineer. After graduating from high school, I graduated from Day's Academy, as a civil engineer. I devoted one year to a post-graduate course in the same school, in higher mechanics and designs of bridges and trestles. I worked, during vacations, on the West Shore terminal at Weehawken, N. J.

My active work began with the Northwestern, with whom I spent twenty years, the first fifteen on location and construction of new lines, and as Roadmaster, Bridge Superintendent, and Division Engineer of what was then known as the Wisconsin and Galena divisions. As division engineer, I co-operated with division superintendent in getting economical operating results. The last five years of service with Northwestern I was Chief Engineer of lines west of Missouri River, in charge of location and construction of new lines, and had a strong voice in the maintenance of the existing lines.

I then went to the Union Pacific, as Chief Engineer, when Mr. Harriman bought in, and was with them over seven years. During that time, we developed and built and changed all of the Union Pacific railroad as it is today, and developed other lines, since built.

I was also, for two years, Consulting Engineer of the Oregon Short Line, directing its policy of economics, and with the Oregon Railroad and Navigation Company, in consultation on engineering questions. With the latter, I acted because Mr. Harriman directed the presidents to consult with me in all of the economics or large engineering questions on their line.

1400 While Chief Engineer of the Union Pacific proper, I kept close track of the use of rail, ballast, expenditures per mile, the economics of grade reductions, changes of line, etc. While there, I was delegated to investigate other lines Mr. Harriman had in mind to purchase. At the time that they talked of building what is called the Lucin cut-off, Ogden to Lucin, about a hundred miles, I was a member of the Board consisting of Mr. Hood, Chief Engineer of the Southern Pacific, Mr. Krutschnitt, General Manager, Mr. Burt, President of the Union Pacific (also engineers), and myself, as to the desirability of building the line.

After connection with the Union Pacific, I went to the Chicago, Rock Island and Pacific, as Chief Engineer, with duties similar to those on the Union Pacific. While with them, over seven years, I was part of the time Supervising Engineer of the Frisco lines. At the time of the divorce of the two roads, I was divorced from the Frisco work. During that period, I did considerable special work. For example, the Grand Trunk & Wabash used the same tracks from

Detroit to Suspension Bridge and Black Rock. The Wabash wanted a new contract for trackage over the Grand Trunk. They employed me to work up the value of that line; they accepted my valuation.

I also served in charge of the valuation of a piece of joint trackage between the Illinois Central and Vandalia, part of the Pennsylvania system, between Maroa and Decatur Junction. They accepted my decision and valuation. I made a report regarding the value of other lines for the Union Pacific, and worked for them until April, 1914, when I resigned and opened an office as a Consulting Engineer, in Chicago.

While with the Rock Island, I was Chief Engineer, until I resigned as such, in April 1913, at the request of the President, and for one year I was Assistant to the President of the Rock Island.

1401 During that period, I was one of five engineers of the western group of railroads, lying north of the Ohio and west of the Pacific coast and south into Texas, in negotiations to agree upon basic principles as between the Government and the railroads, under Federal appraisal, meeting with the Government and Mr. Prouty; when I left the Rock Island, I left that position.

I am the Mr. Berry to whom the President of the United States tendered a position as a member of the Board of Consulting Engineers, to determine upon the advisability of either the sea level or lock of the Isthmian Canal.

I have also done work for the Canadian government, making a report regarding the Grand Trunk Pacific.

While Chief Engineer of the Rock Island, I was employed by the Northern Pacific, to estimate the value of their property to be used in the Minnesota and the Spokane rate cases. I did that, and testified in both cases.

I am a charter member and was twice director of the American Railway Engineering Association. I was one of the first members of the Economics Committee; am now a member of its Rail Committee, and a joint member of the committee, of that Association and the American Society of Civil Engineers, on Stresses and Track, of which latter society I am also a member.

In 1898, when we started these large expenditures on the Union Pacific, about the only good work on the Economics of Railway Location was that by A. M. Wellington, a very very able man. The work called the Economics of Railroad Location, bulletin No. 49 of the American Railway Engineering Association, was the result of my effort to simplify the use and application of Wellington's work to work of location.

1402 I have had over 35 continuous years of service on railroads; about $150,000,000 has been expended under my direction during that period. I have given attention not only to railroad construction, track construction, roadway repair and maintenance, and railway operation, but also to the effect of operation on track, roadbed, bridges, trestles and other structures, and also in reference to the amount and causes of expenses incurred in the different kinds of business conducted by railways.

I also prepared the value of the Rock Island in Oklahoma and

Arkansas, getting ready for the two-cent rate cases in both states, and not only as to the value, but somewhat in the accounting methods of maintenance of way and structures subdivision, and, as to all expenses that could not be allocated, I was consulted, in a minor way, as to the best way of arriving at the percentages.

I spent four days in examination of plaintiffs' railroad, riding over it on trains; the purpose was to examine quite minutely into the general condition of track and structures. As a whole, I think the physical condition of South Shore as good as it ought to be for the character and extent of the traffic. On the west end, largely in Wisconsin, where they had much 60 pound rail, I did not think the condition of track hardly as good as it should be; this was true, Nestoria to the state line, though I thought, there, that even that poor rail rode as well as could be expected. I found the line, Nestoria to Houghton, better than I thought it was there. The condition of the right of way on the whole road was excellent, and much better than on ordinary roads.

The officers of the railroad with us always got out when we stopped to make any examination, and freely gave us all information we asked for. I found the frogs were of the latest type, and the split 1403 switches 15 feet long, well reinforced and of modern construction. I found a great many timber bridges had been taken out, filled, and culverts of reinforced concrete put in; the new type of bridges were ample for any type of locomotive then on South Shore.

I asked Messrs. Jackson and Stafford (division superintendents) how they were elevating curves, and they gave me their table. I wanted to see how it compared with results found. I worked out the formula and elevation in use by South Shore up to 7 degree curves on the basis of 35 miles an hour, as I was told that was, and it afterwards proved, about an average rate of speed, minimum and maximum. I found that the elevations they were using were very near to those I calculated for the formula. It was not alike around every curve; it never is, on any railroad, unless the maintenance is of a very high order, but it did not vary enough to be marked, except in a few cases. On the 20 curves that we examined we found no elevation higher than 5 inches, and only one of that height, and in my opinion there is no greater elevation on any of the curves I passed over. We examined only representative curves in Michigan, so as to get a representative statement.

The passenger train service on this road was fully as good as any other road similarly situated, taking into consideration the business necessities. On the inspection trip, we took observations of train speeds; for 9 miles west of Winthrop Jct., I took the speed, which averaged 35 miles an hour, including the little slow-up for Winthrop Jct.

On July 8, Mr. Howard and I took the time of arrival and departure of passenger train No. 1, St. Ignace to Marquette, at each station, and the time between mile posts for the whole distance; the results were platted on a profile. (Marked Complt.'s Ex. 95,

1404 Berry.) This profile correctly shows the results of our observations. Statement of the trip and results is as follows:

St. Ignace to Soo Junction:

Left St. Ignace at 9:38 A. M. Reached Soo Jct. at 11:20 A. M. Distance 42.9 miles; time 1 hour 42 minutes, or 25.25 miles per hour.

Deducting stops at intermediate stations, running time was 1 hour 20.5 minutes, or 32 miles per hour.

There were eight of these intermediate stops, and another point, Greene, where the train came very nearly to a standstill, making an average of about one stop every 4.3 miles.

It takes some time for the train to attain full speed after a stop. There is also a slowing down for a short distance as th estation is approached, so that to attain the actual average full speed between stations it is necessary to eliminate miles in which stops actually occur, and the preceding or following mile, when the stop is at or near the end of a mile. As it takes less time to slow down than to get up full speed, it seems probable that, considering trains both ways, full speed may be expected up to within a half mile of the station, and even past the station itself for such trains as fail to stop.

Eliminating from this run the miles in which speed was reduced for stops, as above indicated, as also the first two miles from the dock at St. Ignace, the speed ranged from 32.7 to 48.6 miles per hour, or an average for 26 miles of 42.5 miles per hour. These speeds ranged as follows:

Over 30, including 35 miles per hour, 2 miles.
Over 35, including 40 miles per hour, 5 miles.
Over 40, including 45 miles per hour, 13 miles.
Over 45, including 50 miles per hour, 6 miles.

Soo Junction to Marquette:

Let Soo Junction at 11:40 A. M. Reached mile post 155 opposite Marquette station at 2:57 (and backed into station at 2:59). Distance 108.4 miles; time 3 hours 17 minutes, or 33 miles per hour.

Deducting stops at 16 interme iate points, running time was 3 hours 3.5 minutes, or 35.4 miles per hour.

Eliminating from this run the miles in which speed was reduced for stops, as above indicated, as also the last two miles going into Marquette, the speed ranged from 30.5 miles to 53.7 miles per hour, or an average for 76 miles of 42.86 miles per hour. These speeds are as follows:

Over 30, including 35 miles per hour, 7 miles.
Over 35, including 40 miles per hour, 14 miles.
Over 40, including 45 miles per hour, 25 miles.
Over 45, including 50 miles per hour, 23 miles.
Over 50, including 53.7 miles per hour, 7 miles.

1405 On inspection trip, I noticed no maintenance or construction in excess of the requirements of the case, except, perhaps, the park at Marquette, park at Soo, and ladies' waiting room at Sidnaw; these are for passenger traffic, particularly.

It is in evidence that the average freight train speed is 16, and passenger train speed is 27, miles per hour, that passenger trains, frequently, for shorter or longer distances, make 35 to 50, and occasionally, but infrequently, 60 to 63.6 miles per hour, and that freight trains make occasionally, but infrequently, 25 to 35 miles per hour; under those facts, per unit of weight, the passenger train involves the greatest destructive effect upon, and requires the highest maintenance of, track, roadbed, track structure, bridges and trestles, on both curves and tangents, where the depreciation is due to mechanical wear, or destructive effect of traffic.

The locomotive is a more destructive agent, and has greater wear effect on track, than a passenger or freight car; the passenger engine running at high speed is more destructive than a freight engine of the same tonnage and character at low speed. The higher rates of speed and tonnage are more destructive to track than the lower rates of speed on a passenger train. The effect of speed is to unsettle the roadbed, hammer the joints harder, and make it necessary to spend more money to keep the track up to meet the conditions of high speed as compared with low speed; the effect is more pronounced on bridges than on track.

In my opinion, it has been the practice, where traffic was confined exclusively or almost exclusively to freight traffic, that there is not so much money spent on either material or labor, to keep the track up, as where there is combined passenger and freight service; that would apply to this particular instance. It applies in minor degree
1406 to bridges; to buildings very decidedly. I would not design a permanent bridge for a lighter load for freight traffic than for passenger, but for any wooden bridge I would wear it longer. The first and important consideration is to make your bridge and structure ample for passenger service, and guard against possibility of wreck. Freight locomotives run at slow rate of speed, and while you might design a structure with less impact for that lower speed, I know of no engineers who do that in connection with permanent bridges.

On the wooden bridges, you would endeavor to carry them along, and piece out by getting at the rotten part and putting in a post; in that way they would last longer. Also, a passenger engine, running at high speed, is more apt to produce a break or crack in a stringer or cap than the same weight of engine at low speed. In a soft, marshy country, the speed and tonnage of the passenger train is apt to settle the piles into the ground more than the freight train, and you would not try to keep up smooth surface for the freight, as you do for the passenger service.

These remarks would apply to ballast, rails, ties and track structures or appliances. This railroad would be required to expend in maintenance of way upkeep, if it had only freight service, at least 25% less than the present service costs.

Referring to Thompson's testimony, that the greater wear on curves is on outside rail, and that wear on outer rail on curves is about 20% above wear on tangent, and on inner rail about 5% above wear on tangent, I say wear on rail on curves depends on degree of curve, loca-

tion and speed. On lighter degrees of curve, say 1 or 2 degrees, the excess wear is but little; but, as you go on to the high curves, say 3 to
12, it increases very fast. I cannot agree with Thompson,
1407 that the wear on outer rail would be but 20% above the wear on the same rail on tangent. (Objection that, as this subject is deemed important, we should have actual figures of rail renewal on curves from company books.)

On the rails I examined on 4 to 7 degree curves, I would say that, with the same traffic, the rail on tangent of the same weight would last 10 times as long as on those curves on this railroad. On those curves, it is evident that the rail has been taken out at least once, and presumably more; in cases, the rails were transposed from lower to upper side. The tangent rail adjacent to that is frequently in good shape, with very little loss. Tangent rail everywhere shows that its life is a great deal longer than on those sharp curves, as quoted by Thompson (Note: Thompson did not refine his answer as to the degree of curve, and answered evidently as to his judgment of the average, while the witness has testified only as to the sharper curves.) On 4 to 8 degree curves, the life of the inner rail is but little longer than the outer, and it would not last more than twice as long; the tangent rail would outlast it 5 or 6 times.

I should say this railroad was in good condition, and reasonably well maintained and kept up for efficient service and safety, considering its present business. Taking into account the items of maintenance of way and structures which cannot be allocated, but which are common, I should say the passenger train mile creates the greatest amount of these expenses on this road; my only reason is that the revenue passenger and revenue freight train miles are very nearly the same, and, that being the case, with higher speed of passenger trains the cost increases.

Where there is no passenger service, the cost for maintenance of way and structures expenses would be much less; the speed of passen-
ger, as compared with freight, trains produces a large main-
1408 tenance charge, it having greater destructive effect on track, because the track is affected by speed as well as tonnage.

Answering Thompson's testimony, that the imperfections of freight equipment constitute the principal cause of expenses, over and above the difference in train weights between the freight and passenger train miles, and his 8 reasons therefore, I do not believe that the imperfections of freight equipment constitute the principal cause of difference in expenses over and above differences in train weights.

(1) It is true that car wheels in freight service are not run with their axles as nearly parallel as in the passenger service, but that is of small consequence.

(2) It is true that freight trucks are not so good or expensive as passenger trucks, but they are ample for the service they perform.

(3) The fact that freight car wheels are chilled iron, instead of steel tired, wheels is true, but it has no bearing on the question of difference in expense.

(4) That freight car wheels are eccentric, egg shaped and not true circles, is principally true, though the expression "egg shaped" is not

proper; they are not turned true, like the passenger wheels or locomotive tires, but are put on as they come from the factory, and may be a little eccentric, but not appreciably so.

(5) As to the freight train wheels, due to irregularity, being apt to freeze in the brakes, there is a little of that, depending on pressure, but I would say that it is extremely trivial, as the wheels on all passenger engines and cars wear spots on them as well as on the freight cars, being a little rough, so that they are just as apt to stick in one as in the other.

1409 (6) It is true that the springs under freight cars are not so expensive as under passenger cars, but they answer their purpose, just as the difference between a buggy and a lumber wagon. It would be a great misfortune for a freight train to have very much spring effect.

(7) It is true that freight trucks do not turn as readily on their centers as passenger trucks; but I do not think they need it; it is small, anyhow.

(8) I do not know what Thompson means when he says the irregularity of freight car wheels is an appreciable item of cost; if it referred to destructive effect on the track I would say no, because the speed of the passenger train, with better wheels, would produce a worse effect than the freight car wheels, with their little irregularity.

From my knowledge of this road, and knowledge generally, I do not think that these imperfections constitute the principal cause of difference in expense, over and above the difference in train weights, between freight and passenger train miles. I should consider the imperfections in the freight equipment a minor item. I have read Mr. Thompson's testimony regarding his gross ton mile ratio, on which he divides maintenance of way and structures expenses due to mechanical wear or destructive effect of traffic. I do not believe this is proper, as it neglects the excess wear due to locomotives as against cars, and neglects speed. It does not charge up to the passenger service as much as it should. In my opinion, weather stress is the principal item affecting ballast. On South Shore, I cannot give the percentage of expense of maintaining ballast properly chargeable to passenger; it would be more for the passenger than for the freight. I would not divide ballast on gross ton mile basis, or basis for mechanical wear.

The principal cost of tie depreciation on this railroad is rot; the minor element is mechanical wear. In 1914, they are going
1410 to put in about 333,000 ties, 290,000 in Michigan, 81% hemlock and 19% cedar. Hemlock and tamarack rot out before they wear out, and cedars crush by the service; so I understand, from these renewals and from the fact that I am advised that for one or two previous years there was a greater proportion of hemlock and tamarack than of cedar, that 81% of this year's tie renewals would fail due to rot, and 19% to mechanical wear. The average life of hemlock and tamarack ties in this country is 6 to 7 years; under some conditions, cedars are good from 12 to 14 and in cases to 20 years.

The greater causes of depreciation of ballast on this road are the passenger trains at the higher rates of speed; the moving load with

high speed has a tendency to crush the ballast down, and necessitates its renewal more often.

In my judgment, Ratio 1, gross ton miles, would not properly divide common expenses of ties, repair or renewals of rails, ballast, track maintenance and track surfacing and other material, because the gross ton mile considers straight tonnage, without consideration of engine effect or of speed.

In criticism of Thompson's application of the time ratio to common expenses due to weather stress, decay or erosion, that method of division of those expenses is not, in my judgment, proper or accurate for application to these expenses. The method is new to me. Of all the methods for pro-rating expenses or value, it has the least merit. As to its application to value, many of the charges don't vary with traffic. Supposing one passenger and one freight train a day, does it look reasonable to compare a passenger train over the road at 30 miles an hour with a freight train over the road at 15 miles an hour, and allot the proportion of value in that proportion? For an interlocker,
1411 it makes no difference whether the train uses 2 or 40 minutes, so long as it delays no other train. The expense is there just the same.

Take a bridge a mile long and a passenger train 30 miles an hour and a freight train at 15. The maintenance of that bridge for the passenger will be greater than for the freight train, without regard to its length on that slow train, because it is not interfering with another train, and the necessities of keeping the structure up to a higher degree of perfection, and the possibilities of damage to members of a wooden bridge, are greater by the passenger than by the freight. I think the crux of the whole thing lies in the fact that it is ridiculous to make such comparison, when you know all the facts are against it. That would apply also to the common expenses of maintenance of way and structures.

I cannot say where formula 4 could with justice and equity be used for any purpose whatever on a railroad. It should not be used in connection with depreciation, and it is grossly misleading. It is not proper, accurate, or approximately accurate to divide common expenses due to weather stress and depreciation. I never heard of gross ton miles for division of common expenses between freight and passenger, and never heard of Thompson's time ratio before. Thompson's time ratio is not proper to divide common property between freight and passenger service. On South Shore, the revenue train mile more nearly accurately measures the division of unallocatable expenses of maintenance of way and structures between passenger and freight traffic than the Thompson ratios, because it closely approximates what I think is the best method of dividing those expenses, and is nearest to certainty.

Other roads use the revenue train mile, but many other roads are using various other methods besides the revenue train miles, or even
1412 the gross ton miles. Some roads have been using the gross ton miles unequated; they have used other methods, such as cost accounting and speed ton miles. They are trying more nearly each year to get speed as a factor, as well as straight tonnage.

I know of no case where they have used gross ton miles without the equivalent of speed.

On bridges, the passenger locomotive at higher speed, if of the same or greater weight, and possibly if of lesser weight, causes the greatest destructive effect. The locomotive at high speed would produce a greater blow than lateral or side motion of locomotive at slow speed. The side motion would be small in comparison. A locomotive, being of heavier weight, its wheel would, at the same speed, produce worse effect than the lighter weight of a car wheel. I know what snow plows and devices are employed on this road, and where the greater cost would fall; it would be preferably to passenger. (Witness repeats the oft repeated claim of necessity of keeping the road open for passenger service.)

In reply to Thompson's testimony, to the effect that cost of taking the sidings by freight trains, to meet passenger trains, should be borne equally by passenger and freight, I am of the opinion that it is wholly a passenger expense. The freight train takes sidetracks at considerable delay and some expense, to let the passenger by. If it did not meet that passenger train, it could go on until it met a freight train, and there would be no necessity for that delay or expense. The passenger trains run first after road is cleared by snow plows.

I have read Thompson's and Lindsey's testimony regarding 28 reasons or elements alphabetically listed by Thompson.

The cost of transporting company material on freight trains, in my opinion, vastly out-weighs the cost of all the reasons Thompson has given against the freight, in favor of the passenger, trains.

1413 The greater tonnage of freight trains, as embraced in his first reason, would be very small.

The handling of people on South Shore trains free I would consider very small. I do not believe they ever had a single car for free passengers; until they do, the weight of the passengers transported free cuts no figure at all in the cost.

(Witness here led to change various answers to say that haulage of company material in freight trains would offset all items of Thompson alphabet but the extra tonnage.)

Mr. Thompson's statements in his alphabet, in a great many of the items, are correct as far as they go, but they are small, admitting a great many of them.

(*a*) Greater tonnage of freight trains. I do not know that that makes the freight train mile greater in cost than the passenger train mile; that is subject to analysis, and, in my opinion, with the revenue train mile in passenger and freight service very nearly the same—practically 50% each—I should say it is very small indeed.

(*b*) Greater number of wheel and wheel impacts in freight trains. This weights the freight side, but small in amount.

(*c*) Greater weight and tractive force required of freight locomotives. This may be true, but is very little; speed must be taken into consideration as well as weight.

(*d*) That freight train wheels, trucks and parts are not kept in as good condition as on passenger trains. This is true, but I don't think it cuts much figure.

(*e*) Greater axle loading of freight cars. This is perhaps so, and perhaps not; even if it is so, it would be small.

1414 (*f*) The greater time of use of the property by freight trains, because of slower speed. This is not so.

(*g*) Greater wear on tracks, both in the straight and on curves, attributable to more rigid freight train trucks. This is true, and weights the freight side, but does not amount to much, as on South Shore the proportion of straight line to curves is very much in excess; there is very little of what I term heavy curvature line, and long pieces of straight line.

(*h*) Greater number of derailments and injuries to track, ties, etc., in freight service. This weights the freight side, but I do not think it cuts a big figure.

(*i*) The difference in locomotive types in passenger and freight. I did not pay much attention to engines, except the heavier ones going on to the line since June 30, 1913, numbers 552, 553 and 554.

(*j*) The carrying of persons free by passenger trains, for both classes of service. (Previously answered at length.)

(*k*) The hauling of business and private cars by passenger trains. This weights the freight side, but it is very little on this road.

(*m*) The exclusive use by the freight traffic of large amounts of mileage of line, side tracks and spurs not used by the passenger traffic. This weights the freight side, but is small.

(*n*) The greater use of yards and terminals by the freight traffic in switching. This weights the freight side, but is small. In many cases, if not wholly, you can allocate those sidetracks in terminals and yards to the freight or passenger service using them, and what you cannot allocate would be very small.

(*o*) Double and triple tracking for the necessities of freight service. That applies to both; you do not increase your facil-

1415 ities until the demands of both require.

(*p*) The use of main tracks in freight service, in switching, in greater proportion than in passenger service. This weights the freight side, but doesn't amount to much; it is almost wholly confined to the use of a local freight train.

(*q*) The more frequent starting and stopping of freight trains, in road switching. This weights the freight side, but I do not think it cuts much figure.

(*r*) Switching done by road locomotives, not represented by train mileage nor by switching mileage until one hour is reached. This is an accounting proposition, and, as I remember, only a question of overtime.

(*s*) I think this is an accounting proposition, wholly.

(*t*) I know nothing about this.

(*u*) Greater length of passing tracks to be maintained for freight. This claim, I think, is so, in a measure; at best, it is not a big item.

(*v*) Greater cost of main line due to frequent presence of switches

for freight switching. This is true, and weights freight side, but is small.

(*w, x*) Greater number and cost of switches for freight. This is true and weights freight side, but is small.

(*y*) Higher center of gravity of freight cars, particularly ore. (Previously covered.)

(*z*) Greater movement of freight cars in stational work and switching. This adds to the freight expense.

(*aa*) The greater damage from freight, caused by greater number of flat spots on wheels. This is not true, as speed must be taken into consideration.

(*bb*) Greater injury due to reciprocating motion of freight engine sideways, varying with tractive effort, and greater at
1416 slow speeds. This is not true.

He (Thompson) says it is his opinion that the freight train revenue mile is more expensive to produce on this road than the passenger train revenue mile. I doubt it very much. He says he thinks it is considerably more than twice as expensive to produce the freight revenue train mile as the passenger revenue train mile. I don't believe that.

(The elements or considerations which are claimed to add to the cost of the passenger train mile and make it as expensive as the freight train mile are stated, and the witness asked his judgment with reference to correctness.) I think the statements are correct; they are of considerable importance.

Taking Mr. Thompson's alphabetical list of reasons to overcome excess speed in passenger while making the freight train mile more expensive, and eliminating (*a*) tonnage, (*m*) exclusive freight trackage, and (*n*) use of side tracks at terminals, and weighing against them plaintiff's seven items, some of them being important and some minor, I would say, without having any direct figures about it, that the value of the seven items of plaintiff's would be 60% to 75% as much as the remaining 25 of the 28 Thompson's alphabet items; i. e., if the value of Thompson's 25 items were $1,000, the value of the seven items would be $600 or $750.

My testimony yesterday was that, eliminating the first of Thompson's alphabetical reasons (tonnage), the remaining 27 items were more than offset by the cost of transportation of company material in revenue freight trains; the seven items listed are 75% of the remaining items listed by Thompson. That leaves out the weight on the freight side and the speed on the passenger side, and all other things.

The causes of depreciation on a railroad are wear, decay, obsolescence and inadequacy.

1417 Referring to Thompson's testimony, that passenger speeds average 27 miles and freight speeds average 16 miles per hour, and that the excess wear due to speed alone is probably not over 15%, it is my opinion that it would be very nearly twice 15%. I am taking into consideration that the train weights are the same. Speed increases stress and wear, and requires greater strength, stability and fitness of track and track structure, other things remaining the same.

It is true, in a measure, that the dynamic augment is the increase

of weight on track, due, in large part, primarily to imperfect counterbalancing of the main and side rods of the locomotive, rather than the movement per se; but, bad track is also a very strong feature, though not so great as the effect of badly counterbalanced wheels. There is nearly always bad counterbalancing of wheels.

(The statement from the Buhl case, Vol. 1, page 427, to the effect that locomotive mileage is responsible for one-half the wear and tear of track—with which Mr. Thompson disagreed—and the statement that the cost of maintenance, depending on traffic, should be divided between the different departments of service on the basis of locomotive mileage, switching included,—which Thompson agreed would be a more correct basis than with switching excluded,—read to the witness.) I don't believe locomotive mileage plus switching is right. Switching engines very seldom, if ever, go out of the yard, where they operate on many tracks. That maintenance charge is light, and it would be very difficult to get switching engine mileage. The locomotive mileage would not be a good factor, because it does not consider weight nor speed. I have never considered that as large a ratio, as one-half the wear should be due to the locomotive; it would be different for passenger or freight and freight engine.

1418 The engine effect might be, as to the locomotive tonnage including tender, multiplied by, for passenger, 4, and for freight, 2; that would represent my opinion of the relative destructive effect of locomotives on track and track structure.

Referring to Thompson's statement of the meaning of critical speed as being the point where the injury due to speed begins to decrease, as to whether that is the true meaning of the term, I do not believe it, and I think his statements incorrect.

The formula for impact for bridge work is: Impact is equal to static load plus 300, into 300, divided by 300, plus L, which represents length of span in feet. I am familiar with the report of the sub-committee of the American Railway Engineering Ass'n printed in the 1911 proceedings, volume 12, part 3. The formula there proposed by the sub-committee gives the maximum impact, takes into consideration varying speeds, poor conditions of wheels, the cars and engines, had counterbalancing, poor track conditions, and all other conditions of minimum character. The average passenger train speed of 27 miles per hour on this road would be within the limits of critical speed, and would produce greater cumulative vibration and impact than the same engine on a freight train at 16 miles an hour, assuming engines, cars and track in good condition.

If all the conditions were such as you describe—everything perfect—there would be no impact. On this road, with a single span of 150 feet, which is shorter than the shortest passenger train, a passenger train at a speed of 27 miles per hour, as compared with the same engine hauling a freight train at 16 miles per hour, the critical speed would not be reached in the case of the freight train, and I would, therefore, say that the greater cumulative vibration and impact would be produced by the passenger train. I think I know a formula that would be better than Thompson's for division of un-

1419 allocatable expenses between passenger and freight. It is: Take the weight of a passenger engine and multiply it by

4; take the weight of a freight engine and multiply it by 2; take the weight and contents of a passenger train and multiply it by 2; take the tonnage of the cars behind the locomotive and tender, in other words, the cars and contents, and multiply it by one. That takes into consideration all the elements that I believe should be considered. I have never had occasion to use it since I thought it a good formula. I cannot say anybody has used it.

BERRY.

Cross-examination.

By Mr. Wykes:

This formula is known as the "equivalent ton mile formula," and is found in 1912 report of American Railway Engineering and Maintenance of Way Association. I think it proper for general application, and approve it thoroughly. It would be applicable alike to the Michigan Central, New York Central or Pennsylvania.

On a 150 foot span bridge, a 27 mile passenger speed would be between the two extremes of critical speed, which the tests show are between 25 and 40 miles per hour. On the 150 foot span, the critical speed would be reached, but, in the case of freight trains at 16 miles an hour, the critical speed would not be reached. I do not think that on a 150 foot span the critical speed is reached at less than 25 miles an hour; occasionally, a case has developed that it does. The damage would begin to run off, inversely, as you begin to run up from 25 miles an hour; I think there is nothing appreciable to 27 miles. When you have reached the critical speed for that span, the cumulative vibration would drop off. I do not know what the critical speed would be on this particular length of span. I do not
1420 think it might be 22 miles an hour; the tests all show that it seldom occurs below 25 miles an hour.

I approve of the larger part of the findings of the sub-committee of the Railway Engineering Assn., from which I quoted yesterday. Those investigations were made for the purpose of determining the truth, and not for any particular case, but for the purpose of laying down general rules as near as they could be ascertained. In saying critical speed begins at 25 miles an hour, I am assuming normal conditions of track, and not everything in good order; it is hardly ever in first class order, nor is the engine ever in first class order. If everything is in perfect order, there is no impact. If there were no imperfection in counterbalancing, no deflection of the bridge, if the ties were long enough, if there were no flat wheels, no low joints and the track was well maintained, there would be practically no impact. The roadbed of a railway is elastic—more so than a bridge.

I have never in any other case testified to rules for the division of costs. In Oklahoma and Texas cases, previously described, and to be begun, the division of costs were not made on the equivalent ton mile ratio. In those cases, they are trying to divide the costs by several alternative methods, applying the different methods to the subject as a whole; one of their bases is the speed ton miles, taking

the weight of the train and multiplying it by the speed between stations; also the revenue train miles; also cost accounting; also gross ton miles; it being the purpose to show the results by each method.

In Minnesota Rate Case, where I testified, I applied, as a proper cost for legal expenses, $50 per mile of line. For organization, administration and general expenses, I applied $100 per mile of line. In Minnesota Rate Case, I fixed 30¢ per cubic yard for earth work grading, and testified that 10¢ of that price was added as contractor's profit; 20¢ was the contractor's price, and 10¢ was added for contractor's profit; I fixed for solid rock $1.10 per cubic yard,
1421 and 10¢ of that price was added for contractor's profit. For interest during construction, I made a deduction of 2% of the interest rate, due to earnings from partial operation.

In my testimony in this case, I had before me a list of the questions. Questions that were asked me were substantially in my hands as a list of questions, and I had memoranda on the margin of my thoughts in regard to the matter; I arrived in Marquette on the 8th, at 5 o'clock, and have been here to present time (16th).

The trip over the line consumed less than four days. From the time I arrived in Marquette, I have been in conference with Mr. Eldredge; at various conferences, Messrs. Tracy and Cotton, and, for 15 minutes, Lindsey, were present.

I would not use the method brought forth by Mr. Lindsey, because I know of a better plan. I would not say that I would approve of it if I did not know of a better plan, because I would have to carefully consider its merits; it would require a very careful investigation on my part. There are several others I think better. I have not passed any opinion on whether Mr. Lindsey had the wrong formula. I heard his formula stated. I think the formula I gave for impact more correct. I should hesitate to use M. V. squared for impact formula on track before I had carefully gone into it. If I were to throw a ball against the wall, I would determine the impact against the wall by M. V. squared, modified, of course, to allow for the elasticity of the object thrown. If I were to roll a ball on the floor, after making the modification for elasticity, the impact on the wall would be measured by the M. V. squared, but the impact on the floor would not be measured by that formula.

The only curves I measured were those I listed, being 18
1422 in Michigan; different elevations on the same curve were taken at various points.

I reached the conclusion of a high degree of maintenance for South Shore. My investigation relates only to the period at which I made it, and is not expressive of any previous condition.

I was not told that the expenditures for maintenance went up very materially in 1913 over 1912, and in 1912 over previous years. I was furnished the figure for maintenance of way per mile for one year, of $896. I was informed that the average, for a period of five years, from 1908 to 1912, of expenditures for maintenance of way and structures was $892 per mile. I do not know what trackage that included. I did not ask what was treated as main line, but all reports are on the basis of considering double and triple track as main line.

I was not given a comparison of maintenance by division, and no figures to indicate actual rail replacements on curves.

Chart, Complt.'s Ex. 95, Berry, passenger train speeds, St. Ignace to Marquette, is based on running time consumed between two points without stops. If a freight train trip, St. Ignace to Marquette, were platted in the same way, it would show like waves as chart 95, but I don't think it would show as high speeds. I do not understand that the freight trains are allowed to run at that rate of speed. To determine the actual speed of a certain freight train at a certain point, it would be necessary to get the data for platting a similar curve.

If you took only elapsed time between stations, the heights of speed to which the freight train rose would not be shown. Assuming three times the tonnage in a freight train as in a passenger train, with the same type of locomotive, it would take it considerably longer to stop than a passenger train.

I do not know the number of curves, the average degree of curvature, or the average of elevation on the outer rail of all the
1423 curves of the South Shore; the proportion of curve to tangent is small. I think the largest number would be two degrees or less, and that there are more curves of two degrees or less than of any other degree. In order to tell the amount of track damage due to curve elevation, it would be necessary to have a history of each curve, including the degree of curvature and the elevation of the outer rail.

On curves, if there were no elevation, you would still have centrifugal force to overcome, and nosing of the trucks; it would be aggravated by having no elevation, if there was any speed to it. Even if the elevation were fitted to the needs of the train moving around the curve, the movement would cause more wear there than on tangent, the amount depending on degree of curvature; any degree of curvature involves more wear than on tangent.

On some portions of South Shore the joints were well maintained, and on others they were not; in general, they were well maintained. They were not so well maintained on the lighter, 60 pound, rail, west of Nestoria, laid in 1887 and 1888. The joints were out of surface on the Western Division, and loads passing over those joints cause vibration, increasing with speed. Where the joints were out of surface, there would be some vibration, even from a train moving 20 miles an hour; that vibration increases the expense of maintenance, in that it aggravates the condition so that it becomes necessary to restore it to good surface. This increases expense of maintenance on both roadway and equipment; the latter to a minor degree.

From a timber bridge on South Shore I would not hesitate to get 20% or 25% longer life if used exclusively for freight than if used for freight and passenger. Even for freight service, I would not permit a bridge to go below 50% condition; 50% would be a pretty low percentage for a bridge, even for freight service. When
1424 I said that if South Shore were engaged in freight service only I might save 25%, my percentage applied to all items appearing in maintenance of way and structures.

The purposes of ballast are for drainage, to give elasticity, to give better surface, and to permit the track to be gotten into line or surface more quickly. If you had only freight service, you would want your road so you could get it into condition as quickly and easily as possible; that would apply, whether you had passenger service or not, but in a less measure for exclusive freight. The track is not thrown out of line or surface by the slower freight train, as compared with the faster passenger train. With only freight service, I would take more chances on the track being soft than with freight and passenger.

I do not believe I can differentiate so carefully as to say which affects track maintenance the greater—tonnage or speed; they act together and affect it; one acts upon the other. It would be difficult to state what importance you would give to the tonnage or to the speed part of the combination, in exact figures. I know of no way of doing it by figures, and never heard of any one attempting it. (Witness asked whether he would disagree with other witnesses who had stated that the speed alone was not sufficient to overcome the excess wear of greater tonnage on the freight side.) I would not attempt to differentiate between the two. I am offering no criticism of their opinion.

I saw the gross ton miles, both passenger and freight, but those did not enter into my conclusions, except to be used as a matter of comparison between what results might be produced by several formulas.

Years ago, I conducted a series of tests for bridge deflection, but not with the fine instruments now used; of recent years, I have not personally conducted any of these experiments.

1425 I have made no tests of track to determine the effect of speed upon it. I know of the methods others used, but whether they produced accurate results, I do not know.

On South Shore, assuming only freight service, I think I would get an average life of 7 or 8 years for tamarack and hemlock ties; I think I could use them in more rotten condition for freight than passenger. On trip over South Shore, I noticed a good many ties cut by rail; the hemlock and tamarack ties were cut somewhat, but the cedar much more. I saw many hemlock ties taken up that for freight service alone could be worn longer; they could have been worn longer for either service. I got the number of tie renewals for the current calendar year, 1914. The number contracted for was 333,000 for the whole road, and 290,000 for Michigan. I figured that into the gross number of ties, to find the cycle of renewal. I took it that the South Shore had from 35% to 40% of its main track mileage and siding, and perhaps a little more, on account of its ore tracks, and, put together in that way, I thought the renewals per mile were fair.

I would apply the equivalent ton mile ratio to the division of weather costs.

On my basis of equivalent ton miles, I apply the same rule to weather as to mechanical wear costs; that depends on the volume of tonnage, and is varied by the volume of locomotive tonnage. For fences, the general weather costs and erosion do not decrease or increase faster or slower because of increased or decreased tonnage, nor in porportion in which the tonnage increases or decreases. There is

no basis, to my knowledge, upon which the weather costs can be divided which reflects anything that varies with the weather cost. I came here with the idea pretty well fixed in my mind that
1426 the equivalent ton mile basis was proper. Mr. Howard and I came here with no other desire than to give the best we had, and advise our clients of what that was. We both believe in the equated ton mileage, having investigated it thoroughly.

In applying the equivalent ton mile basis, the closer you get to the division in which the expenses occur, the more accurate the result becomes. By applying it by zones, you would get different results for the different zones. I don't think you could figure it down as fine as to take it by each mile. I am speaking of the difficulty of getting at the data. If we could get at it by each mile, we might get different results for each mile of the road. I doubt very much whether, in that way, you would get a different aggregate result from what we get by applying the rule in bulk, and I have never worked it out to see, and have never worked it out by divisions.

The mileage of all trackage engaged in common service or in exclusive freight service was not given me; I did not understand anything was exclusive freight trackage, except a short piece, Negaunee to Winthrop Junction. No statement and no percentage was given me of the amount of time of freight trains engaged in stational service, or of the proportion of switching mileage in freight and in passenger service. I made no analysis of terminals to determine the proportion of use in freight or in passenger service. I made no investigation to ascertain the gross tonnage of company freight, though there is a way of doing it. It was not given to me .

In saying that the element of flat wheels in freight is perhaps trivial, or unimportant, I had in mind the excess number of wheels in freight over passenger service; taking into consideration those excess wheels in freight service, there would be many more flat spots in freight service. Whatever damage they did cause, except that added to passenger by reason of excessive speed, would be greater in freight than in passenger.

1427 In my judgment, the expense of getting a passenger train by a freight train should all be charged to the passenger. It is necessary for each to pass the other. If there were no passenger train, or if there were no freight train, we would not have the expense; the expense is there because we have both services, and it is as necessary to get one by the other as the other by the one. It is unnecessary to make a sidetrack as long as the longest freight to get it by the passenger; you could pass with a passing track sufficient to accom-odate the passenger train. I meant to intimate that the train taking the siding should bear none of the expense due to the taking of the siding, but that it should all be charged to the other traffic, in that the freight train had already had charged to it a good share of the expense of handling it in and out.

In case of a freight train passing a freight train, the expense should be charged to the train occupying the main line, as a matter of bookkeeping. Independently of the length of the sidetrack, the passing of the two trains, freight and passenger, is a benefit to each service. The whole thing should be charged to the passenger, simply

because the movement has been made for the benefit of the passenger train; also, the freight train, in taking and staying on the side track, has expense all charged to freight service, so it seems to me that the expense of going in there should be properly charged to the passenger train.

The Master Car Builders' rules permit wearing of wheels so that the coning entirely disappears before the wheel is taken out of service. On our railroads, we have many freight car wheels without coning.

I should say critical speed was that at which the train produces the greatest effect. It is the point at which the maximum effect is reached and the line begins to fall the other way. Critical speed is not of necessity maximum speed, but varies with the character of the structure and the length of the span. The longer the span, the lower the critical speed. My understanding is that the critical speed is seldom below 25 miles an hour. I have made no tests to determine the point at which it occurs. On tests with which I am familiar, critical speed at 25 miles an hour was indicated, and there were some cases below.

1428

There is no impact, or perceptible impact, made on track in good condition, that is due to speed alone, if the locomotive is in good order and properly counterbalanced, with no flat spots on wheels; this applied to a bridge; I did not apply it to a track. The reason for the difference is that you can measure the impact on a bridge, but it is very difficult to measure it on track. I did not mean to answer that there would be no impact if all of these conditions existed on track, but that it has not been proven to be true. The ground, when not frozen, is more elastic than a bridge.

Ballast is put on bridges, to guard against fire, and to make a continuous roadbed, so you can use track ties and get the same effect on the bridge that you do on a track elsewhere. A ballast deck floor on a metal bridge is to avoid the shock that occurs where you leave the roadbed and strike the pavement. It operates to reduce the impact. Where a bridge is in proper shape and ballasted, impact is greatly reduced.

Q. And that same reasoning could be applied to track, could it not, on the ground that, where it is well ballasted and the joints are well surfaced, the train conditions are such as to minimize the inequalities of flat spots and of imperfect counterbalances, that the impact disappears there also?

A. Yes.

Q. Assuming a straight track——

A. Hold on a minute. You have made an exception there to the conditions of the engine, haven't you, and cars?

Q. No, I said that they should be in good condition?

A. Then the answer is yes, as I gave it.

1429

Q. Eliminating, as much as possible, the impact from defects in the equipment?

A. That is all right.

Q. Assuming straight track, well maintained and in good condition, and eliminating all questions of curves, unbalanced drivers, depressed flat joints and flat or eccentric wheels, is it not true that

the higher rates of speed, say 40 miles and above, are less damage to track than lower speeds, say those below 40 miles per hour?

A. No sir.

Q. You wouldn't apply the same principles that you apply to a bridge there?

A. No sir.

Q. If not, where is the damage due to speed?

A. Because every time that engine, even with things in perfect condition, as you speak of, strikes the joints of the rail in the track, it has a tendency to drive that down that doesn't exist on a bridge at all; and, the higher the rate of speed, the more it hammers those joints down, which it can do on track and connot *due* on a bridge.

Q. Is that because you cannot have perfect counterbalancing?

A. No.

Q. And cannot have perfect wheels?

A. It is because on a bridge you have got something that will not depress.

Q. The reason it occurs on joints is because you cannot have perfect counterbalancing.

1430 A. No sir, it is simply because a joint is the weakest point in a track, and it is subject to being pounded down more than any other portion of the rail.

Q. But, other than the joints, there would be less damaging effect?

A. Oh, yes; you would at other points, on account of the ballast continually varying from day to day its condition by the wind, by water, by something of that kind, reduce the value of the support.

Sufficient ballast, good ties and rail, and proper expenditure for roadway and track, producing fairly even track and good track condition, operates to reduce the expense for maintenance of roadway and equipment due to low track joints and imperfect track, and to reduce impact thereby.

The Master: You would say it is better economy to keep a track in that condition than it is to get it in any poorer condition?

A. I would like to answer that in a Yankee fashion, if the Master doesn't object: They tell me that a fellow once said that he could buy the whole of Chicago for a dollar, but he didn't have a dollar. We sometimes regulate the good condition of our track by the size of our pocketbook. I know that has been the thing that has been pounded into me for a good many years.

The Master: In the instance which Mr. Wykes described, if you say yes to that, would it follow, from that, that it is more economical to keep the track in that condition than it is to keep it up in poorer condition?

A. I think so, too; I agree with you in that. I had a great deal rather have the money to keep it in fine shape all the time, taking into consideration the traffic that it is to carry; that is the economical way to do it, too.

1431 After we have applied these formulæ, we do not know how close to the truth we are, and there is no measure for telling, except comparatively. If on one road you have the figures for the revenue train mile, and use one or two other farmulas, taking into

consideration the elements you think are right, and they agree reasonably closely, I should say the formula that had the elements that cause mechanical wear is proper. The evolution of these formulæ from time to time depends upon judgment. That evolution has not proceeded to a point where we can say there is a consensus of opinion for the equivalent ton mile formula, or for any other, except that students of economics have been gradually sifting out those which they thought had no merit, and new ones have been springing up from time to time. One expert or railroad man selects one, and another selects another. As to whether each urges the one he is for with equal confidence, something else comes in there; some of these formulæ are selected by men who do not know what they are talking about. There are men, whose opinions I respect, who differ on the proper formula to be applied. The formula to be applied involves the judgment of the person applying it. That judgment goes to the question of whether it represents the propert elements on each side of the problem.

I think the revenue train mile basis has been more generally used, for some time back, than any other that I know of. The only bad feature about that is speed, and the locomotive; they have been trying to remedy that, in a recent formula, by using speed ton miles, but that does not cover the question of differences in locomotive effect. Everybody concedes that the effect of the locomotive on track is harder than the same tonnage of either freight or passenger cars. The revenue train mile basis also has the effect that it does not take into consideration tonnage. This is an easy formula to apply, which is one of the reasons for its repeated use.

1432 A passenger locomotive will do more than the same tonnage of passenger cars, and a freight locomotive will do more damage than the same tonnage of freight cars. We put the locomotives on an equated tonnage.

Every contract I have ever known between two railroad companies for trackage rights of one on the other has called the locomotive engine equal to two or three passenger cars, or three or four freight cars, in destructive effect.

(Stipulation that either party and the Court may use article from volume 12, part 3, proceedings of 12th Annual Convention of American Railway Engineering and Maintenance of Way Association.)

BERRY.

Redirect examination.

By Mr. Cotton:

Testimony has not been taken in the Oklahoma and Arkansas cases I referred to. A 50% value in bridges and trestles is not the same as 50% efficiency. A 50% value might be 80% efficiency. A 50% value represents the half way point between a new bridge and the scrap heap; it measures the time before you must put in a new bridge. A 50% value might represent a bridge you were going to

take out tomorrow, though that is an exaggerated statement, but the efficiency is not the value or a measure of the value, because efficiency is the safe bridge that will carry traffic without regard to value.

In my answers to State counsel's question, I understood him to ask me as to 50% of value. What Riggs said in his exhibit meant value, and had nothing to do with efficiency. When I answered counsel's question as to how long I would maintain or keep a bridge in 50% or 60% of condition, I had in mind efficiency.

1433 In my comparison, where I said the seven items or elements would represent 60% to 75% as much as the 25 items of the so-called Thompson alphabet, they being treated as 100%, I considered the sleepers and diners. I took Thompson's own estimate of that, as I now remember—$112,000 for transportation and $55,000 for operation, equalling $167,000. I had in mind, in addition to the value of those cars, that, if they were to be considered as a part of it, there was the interest on the investment.

BERRY.

Recross-examination.

By Mr. Wykes:

The several questions asked me on rebuttal were the subject of a conference between myself and the attorneys for plaintiff since my testimony this morning. Mr. Eldredge tried to indicate wherein I was wrong, and I explained to him wherein I was wrong.

1434 On July 17, 1914.

CHARLES P. HOWARD, a witness called by plaintiff.

Direct examination.

By Mr. Cotton:

I am 47 years of age. I live at Chicago; am a Consulting Civil Engineer. I have had about 30 years' experience in engineering.

I served for two years as a rodman, on construction, on Southern Railroad; one year as Assistant Resident Engineer of construction on Frisco lines; about a year as a levelman on surveying party; four or five years as Resident Engineer of construction on the Georgia, Carolina & Northern and Chesapeake & Ohio, involving construction of a bridge across Broad river, South Carolina, and Savannah river between South Carolina and Georgia. On Chesapeake & Ohio, I had charge of double track construction, as Resident Engineer; previously I was a resident engineer on the Nashville, Chattanooga & St. Louis, near Jackson, Tennessee. I laid 55 miles of track on that line, and maintained it until turned over to operating department.

I was chief of a party of the Darien Surveys of the Isthmian Canal Commission, surveys in the province of Darien, a hundred miles

east of the present Panama Canal. I was in the mining engineering business in West Virginia, making surveys and construction of inclines, tipples, etc. I was in charge of all engineering work and construction on the Deep Water Railway, as Assistant Engineer, in West Virginia, and the Tidewater Railway, as Engineer, in Virginia, about three years. On both these two railroads, we located a line from coal fields of West Virginia to Norfolk, had many locating parties at work, and constructed a good deal of the line in West Virginia.

I was Consulting Engineer at Pittsburgh. I made a joint report and reconnaisance with Mr. Kennedy, Consulting Engineer of the Wabash, on a proposed line, Wheeling, W. Va., to Connellsville, Pa.; and made a survey for the Wabash, contemplating a new
1435 entrance at Pittsburgh. I made a report on a proposed inter-urban railway, south of Pittsburgh. I was employed by the Lake Shore & Michigan Southern, for about three years, in charge of location, as Assistant Engineer of construction. After that, I was employed by the Illinois Central Railroad.

While on the Lake Shore, I was sole arbitrator of the value of 22 miles of the Pennsylvania Railroad east of Brookville, Pa., for joint operation. I made valuations for Lake Shore of short portions of the Baltimore & Ohio and Pennsylvania, which contemplated common use.

I was employed on reconnaisance and location of the Bangor & Aroostook Railroad, in Maine, and, later on, experience with Illinois Central, mentioned, as Locating Engineer for a line in Indiana and a line extending east from Jackson, Miss. I also made investigations into the economics of proposed grade and line changes on several divisions, two on the Illinois Central. I have since been occupied as a Consulting Engineer at Chicago, in which I have been engaged on one or two problems involving construction. I have had occasion to make special study of economics of railway location, for the last ten years.

I am a member of the American Society of Civil Engineers, Chicago Railway Engineering Assn., the Western Society of Engineers, Chicago Engineers Club, and, in the American Railway Engineering Assn., for a good many years I have been a member, and am now Vice Chairman, of the Committee of Economics of Railway Location. I am chairman of sub-committee number 2 of that committee, which is charged with the study of railway operation. I am also a member of another sub-committee, which is charged with the study of power of locomotive, with special reference to the improved efficiency due to the locomotive super-heater and the automatic stoker, and in other revisions of the Manual as to the power which
1436 may be deemed necessary.

I have contributed quite a number of articles to engineering magazines. I contributed an article to the Engineering News some years ago, tables and data for railway locating engineers, which has since been republished in pamphlet form; I have also contributed articles to the American Society of Civil Engineers on subject of location, and, in recent years especially, on subjects of valu-

ation. I wrote an article on curvature for the American Railway Engineering Association; I recently published a bulletin on Grade Reduction problems, and have written other articles for magazines.

I have, necessarily, had to give a good deal of attention to matters of track construction, and I have had to maintain track during the most trying period, immediately after it was laid, until it could be turned over to the construction department, and I have had to be constantly in touch with the maintenance of way departments at various times, constantly on and about the tracks of the railway, and, in connection with the Association, have also made special studies as to operating expenses, and, of recent years especially, in regard to the question of locomotive fuel consumption, speed, time, curvature, and divisions of maintenance of way expenses, which is one of the most difficult.

I have given special study to matters affecting railway operation, its effect on track, roadbed and track structures, bridges, trestles and other structures, the cost of such operation, and the amount and causes of expenses incurred in the different kinds of business conducted by railways, especially in the items enumerated, and, in a general way, as to the total expense of operation, so as to be able to correctly prophesy what the cost of operation would be on a new line.

I have never been a witness in a rate case, in litigation involving railway valuations or the cost of maintaining tracks and railway properties, or the cost of different tracks, or for any other
1437 purpose.

I heard Mr. Berry's testimony and his description of the trip over this railroad, referring to its physical condition and the inspection of track, curves, super-elevation, etc. Mr. Berry and I were together during those four days. I participated in all of the examinations referred to by him and assisted in measuring the curves and taking the passenger train time, St. Ignace to Marquette.

We found no outer rail elevation of 8 inches. We selected the curves and examined them from the profile, having in mind the sharpest curves, where we would expect to find the most elevation. We looked for curves of the highest elevation, and, had there been any of 8 inches, we would have found it. The results for curves and speed, as given by Mr. Berry, I would testify to as correct. I think the South Shore track, roadway and structures are in fair shape for the traffic it has.

(It was stated to witness that average speeds were, freight 16 miles, and passenger 27 miles, per hour, that passenger trains frequently, for shorter or longer distances, make 35 to 55, and occasionally, but infrequently, to 63 miles per hour, and that freight trains make occasionally, but infrequently, 25 to 35 miles per hour. He was then asked which service, per unit of weight, involves the greatest expense of maintenance of track, roadbed, and structures, both on curves and tangents, due to mechanical wear.) The greatest part of the mechanical wear, per ton, would be from the passenger trains, in my opinion, on account of the speed and the re-

quirements for better maintenance for passenger service. Generally, passenger service fixes the standard of maintenance, upkeep and efficiency. The effect on track is greater at greater speeds; as the track is never in perfect surface, and at high speeds the track blows are increased, it tends to have a worse effect on the track.

On the curves, we found considerable wear, at places, the wear being on both rails. That indicates that the wear on curves is considerably greater than on tangent; I noticed no special wear
1438 on tangents, except where I think rail had been taken from curves and put into tangent. We examined the rail, particularly on curves; I don't recall any particular examination on tangents.

If South Shore were used solely for freight traffic, I don't think it would have to be kept up as well as for both services, and it could be kept at a considerably lower standard. As to whether or not it is advisable to do that, there might be some difference; nobody knows exactly; but it is necessary for the passenger trains. The expense of maintaining it, if the passenger service were left out, would, in my judgment, be largely cut down. I could estimate that amount on equivalent ton mile basis; on that basis, if there were no passenger service on South Shore, the cost or expenses of maintenance of way, where the cost arises from mechanical wear, would be about one-half what it is now.

I read Mr. Thompson's testimony regarding the division of expenses of maintenance of way and structures resulting from mechanical wear between passenger and freight on Ratio 1, gross ton mile basis, and am familiar with it. I do not think such a ratio is proper or approximately accurate to be used in this case to divide common expenses, as it neglects the element of speed and the fact that higher speed passenger trains require better track, which are the reasons the equivalent ton mile formula was devised. That formula multiplies the passenger locomotive by four, the load back of it by two, the freight locomotive by two, and the load back of it by one, and the resulting quantities in each service produce the equivalent ton basis for the equivalent ton mile ratio. In my judgment, that ratio or basis is reasonably accurate for the division of expenses resulting from mechanical wear to way and structures.

1439 I have read Mr. Thompson's testimony respecting his Ratio 4, time, as a proper factor for the division of maintenance of way and structures expenses due to weather stress, decay or erosion. The same, in my judgment, is not proper or approximately accurate for this case, as the respective classes of trains occupy and require the reservations for their use of different stretches of track; and, if you take the larger portion of track occupied in that sense by the passenger trains and multiply them by it, you would get essentially different results from Mr. Thompson's, provided time theory were correct on any basis.

(Objection to strike out witness' answer because predicated on misunderstanding of Thompson's testimony, as Thompson does allow

for a suitable amount of track in his judgment, as required for the needs of the trains.)

If the passenger trains were slowed to the freight train speeds, with the same rights as now, they would still occupy the track in a more intensive way; they would then average the same use, in point of time, as the freight trains. I think Mr. Thompson referred to a section or block as being used by a train, and assumes that the same length of track was used by each train, passenger and freight.

I would not consider Thompson's Ratio 4 as proper or accurate for dividing maintenance of way and structures expenses beteween passenger and freight. I never heard of it before as a ratio for dividing expenses. I do not consider Thompson's Ratio 4 proper for use in dividing unallocatable property between passenger and freight services, for reasons already stated. That would not be accurate, even assuming his time basis correct in principle.

I do not know which would the more nearly accurately measure the division of common unallocatable expenses of maintenance of way and structures on this road, as between passenger and freight, the revenue train miles on the one side, or the gross ton mile and the time on the other side. I have never given any particular attention to the division of wear stress on railroads, for the reason that I have divided mechanical wear on equivalent ton miles and the weather stress according to the miles—so much per mile. I had no reason to divide between passenger and freight, and the only reason for doing that was to take into consideration the extra weight and speed, as to its effect on track. The equivalent ton mile basis I would use for dividing mechanical wear expense of maintenance of way and structures.

1440

Locomotives cause greater destructive effect on track, bridges and trestles, and passenger locomotives at higher speed cause greater destructive effect on track and track structures than freight locomotives at slow speed, if they are anywhere near the same weight. I have never observed the side motion of locomotives at slow speed, with heavy loads, causing stress on track and track structures, but if it exists, as it may, I do not think it important, as the blow would depend very much on the speed of application, and, as already mentioned in this case, all the cars behind the train would be going at slowest possible speed. In my opinion, the counterbalance on the locomotive is one of the most important features of damage, both to track and bridges; that is very important at high speeds. Thompson has not taken into account this higher speed effect on imperfect counterbalancing; I never heard of perfect counterbalancing, and my information is it cannot be done. Counterbalancing for a certain speed may be approximately correct, but, when you go beyond that speed, the unbalanced force becomes very destructive.

The causes of depreciation are wear, decay, obsolescence and inadequacy.

1441

It is the consensus of opinion among civil engineers that speed increases stress and wear, and requires for track and

track structures greater strength, stability and fitness, other things remaining the same.

A rail has an elastic element; every element has an elastic limit. But, in general, you don't speak of the elastic limit of a track being reached; at least, I don't think it is ever used in that way. He (Thompson) might mean that, when a track got dangerous, of course, it doesn't make any particular difference, the exact terms you use, provided you get the sense.

(Witness' attention called to quotation from Buhl case, where it was said that Woodlock and others held that that part of the cost of maintenance depending on traffic should be apportioned between different departments of the service based on locomotive mileage, switching included, and that many others held that the locomotive mileage alone is responsible for at least one-half the wear and tear of track, with which Thompson disagreed, and his judgment was asked about the paragraph.) Nobody knows exactly how much greater the locomotive effect is; as a matter of fact, it would vary with different locomotives and cars. But, it must be remembered that, when Wellington wrote that, both locomotives and cars were considerably lighter than now.

In the equivalent ton mile formula, the locomotive has been given double the weight, as being as near an approximation as we could get with our present knowledge of the subject. I have recently had sent me an elaborate blue print, in an effort to divide costs, which took a locomotive as weighing three times as much as the load behind it, but it is not possible, at this time, to make very narrow distinctions, and, of course, by assuming the locomotive as more than twice the equivalent of a given weight of cars, it would accentuate the difference between that and the gross ton mile formula.

1442 Wellington's book, which contained the statement quoted by Thompson, was written 25 years ago, and the last revision was 10 or 15 years ago. The statement of Thompson, that the critical speed is the speed at which the injury begins to decrease, is true. There is nothing in Thompson's statement that "in the case of very high speed trains, the injury to the rail joint is less than in the case of lower speed trains."

If the track were absolutely straight and level, and smooth, and there were no irregularities whatever, and if the locomotive and the cars had no unbalanced portion, so that there would be a smooth, uniform speed, just as if a perfectly adjusted machine were gliding on greased rails, why then, as I understand it, both by tests and by theory, there would be no jolt or jar, whatever, and there would be no effect of impact, going on a bridge. There would be just that due to the absolute weight; but, as a matter of fact, that is never attained under any conditions. In bridges, it can be attained, to a certain extent, where the track is good, and especially where they have a slight camber or bend in the track, so that, when a train gets on it, its weight presses that down and makes it more nearly level; that can be attained, to a certain extent, but the effect on track, of course, is a question of irregularities and blows, occasioned, not only by the roughness in the track, but by the counterbalance in the locomotive,

and blows of the wheels of the cars on these different low and high spots. One of the common track defects is low joints, and practically every track has some low joints.

On a single bridge span of 150 feet, a passenger train at 27 miles an hour would cause greater cumulative vibration and greater impact than a freight train at 16 miles an hour. A passenger engine might reach the critical speed at 40 miles per hour; a freight train could not by any possibility reach the critical speed. The impacts due to counterbalancing are practically none, up to 12 miles an hour, and very low for speeds of 16 miles.

1443 I have already given you the fact that the jar produced by a heavy freight car was not very great under about 40 miles per hour.

HOWARD.

Cross-examination.

By Mr. Wykes:

I am practically a partner of Mr. Berry's. I heard practically all his testimony. I am familiar with practically all of it. Mr. Berry testified to some things I do not know about. I have no specific criticism of Mr. Berry's testimony upon the subjects regarding which he testified. The information received by Mr. Berry and myself from company officials was received together, usually, so I had the same information he had. I asked questions whenever I thought it useful. Anybody that could tell me anything, I asked them questions which I thought pertinent to the inquiry.

I think you could cut the expense on the South Shore by taking off the passenger service. To say what expense would be left would be a guess, and involve my making an estimate on the whole cost of operation in each service. I do not know whether it would be 5% or 50%, and it would be simply a guess; it would be as much so as for me to give you my idea as to the relative expense of all the passenger and freight service on this line.

Limited to the expenses of maintenance, I do not really know; it is just simply a wild guess. I would have to guess on the basis of train miles; the mechanical wear portion that I have examined would be too small a proportion of the service. It would be the merest hearsay, based on statistics of what different roads cost per mile for freight and passenger, and they do not give those statistics. Sometimes I have taken the average cost per mile on a railroad as representing something like the ratio, and again I have taken it higher for freight service.

1444 Our examination of South Shore related solely to 1914 and the conditions at that time, and not to any previous time. I do not know the condition of the property in previous years, and did not investigate the expenditures of 1913 and previous years. The extent of perfection in which a railroad would be maintained would depend upon the speeds made. If, in a particular year or through a series of years, the expense went up very much above the average of

previous years, one reason might be that speeds had increased, or another might be increase in tonnage, prices or increased expenditures. If the speeds were increased materially, I think it would show an increase in cost of maintenance.

Bridges are usually designed for tonnage. If I were building a railroad today, and providing for new bridges, I would take into consideration the needs of 20 years in advance, providing for the prevailing type of locomotives, and also for changes in weight and conditions of locomotives, as indicated by practice of other important roads. I understand the South Shore's new bridges are Cooper's E 50 loading, which, it is maintained by some, are good enough for any locomotive that is likely to occur; it will take care of the stresses that the future gives evidence of. I believe the greater number of steel bridges have been taken out because of increase in loading. I examined but one wooden bridge particularly.

I know nothing about the annual expenditures of the South Shore on its bridges. I saw one figure of the annual expenses in one year, but could not say whether it was $1,500,000 or $2,500,000. I know nothing about the expenditures of the South Shore for bridges that would be due to speed, or the part due to passenger traffic. If it were a question between speed of 35 and of 60 and 65 miles an hour, I think you could cut in half the allowance for impact, and that allowance for impact would cut the live load on which you would base the weight of a bridge about 23%, and that would mean a
1445 saving in cost of 10% or 15% on a steel structure, because the weight could be made less if you were certain that those speeds would not be exceeded.

I did not mean that I would favor building bridges for exactly that traffic, for people might want to own a road, good not only for immediate purposes, and which they could dispose of. Assuming we were going to devote the South Shore exclusively to freight business, and I was called upon to replace these wooden trestles and provide for the needs of today, and for a good railroading and the needs of the future, I would put in E 50 bridges, which is a good bridge and good practice. That is South Shore standard.

It was not indicated to me what amount the South Shore was spending for ballasting or ties; I do not know what the expenditures for ties or track laying or surfacing for the past 5 or any one of the past 5 years has been.

I saw equivalent ton mile formula before it came out in American Society report, as I was a member of the committee formulating it. I don't think it had been studied more than a year previous to the report; that is, I do not think there had been any specific study applied to make any formula, unless it might have been in the minds of some of the members of the committee before that time. The members' experience extended over the time of their acquaintance with railroads. I think these tests made for bridges apply, in a great measure, to track; I don't know of those being considered by anybody. I did not consider them in my work on the formula.

I do not know what particular railroad is mentioned in the report; I do not believe I signed it, but I was a party, and agreed, to it. The

association has not adopted it. I do not know that any railroad has adopted it, or of its use in any rate case. It was up for discussion before the Association. When a report is presented in an an-
1446 nual convention, they generally discuss it; generally, they do not adopt a whole report, but, if they see fit, they adopt general conclusions. The conclusion presented in the report of the committee may be adopted, or it may be modified and adopted. I think there was a motion to adopt the equivalent ton mile formula. The question came before the Association as to whether it should be adopted or not, and they didn't adopt it. I think Mr. Lindsey participated in the discussion, and was against the adoption of the formula.

Where I applied it, I was not interested in what the division between passenger and freight expenses was. I never used the equivalent ton mile ratio for weather stress items. I would not approve of it for weather stress items, unless I had investigated to see some reason why it would apply. It was intended to take care of that. I did not approve of it for the division of property between the two services.

I cannot tell you which character of depreciation is the most important, wear, decay, obsolescence or inadequacy. The depreciation due to inadequacy would, I think, in some respects, be very considerable; e. g., wooden bridges, ballast and steel bridges. In general, the life of a wooden bridge or trestle is 8 to 10 years, depending on the climate and the timber used.

The term "critical speed" is not applied to track. Track, you might say, is composed of a number of short spans, 2 to 4 feet apart; if the critical speed is not reached on spans of 50 or 70 feet, it would not be reached on spans of 2 to 4 feet. I believe, in general, the critical speed on track is when the locomotive jumps the track.

I know of no way of measuring the effect of speed on track, except the tests of the recent report of impact on bridges, and I think that largely applies to track. The counterbalance of the loco-
1447 motives produces an effect which increases with speed, and, as I told you sometime ago, the two locomotives in that report (American Railway Engineering Association, upon equivalent ton mile formula) show about 60% increase in the static load, due to dynamic augment. With the variety of different kinds and types of locomotives, and of different weights of cars and loads, it is difficult to say what effect should be attributed to speed and tonnage. I think, possibly, the ranges within which it would fall could be obtained. At speeds below 10, 12 or 15 miles an hour, the speed would cut little figure; I do not know how much; I know no way of calculating it. I think it is largely the result of experience and judgment based on experience. The amount of damage done by speed depends on the conditions of perfection of track.

The conditions of counterbalancing and the method of construction of equipment all enter into it, as well as the intention to have the equipment in good order, the amount of flat spots, and many kindred items. If everything were in ideal condition, and there were perfect surface and no low joints, you could get rid of that locomotive counterbalancing, and there would not be any danger. If

everything was in ideal condition, there would not be any impact from speed alone, except on grades and curves. Theoretically, there would be no increase in weight due to the dynamic augment. One of the reasons you can never get those ideal conditions is because there is always some give in a track and the ballast is never perfect. One purpose of the ballast is to evenly distribute the weight, and that is the reason why on high speed railroads you put in more ballast and put your track in better condition, and try to approach ideal conditions. It takes money to keep it up.

I did not consider the results of much value, because the amount of ballasting in the statistical figures would vary from year to year.

1448 The ballasting would fluctuate with the conditions of the ground, and the comparison was based upon expenditures, with nothing to indicate the character of ballast or the costs of different kinds of ballast, which vary.

I do not know how closely the equivalent ton mile basis would come to expressing actual conditions. My judgment is that it is a fairly accurate measure,—the most accurate that I know of,—but I do not know the limits of accuracy or error, and I do not know any one who does. The equivalent ton mile basis was recommended by the committee for general application; I do not remember any exceptions. I would apply it to the South Shore, but don't know as I would apply it to the New York Central.

I have a statement here, taken from Mr. Thompson's report, giving the locomotive weights in both services. The only way I could get the ton mile average would be to divide by the train miles. I did not do that, either for passenger or freight; that would not affect the formula, because the total weights would be multiplied by the same thing.

HOWARD.

Redirect examination.

By Mr. Cotton:

I do not know whether the equivalent ton mile formula was rejected by the Association, or that it was referred back to the committee; the committee this year is charged and directed to investigate the subject.

HOWARD.

Recross-examination.

By Mr. Wykes:

I do not know whether the committee is especially considering the equivalent ton mile formula now or not; it is considering all the information it can get on the subject, and, if the information

1449 checks that formula, it would be the formula selected. The general investigation is to determine the relative cost of passenger service, as it affects maintenance of way expenses. The report may not be a formula; it might be a method.

1450 On July 20, 1914.

WAYLAND W. WALKER, a witness called by plaintiff.

Direct examination.

By Mr. Cotton:

I am 46 years of age. I live at Duluth, and am Vice President and General Manager of plaintiff, having exclusive charge of the departments of operation, traffic, maintenance, and construction. I have been connected with plaintiff since 1890, (1900) as Traveling, Assistant General, and General, Freight Agent, and as Vice President and General Manager, having during that time given my time and attention exclusively to its service and its railroad. Have been Vice President and General Manager since December 1, 1911, since which time all construction, operation, maintenance and traffic has been under my direction. I have been in railroad business 30 years; with Grand Trunk, Great Northern, and Sioux City & Northern, up to 1900.

In my judgment it costs South Shore 20% to 30% more to keep its railroad in condition to operate passenger trains over it than it would if we operated freight trains exclusively, as we must provide for better track in all features, such as ties, rails, ballast and alignment, to provide for faster time of trains necessary for passenger traffic. If we had only our present freight traffic and service to maintain, the operating expenses would be between 20% and 30% less—nearer 30% than 20%.

The South Shore water front at Houghton has been used in the past and is now usable. It is necessary for the uses of the company, taking into account the possibilities of immediate use and the future; we hope to be able to use it soon. We expect to get in people to handle stone over it from quarries on Portage Lake; negotiations are now pending. I consider this water front very necessary, and wouldn't want to sell it. In the past, it has been used for handling trap rock from the mines, used in crib work for the canals, largely; part of the trestle is left on it.

1451 South Shore has had sleepers all the time I have been here. Diners were put on after I came; before then, meals were served at lunch counters, at different points, and by Wagner cars. It was then the practice to stop the trains to permit passengers to eat. We have had diners about 15 years. Sleeper and diner services are, in my judgment, a necessary part of passenger service; the people have come to regard those as a necessity, and the railroad not furnishing them cannot expect to enjoy traffic, except between points where people have to travel over that railroad. The people in Michigan use the sleepers and diners largely. I would say they are necessary for passenger service wholly in Michigan and serious loss of business would result from abandoning them—I should say 50 per cent.

People travel because of the facilities they find; passenger business has been built up largely on that service. An example is the

considerable traffic we have between Copper Country and Lower Peninsula, and that, Houghton to Chicago, of solid steel passenger trains with diners. If we did not furnish sleeping and dining accommodations, via Mackinaw, we couldn't expect any first class business. The Copper Country situation is governed by competition with the Copper Range and C. M. & St. P. On business between Soo and points east, and Duluth and points west, we couldn't expect any first class business if we took off sleepers and diners. No doubt, the same would be true as to business between Detroit and Houghton and other points, and Marquette and others, in Michigan; we would lose a big percentage of that business. That would be true for passengers whose destination was points in Upper Peninsula.

The passenger rates and business are competitive in the whole state of Michigan. From Duluth, we have competition to every point of importance on our railroad. Through service by boat increases in efficiency every year; they are active competitors for all our business from Duluth to water points, and also to our short points out of these water points; e. g., boats leaving
1452 Duluth, stopping at Houghton, carry many passengers for such points as Baraga, L'Anse, and places where the boats don't touch. Many people go from Duluth to Marquette and use our short roads to Ishpeming and Negaunee and other centers of importance. Marquette is competitive with water and also with the all rail lines from Chicago. The line, Duluth to Soo, is competitive, not only with water, but with the Soo Line, whose railroad is from Duluth to Soo, on which they make as good time as ours. We are subject to water competition five or six months of the year. These competitive conditions apply in a more exaggerated way for freight, as the boat lines do freight business for about eight months.

Every community of any size on the railroad is either located on, or competitive by, water. The same is true of other communities in respect of rail lines. Between Duluth and Soo, our line is crossed by 16 railroads. That is nearly always a disadvantage, as we are forced to surrender our business on the short haul very often, where we could get a long haul if the railroad were not so near. We get a benefit in return for that in some cases, but it is negligible. I don't think any railroad can get any rate they want; other elements than competition enter in.

Ore is our heaviest commodity, 5-year average being 41.7% of the tonnage. This is competitive with other lines; some ore goes to Newberry, but this is competitive in the sense that that furnace must have a corresponding rate with furnaces located elsewhere, to enable them to sell at a profit.

Stone, sand and other line commodities produced 9.36 per cent of the tonnage in 1913; it consists nearly all of limestone from Fiborn, Michigan. This is sold at Soo, Ont., Duluth, Superior, and the Copper Country, and the rate is governed entirely by the commercial competition of other limestone producing points. This exists in Michigan, principally at Alpena, where U. S. Steel cor-
1453 poration receives great quantities of limestone. We have tried to increase this rate, but it seems, if we did increase, it would result in shutting down the property.

Grain and flour produce 2.91% of the tonnage; they originate at Minnesota and Wisconsin points, seeking a market east, via Soo and Mackinaw, making it competitive with the lines through Chicago, Milwaukee and Manistique. We are no factors in the making of these rates; the basis is really established by water competition. An arbitrary rate above the water rate basis is made by the conference of lines. On grain and flour to Iron and Copper Country, we are subject to competition both by rail and water.

Bituminous coal, 6.18% of our tonnage, is largely handled through Marquette to mines about Ishpeming and Negaunee; the rates are made to compete with shipments through Escanaba and Gladstone. An advance cannot be secured, unless an advance is made from the ports mentioned. This coal originates outside Michigan, is under I. C. C. jurisdiction, and we can get no advance on that or other rates except by its consent.

Iron, 1.39% of our tonnage, is largely pig iron from Newberry, and rates are produced by commercial competitive conditions, and, to allow the furnace to operate, it is necessary to make very low rates.

Rates on other commodities making up the balance of our tonnage consist of tonnage destined to such points as Soo, Marquette, Ishpeming, Negaunee, Houghton, and points north, Duluth and Superior; these are highly competitive with rail and water rates, the rates from Mackinaw City and Soo to Duluth being the maximum that can be exacted from intermediate points. These rates are produced by the lines operating through Chicago to the head of the lakes, and this railroad cannot advance them except when a uniform advance is made by all lines involved.

1454 On copper, we enjoy the haul only during closed season; when navigation is open, it all goes by boat, the rates for which are one-half ours.

Our natural resources are minerals and forest products. Other railroads reach the mines from which we get ore, and a great deal of it goes by other lines. It is problematical whether we will keep that business or not. We get copper shipments for four months. For fiscal year 1913, lumber and forest products was 28.79% of our tonnage; that business is in competition by water and rail. The volume of forest products handled by our railroad has been increasing as the result of cleaning up the land. The white pine was first taken off; now they clean the land of every commodity, inferior timber and forest products necessarily making lower rate. Owners of timber along our line control railroad or water facilities; the Mather interests have railroads through Marquette County, and east to Evelyn, on our line, in which they are active competitors; the L. S. & I. is competitive, Ishpeming to Marquette, and the M. M. & S. E. east as far as Evelyn. There are the Mather lines.

The competition to which I have referred controls and fixes our freight rates on the systems and in Michigan; the competition of the north and south lines tapping our line at the different points establish a condition of rates on forest products that controls the rates from both local and competitive points on our railroad, particularly on lumber, as lumber rates are made on zone basis, and whether a mill is

located on our line or that of a competitor depends upon whether we give the same rate as the competitor.

The water rates affect lumber transportation to Chicago; we have established a rate of 2 cents per hundred pounds on lumber to Chicago less than we have from interior points, to meet this water competition, which will always be there. At the rates at which we carry, we have to make some profit, or we would stay out of the business.

1455 There has been some slight growth in agricultural products over our line. We have a 1% ruling grade, Duluth to Soo, which costs us 25% to 30%, in my judgment, more to operate than if we could reduce it to .5%.

The passenger traffic fixes the standard of maintenance and upkeep. I think our service compares very favorably with any of the railroads of which I have knowledge. Considering the extent of the traffic, I regard the passenger service as efficient and well maintained.

WALKER.

Cross-examination.

By Mr. Wykes:

The water front at east Houghton yard was used six or eight years ago. A trestle was built, which is, in part, still there; we are now considering having someone else use it. Since that time, there has been no use of the water front, in the shape of the use at that time, except that we expect to put some tracks over there; if the water is to be used, improvements must be made to fit the business; boats cannot land at our property without a trestle.

We consider dining car service necessary at all points where the journey covers the period of a meal hour; a good many (several) of our trains do not carry diners. I think the larger portion of them have diners; they are on 7 and 8, and on 1 and 2, which are big trains—our best trains. We have diners on both Chicago trains; we have diners, except west of Nestoria, on every train running any distance on our railroad. On the 14 trains between Ishpeming and Marquette only 1 and 2 have diners; these are through trains. West of Nestoria, we have two trains a day, each way, with a diner on one of them, Duluth to Bibon and return; there is no dining service in Michigan west of Nestoria. I should say trains carrying diners have a greater mileage than trains without; we haul a diner to Mar-

1456 quette, and are through serving at Newberry; we take diner to Marquette to go back next morning. Between Negaunee and Houghton we have four trains each way per day, and two trains each way taking dining cars.

Between Marquette and Soo we have two trains each way each day, both with diners, part of the distance; 1 and 2 have them Marquette to St. Ignace, and 7 and 8 Marquette to Soo. The mileage of trains on which diners are hauled is greater than that of those which haul no diners. I don't mean the diner mileage; we don't haul the diners the same distance that we haul the trains. The two

trains to Copper Country having diners are the St. Paul and Northwestern trains, and our 1 and 2.

At nearly all the 16 points where our road is intersected by other railroads, we transfer and receive freight, the volume of which is large; we are permitted, in that way, to reach points that we could not reach if it were not for those points of interchange, both in originating and delivering business. I have never made a computation to determine the proportion of business that we wouldn't reach or receive if we didn't have those interchange points. It is impossible to arrive at such computation, because of the fluctuation in traffic, commodities and conditions.

The South Shore line, Soo to Duluth, is 60 miles shorter than Soo Line mileage. Their running time of trains is pretty close to the same as ours; their ruling grade is .45%.

Escanaba and Gladstone to Ishpeming and Negaunee is 60 miles, as against 15 from Marquette to Ishpeming and Negaunee. Coal coming up that way has a considerably longer rail and shorter lake haul than coal coming via Marquette. Lake rates on coal to Escanaba are cheaper than to Marquette. Our coal rate is not made in
1457 combination with the water rate. I cannot give you the comparative rate, Gladstone and Escanaba with Ishpeming and Negaunee, and from Marquette to latter two.

I don't know proportion of South Shore's business between points local to its line. It would be quite a long computation to find it. I should say it was inconsiderable between strictly local points, except on logs to mills. I couldn't express it in a percentage, with any definiteness. By strictly local points, I mean that originating and delivered on the line. In saying that it was inconsiderable, I did not take into consideration that which arises on other roads in Upper Peninsula and is delivered to local points on this line. There is not a very considerable amount of business originating on South Shore and going to other railroads for Upper Peninsula delivery. I could not fix the proportion of that business.

Where you have the facility, train equipment, etc., you can add business without expecting the same return from it as if it were the first business of the road; that is the policy of all railroads. We try to make rates so as to make some profit on each commodity that we take.

WALKER.

Redirect examination.

By Mr. Cotton:

Trains 3 and 4, with C. & N. W. equipment, except mail and baggage cars, serve from Houghton to Ishpeming; they serve as South Shore trains from Ishpeming to Marquette; Northwestern diner on that train serves the Marquette and all intermediate business. The same is true of C. M. & St. P. Chicago trains 103 and 104, between Houghton and Champion.

(Stipulation that the latest maps of the Michigan and Wisconsin Railroad Commission may be referred to by either party with like effect as if in the record.) I don't think our line sells tickets
1458 in connection with the steamship lines between Duluth and Houghton, and Duluth and Marquette. (This witness was later called to testify before the Court.)

1459 On July 21, 1914.

RAY BROTHERTON, a witness called by plaintiff.

Direct examination.

By Mr. Tracy:

I live at Negaunee, and am Engineer in charge of Cleveland Cliffs Land Department. I prepared the following statement showing lots in Negaunee and Ishpeming, area in square feet, assessed value, and assessed value per acre, taking the areas from survey maps, and taking the assessed values from assessment roll; the figures are correct.

1460

Description.	Area in square feet.	Assessed value.	Assessed value per acre.
City of Negaunee.			
Iron Plat (or Pendill Plat):			
Lot 103	5,250	$600.00	$4,966.00
Lot 104	4,500	500.00	4,835.00
Lot 105	625	300.00	20,908.00
Lot 108	625	300.00	20,908.00
Lot 119	1,225	300.00	10,454.00
Lots 61, 62, 63 and 64	10,125	4,000.00	17,205.00
Maitland Addition:			
Lot 9, Block 2	5,400	500.00	3,920.00
Lot 10, Block 2	2,400	500.00	8,712.00
Lot 11, Block 2	3,250	300.00	3,920.00
Lot 12, Block 2	4,000	350.00	3,484.00
Lot 13, Block 2	4,650	400.00	3,736.00
Lot 14, Block 2	5,300	450.00	3,659.00
Lot 15, Block 2	5,950	600.00	4,356.00

City of Ishpeming.

Original Plat:

		Sale price, less building.	Sale price per acre.
Lot 86.....	3,500	7,000.00	87,120.00
Lots 133 to 136 inclusive...	16,100	12,000.00	32,234.40

1461 I figured the assessed value per acre, and the computations are correct. Lot 6 of Nelson's original plat is the property recently sold to Gately brothers, and lots 133 to 136 inclusive are the post office property. I got the sale prices on those descriptions from Mr. Tracy.

BROTHERTON.

Cross-examination.

By Mr. Wykes:

Lot 103 is a full lot; lots 104, 105, 108 and 119 are fractional, and belong to the Cleveland Cliffs. On lot 105, the railroad takes all of the lot except 625 feet. I have applied the assessed value of $300 to that 625 feet, and the same for other fractional lots.

We have known for several years that they were assessed as full lots, but have made no protest. There are right of way posts at the edge of the highway showing right of way line. Lots 61 to 63 are full, and 64 is a fractional lot. They are all vacant.

Lots in Maitland's Add. are 2,800 feet east of the depot and north of the old abandoned track. The Gately description, lot 86, had a structure on it at the time of sale, I think. It is the northeast corner of Main and Pearl. In getting the area, I figured the lot exclusive of streets. There is a street of 50 feet on one side and 60 on the other; the part exclusive of the streets is .08 of an acre; it is one of the good corners of the town. I deducted $500 for the building, under Cooley's testimony.

Lots 133 to 136 of original plat lie between Bank St. and C. & N. W. right of way, and I don't know whether there were business places on them or not. In all my computations, I included simply the land inside the lot line. On lot 136, to include the street would add 6,700 square feet, approximately, and makes the price
1462 per acre $22,651.20; including the streets in the Gately description, lot 86, makes the assessed value $40,510.80 per acre, reduced from $87,120. The assessed value of lot 86 is $6,500.

1463 On July 21, 1914.

JACOB P. WERNER, a witness called by plaintiff.

Direct examination.

By Mr. Eldredge:

I live at Marquette; am in business there. I am one of the five City Commissioners. I own real estate on Front St. I have bought and sold real estate in Marquette, and think I know its value in the business part of the city. For the land, without buildings, on southwest corner Front and Washington, 55 feet on Front by 127 on Washington, I would consider $350 a foot front on Front a fair price.

WERNER.

Cross-examination.

By Mr. Wykes:

I purchased property below this, across the street, about 12 years ago. I don't know of any sales anywhere near this price of $350 a front foot on Front. I base the valuation on what I paid for my property and what I consider it worth, and upon the rent return I could get. I paid $7,500 for 32 feet, 127 feet deep, with a foundation and cellar excavation.

I don't know what the corner in question could rent for; you could hardly figure the value of a lot on present buildings. It is the best corner in town, and the buildings are not good enough for the lot. It is better than any of the other three corners. It is the best piece of property in town.

1464 On August 11, 1914.

F. J. BACHELDER, a witness called by defendants.

Direct examination.

By Mr. Wykes:

I live at Madison, Wis., and am Engineer of Track Inspection of Wisconsin Railroad Commission, having been connected with the Commission about six months; my last previous employment was as Division Engineer of the Baltimore & Ohio, being such from 1905 to 1914. I have been employed by other railroads.

I took civil engineering course in University of Wisconsin, and am a member of the American Railway Engineering and Maintenance of Way Association, having been a member of the committees on tracks, on bridges, and on records and accounts.

From August 1st to 6th, 1914, I made a trip of inspection over South Shore. We covered practically the whole main line, except a short distance on the west end. Altogether, we rode over 800 miles on passenger trains, rode a distance on two freight trains, and walked about 25 miles of the track. Messrs. Atwood and Bristol were with me, except part of the time, and they made all the trips with me on foot.

We observed the effect of traffic on ties, rails and the roadbed, in general—of the entire track structure, including bridges. On curves, we observed the elevations, rail wear, and the effects of the various traffics; we observed the train speeds, taking them between mile posts, and getting the time between terminals. I observed the amount of wear on track on curves and tangents, and made comparisons. On B. & O., I did work in testing various materials with a view to determining the most efficient material to use and the effect of traffic on the material, and among them were studies of rail wear,
taking the rail wear on different degrees of curves and test-
1465 ing different kinds of steel rail. The tests were chosen on the
tracks where the heavy tonnage passed; it was not a study of the traffic, but of the rail wear, and we selected the tracks over which the heavy tonnage passed.

I covered the South Shore line with sufficient detail to express an opinion upon whether the road is maintained in a degree of excellence in excess of what would be required if the traffic were limited to freight, and I have an opinion upon that subject. I do not think the maintenance of the South Shore is of too high a standard for the freight traffic they have. If the track is allowed to get out of surface, it becomes harder for a train to pull an equal tonnage over the poor track than over a track in good surface.

There is undoubtedly an added wear on equipment from poor track maintenance. It takes more coal to haul loads over poorly maintained track and over rough track—more to pull the same load; it requires greater amount of power, or causes reduced tonnage. The only thing on the South Shore which, in my judgment, would be done for the operation of passenger trains would be the expense in painting buildings for appearance before it would be necessary to paint for the protection of the lumber. In track, the one added expense, for passenger service only, would be around station grounds, where lawns would be trimmed neater, and along the track they might cut a grass line. I did not see a grass line in many places; they were working at it. A portion of the trimming of weeds from the ballast, for neatness, would be for passenger traffic.

I recently examined exclusive freight tracks of the C. & N. W., on the St. Francis cut-off, between Milwaukee and Chicago; that freight line is of a higher standard of maintenance than the South Shore. I am familiar with the exclusive freight lines of the B. & O., and
while the wear on those is heavier than on South Shore, the
1466 standard of maintenance was about the same; that was the
Medina cutoff, of about 8 miles—a low grade line, used for freight trains exclusively.

In my inspection and investigation of South Shore, I had in mind the question of which traffic produces the greater wear on the track structure, and, in my judgment, the greater cost for maintenance due to mechanical wear is the freight traffic; it is considerably greater. You can compare the damage due to tonnage and to speed, by taking a district of heavy freight tonnage and comparing with it a district where it is largely passenger traffic; you would compare the damage to ties and to rail, especially on curves, and notice whether the flanges had cut into the head of the rail more on the freight or the passenger. On tangents, on very heavy traffic lines, the rail wear is perceptible. You would take the amount of wear for a month, or some stated time; that is about the only basis I know, except, with a freight traffic line, you could observe that the wear was very much greater on that line than on the passenger line.

On the C. & N. W. line, from observation of the freight line and the passenger line, it seemed to me that the freight traffic had the most wear. You know original section of the rail, and can get the amount of wear after the rail has been in track for, say, six months, and you can determine the wear per month, or for any stated period. I took rail sections on the C. & N. W.

On South Shore, we took a section of rail showing wear, in the district between L'Anse and Baraga, which is the district of their densest passenger traffic, and that showed very slight wear; we took a section between Eagle Mills and Marquette, where they handle very heavy ore tonnage, and there the wear was very heavy; the wear was on a

1467 percentage of 70 for the freight line and 30 for the passenger. The freight traffic was very much heavier between Eagle Mills and Marquette than the passenger traffic, and the passenger traffic there is somewhat heavier than between L'Anse and Baraga.

In going over the line, we took care to observe the curves, the degree of elevation and of curvature; we took measurements of elevations on about 13 curves. I also, on other curves, observed the riding quality of the track from passing over on the trains. You could thus observe the approximate elevation in the effect on the track. We took measurements where we walked over track, between Negaunee and Ishpeming, between Eagle Mills and Marquette, between Baraga and L'Anse, and at various points where we stopped a sufficient time when on freight trains.

In the 25 miles we walked over the track, we inspected the curves, to ascertain the amount of flow and wear due to the super-elevation of the upper rail. There was very little flowing of the metal. Where it does exist, it is usually on the lower side of the curves, indicating super-elevation; there is a small amount of that. I have platted, on diagrams, the amount of flow found.

I inspected the ties, to ascertain whether they were taken out on account of wear or weather causes; in the district of dense passenger traffic, Nestoria to Houghton, it appeared to me the larger percentage were taken out because of decay, and in the district of heavy

freight traffic, while there were certain taken out on account of decay, a much larger proportion were taken out on account of the ties being cut or worn by the rails. I took pictures to indicate typical instances of rail cutting of ties. (Photographs produced and marked Defts.' Ex. 31, Batchelder.) I took photographs to indicate typical conditions of ties taken out due to decay. (Photographs marked Defts.' Ex. 82, Batchelder.) On the parts of the road I examined, the cause of tie renewals would be the decay and the cutting of rail, about half and half. It looked to me, from the amount of work they had done, that the maintenance was increasing—the degree
1468 of maintenance.

On B. & O., comparing the tonnage line, over which the heavy freight traffic moved, with the line over which passenger traffic was done, the evidences of greater wear were on the freight line; that line was not engaged in exclusive freight. We took rail sections in our study of the problem on the B. & O., to indicate effect of tonnage movement.

For the purpose of study of rail wear of B. & O., we took the track on which the heavy traffic moved; the line was double track; the heavy traffic moved on the eastbound track, and the empties were returned on the west bound track, and the rail sections were taken on the eastbound track. We took that track for study and for sections, as it indicated the heavy wear, and the other track didn't make as good a location for our test, because it didn't have the heavy wear. Passenger traffic moved over both tracks, there being the same quantity of passenger traffic on each—corresponding trains in opposite directions. The loads of coal moved on the eastbound track, on which there was a much heavier freight tonnage.

The result of studies of rail wear on this heavy tonnage track is indicated by certain charts I have produced, six in number. The purpose of the investigation was to determine whether a rail with a wider head on the flange side would add to rail life. The measurements taken indicated a heavy rail wear on the high tonnage line, and a short life of rail on that line, and that, after the rail had been in track a short time, the head wore back to a point above the web on the *guage* side. I found there that the time in which the tonnage wore the A. S. C. E. sections back to a point above the web varied with the degree of curve; for a three degree and 30 minute curve, the rail life was 32 months, and in this rail the wear was almost back to the side of the web, next to the *guage* side.

1469 On a compound curve, four degrees and 36 minutes, and six degree curve, on the eastbound track, a Manning rail was worn so that the throat of the flange came back to the side of the web, next to the *guage*, in 31 months; on the upper rail, it was worn back to a point above the inside of the web. At that point, the rail was elevated for safe passenger and freight train speeds,—a medium speed,—especially on the ruling grades.

On a compound curve, five degrees and 30 minutes, and an eight degree curve, the life of Manning rail was 31 months. On a Man-

ning rail, the flange side of the head is increased in width about 3/8 of an inch, giving additional wear area on the gauge side; on that rail, the wear was to over the inside of the web. On another Manning section, in a six degree and 30 minute curve, the rail life was 31 months, and the wear was a little further back. Those are all outside rails. None of those show low rail wear, as the Manning section was only put on the high side. There was very heavy rail wear on the low rail, especially on the grades; it was more flow; it wasn't necessary to take it out of track as quick as you would the high, on account of the flow, because you had more lateral strength in your rail. The cause of this wear was the freight traffic.

We found no curve on South Shore that had anything worn quite as excessively as on the B. & O. I found on their low grade line, between Ishpeming and Negaunee, some wear on the high side of a curve that approximated this wear. Generally speaking, I did not find the rail on curves on South Shore worn to the extent to which they are on the curves I have just described. The rail between Ishpeming and Negaunee that had large wear bore an old date, and I couldn't get reliable information on how long it had been there.

I examined some of the ore cars and loads, and their constructions; their wheel base is shorter than the ordinary hopper car I have been familiar with, concentrating the load more on a
1470 bridge or a short stretch of track. It would probably produce a larger stress on track, on account of the concentrated load, when under speed, than the same weight of car with a longer wheel base, and on a bridge it would produce a greater stress than as if the load were more distributed, depending on the span. From the wheel base and study of some of the spans, I found these ore cars would produce a greater stress on some of the bridges than some of the locomotives would. It is a fifty ton car; the cars themselves weigh 33,000 to 35,000 pounds. I think they have a locomotive weighing 190,000 pounds, but that has a longer base. I had the company's locomotive diagrams.

The higher center of gravity of a load, if it is on a curve, will tend to crowd the high rail, and on straight track an engine with a high center of gravity and any inequalities in track will tend to cause it to roll or rock, and the higher center of gravity will tend to push the gauge of your track out of line; the hazard of derailments is also greater. I noticed two derailments when we were there, or their effects; there were a good many broken ties, in a pile, outside the track. I was told by a conductor it was a freight train derailment. Derailment is a source of considerable expense for track structure at times.

The freight train derailment damages track very much more than a passenger train derailment. The effect is usually a great many more broken ties from your heavy freight cars derailed than from your passenger train. For the passenger train, usually, part of the engine equipment is derailed—the tender usually—and it scars the ties, but does not break them as much as a freight derailment. In

my experience, freight derailments are more frequent than passenger derailments.

I platted, on the charts, the rail wear on three South Shore curves. (Blueprint marked Defts.' Ex. 83, Batchelder.)

1471 I did not mean the tie renewals would be half decay and half wear for the road, but for the district where those pictures (Defts.' Ex. 81 and 82) were taken. I made computations, or notes, fixing the amount of rail wear for freight trains at 62% on the whole line, and 32% passenger, taking this from counting ties in track in a district 3,000 feet long. I attribute the rail cutting to freight; your decay would be divided between freight and passenger on the percentage of the traffic of the two, but your wear is attributable to the freight trains, which cause a large percentage of the cutting of ties.

On this road, the cutting by freight trains would probably amount to 90%; that would be from observation of your heavy loads, and the relative effect of your heavy loads and your light passenger cars. I don't think the locomotive cuts the ties as much as the car, on account of your equalizers on your engine; the shock is taken up by the equalizers, and you wouldn't get as much of a shock from track being out of surface from your engine, because it is better distributed over your equalizers. Your freight car has springs, but they are not nearly as effective as the equalizer springs in your engine, or in your passenger cars. In estimating 90% of the cutting due to freight, the volume of freight carried and the weight of your car would necessarily enter into it. In the line, Nestoria to Houghton, it is perceptible that the rail did not cut the ties nearly as much as where they carried the heavy freight traffic, between Nestoria and Marquette. Defts.' Ex. 83, Batchelder, charts measurements of a four degree curve east of Baraga, laid July, 1912, a five degree curve west of Bagdad, laid August, 1912, and a five degree curve one mile west of Negaunee, laid August, 1911. I chose those curves with reference to the degree of the curve, but not especially on account of the wear; I aimed to take them on a particular curve, to be a representative section; that is, not any defective rail, or anything of that character.

1472 The fact that I could secure date of laying had to do with the particular section; it was all new 80 pound rail, laid within the last two or three years.

Those sections and measurements don't indicate anything what you would call excess wear due to super-elevation. The effect of super-elevation is largely indicated on the low rail; if your elevation is too great for your speed, especially for your freight trains, in a very heavy traffic district, the metal flows on the low side of the rail, and the rail tends to cant out when you have too much elevation. Too much elevation tends to increase the wear on low rail; I never noticed any material difference in the high rail, but the tendency is to increase the weight on the low rail by super-elevating. On the rails shown on Defts.' Ex. 83, the greater amount of wear in each instance is on the upper rail.

Expressed in square inches of wear, the reduction is: On four degree curve east of Baraga, upper rail, .02 of square inch, and low rail, — of square inch; on five degree curve west of Bagdad, high rail, .09 of square inch, and low rail, .05 of square inch; on five degree curve west of Negaunee, high rail, .14 of square inch, and low rail, .13 of square inch. The total wearing area of the head of an 85 pound rail would be 3.49 square inches.

On the Cumberland Division of the B. & O., on the eastbound track, the high rail on a seven degree curve was worn 1.2 square inches in area, in 31 months; on a compound curve, five degrees and 30 minutes and six degrees, the reduction of the high rail was .255, and of the low .18, of an inch, in 4.5 months.

On a compound, eight degree and seven degree and 30 minute curve, the reduction on the high rail was .22, and on the low, .257, of a square inch, in 4.5 months. On a compound curve, five degrees and 30 minutes and eight degrees, the reduction on the high side was 1.14 inches in 31 months. On a seven degree and 30 minute curve on Cumberland Division, the reduction on high side of
1473 curve was 1.2 square inches in 31 months. On a two degree and 15 minute curve, the reduction on high rail was 1.495 square inches in 43.5 months. On a four degree curve, the reduction of the high rail was 1.595 square inches in 43.5 months. On a ten degree curve, the reduction on high rail was 1.71 square inches in 27 months.

In study of rail wear of B. & O., I spent a month in the field, taking sections of rail with a machine. I studied amount of elevation on South Shore, and came to the conclusion that they were elevated for a speed of 35 to 40 miles an hour—a safe speed.

BATCHELDER.

Cross-examination.

By Mr. Eldredge:

I have never been directly concerned with operation. As division engineer, my duties included maintenance of the track and track structure.

The following quotation from pages 13 and 14 of an article of C. P. Howard in Bulletin 115 of American Railway Engineering and Maintenance of Way Association, published September, 1909, represents my judgment:

"Objections to curvature increase with the speed of trains. We assume this to be a fact; which is to say, it is justifiable to spend more money per daily train to take out one degree of central angle on a fast line between New York and Chicago, than on a slow-speed coal branch in the mountains. It is difficult to prove this by mathematics. The centrifugal force increases as the square of the speed. The super-elevation of rail designed to resist this force is a palliative

rather than a cure, and when elevated for high-speed trains, is charged with being a prolific cause of derailment for slow trains. Moreover, on track elevated for forty-five miles an hour, trains may run at fifty or sixty, and when elevated for sixty miles, a speed of seventy or eighty miles may sometimes be attained. For freight trains the conditions are different. Wellington says (page 268): 'It is fully as difficult and dangerous to run freight trains over sharp curves at twenty-five or thirty miles per hour as passenger trains at sixty miles per hour, owing to the difference in their mechanical condition.' We may, therefore, take about one-half the passenger train maximum as a corresponding maximum for freight
1474 trains, and it may be sufficiently accurate in many cases to figure only on the speed of passenger trains on the assumption that the speed of freights will be proportionately lower so as to give about the same economy and safety in operating over any given curve."

I have the data respecting relative rail wear on freight and passenger line on C. & N. W., between Chicago and Milwaukee. I took measurements on curves on the passenger line and on the freight line.

A heavy freight train, if stopped on track, tends to pull the rail and cause it to creep in the direction of the movement of the train, the amount of creeping depending on the weight of your train and tonnage, and the creeping during a particular period depending upon the amount of tonnage carried over the track; the number of stops would enter into it.

This creeping effect is not very noticeable under passenger traffic. On double track, where the loads are moved largely in one direction, the creeping of the rails is very much greater than in the opposite direction, where only the passenger trains and empties are moved; the most serious effect is to throw the track out of line; it causes the ties to slew together, and damages them, and pulls the spikes, and the rail and angle bars cut the ties; it permanently damages the rail, and the creeping of track tends to close up the expansion, and tucks or bends the rail at the joints, and gives it a permanent set.

It requires the track force to align the track, to drive back the rail, and open up the expansion, especially in hot weather, and the renewing of the rail becomes necessary; when your rail gets bent at the joints, the heavy traffic going over it tends to pound or batter the ends of the rail, and makes it necessary to renew it much sooner than otherwise, causing tie replacement and labor.

1475 In testifying, yesterday, to greater track damage from freight, I considered the character of freight equipment, and the shifting of loads. The freight equipment is not of as high character or design as your passenger equipment, and it is not maintained to as high a standard; rather, you could call it a crude construction, compared with the passenger train equipment, in that it only has four wheel trucks, while most of the passenger equipment has six wheel trucks, and the springs are more elaborate in your

passenger equipment, and your side bearings are kept oiled; usually, they have some patented side bearing on the coach roller bearing. It is not customary to oil the side bearings of freight cars, so, when they are in a certain position, supposing they are not traveling in the direct line of your tangent, the tendency is for them to hold that position until they are guided, and not oiling them, and not being as true, they don't guide as easy.

The loading of freight equipment, of course, would shift, and it very often causes a car to be down on one side bearing, which will tend to hold the truck in a position not in the line of the direction it is taking—the direction of the rail—and, if it is not down on the side bearing, that is shifted enough so it holds the car down on its side bearing, on the bolster, it will tend to rock the car, keep the car rocking, and, of course, any impact that the track would get from the rocking of the car would cause more damage to the track.

I also had in mind imperfections in wheels and difference in wheel construction, and things of that character. A flat wheel on a freight car is not removed anywhere near the same time as on passenger equipment. You have a flat wheel on passenger equipment, and it is removed at once, and discipline is very severe for anyone who flattens a wheel on passenger equipment. The items I have spoken of as causing greater freight wear would be appreciable, as a whole; they represent considerable items.

1476 I went on to the L. S. & I. railroad and made investigation to determine whether that was of a higher or lower degree of maintenance than South Shore. I found their standard of track construction was better than that of the South Shore.

I took photographs to illustrate this. In addition to maintaining as good surface as the South Shore, they have tie plates on curves, saving the tie from being damaged by rail cutting, and assisting in maintaining the gu*a*ge. That gives two or three spikes to help keep the rail in place or in gauge; on some of their curves they had tie rods. The South Shore, without tie plates, would have only one spike outside the curve rail, to take the thrust, while, with the tie plate, the outside and inside spike both help maintain the gu*a*ge and take the outward thrust. (This has a bearing, because the L. S. & I. is an exclusive freight road, with the exception of a very limited passenger service, and is better maintained than South Shore.) The joints on L. S. & I. are re-inforced, and more expensively constructed. They vary from the ordinary angle bar, in that it is a truss effect; the joint has wider flange, and this flange is so rolled that it forms a truss under the joint, and gives better rail support.

1477 On August 12, 1914.

LEVI P. ATWOOD, a witness called by the defendants.

Direct examination.

By Mr. Wykes:

I live at Madison, Wis. I am on the engineering staff of the Railroad Commission of Wisconsin, and have been since March 1, 1914. I have been more or less actively connected with railroad work since the beginning of 1896.

I was in the Maintenance of Way department, in the beginning of the year 1896, on the Peoria & Pekin Union Railroad. In the summer of 1886, I went to the Rio Grande Sierra Madre & Pacific in Mexico, as Assistant Engineer, and in 1987 I was made Engineer of Maintenance of Way of the same road, and I was with them practically all the time, in that capacity, until 1903. I was then made Superintendent of the road, and, in that capacity, had charge of maintenance of way department; while in that capacity, I also served as Chief Engineer of the Sierra Madre extension, in Mexico; that was intended to be a portion of the road of which I was superintendent, but was a separate organization. In March, 1905, I became Engineer of Maintenance of Way of the Chicago, Peoria & St. Louis Railway; I was with them for a few months, and was transferred to the Litchfield & Madison Railway, as Superintendent. I stayed with that road until the spring or summer of 1906, and I became Assistant Engineer on the Southern Pacific lines of Mexico, in charge of operation of lines that were constructed but had not yet been turned over to the operating department. I there fulfilled the duties of Superintendent and General Storekeeper, and had charge of the transportation, maintenance of way and equipment, work pertaining to the lines under operation but still in the hands of the chief engineer.

I left the service of the Southern Pacific in 1906, and engaged in private practice, in California, with headquarters at El Paso, Texas. During that time, I performed various classes of engineering work,
1478 covering some railroad location and construction and a great deal of railroad reconnais-ance work in connection with general engineering matters. Those were just railroad matters that came to me in connection with my private practice; but, during that time, I did considerable reconnais-ance and railroad construction.

None of the roads on which I did reconnais-ance or location work had been built, with the exception of one road that I started construction of and which was stopped because of the Mexican revolution, after I had it partially completed.

I am a graduate of the High School of Rockford, Illinois, and of the University of Illinois, in civil engineering; also a business course, at Rockford.

I accompanied Mr. Batchelder on trip over the South Shore, the itinerary of which was correctly stated by him. My purpose was to observe the character of the roadbed, with reference to condition, maintenance, and the traffic. I investigated it with reference to the character and degree of its maintenance, endeavoring to keep in mind the roadbed, ties and rails, to the greatest extent possible.

We spent five days, from August 1st to 6th, and I walked over 25 miles of the track, and observed the elevation on a considerable number of curves, and I observed that, in most cases, the wear predominated on the outer rail, where there was very much wear in evidence. I noted the curve elevations were not always uniform, nor consistent.

I rode on two freight trains, and took the speeds. The maximum freight train speed I found was 34 miles. It was our intention to catch maximum speeds, and we took none under 25 miles an hour of freight trains. We took 18 different instances, as I recall, and none of them happened to fall below 25 miles an hour; on
1479 two different freight trains, the maximum was 34 miles. We took the time a considerable number of timees between various mile posts on different passenger trains, to ascertain the speeds, and found the actual running time between mile posts to be 53 miles, maximum, and a majority of the miles we took fell between 40 and 45 miles. We took 68 different speeds, and the majority fell between 40 and 45 miles, when we thought they were running probably at their maximum speed, or at places where you might expect maximum speed, the purpose being to catch actual maximums.

In my engineering work, I have had charge of maintenance. On the Litchfield & Madison Railroad, of which I was Superintendent, 40 odd miles out of 50 was engaged in exclusive freight service.

My investigation of South Shore was sufficient to permit me to form an opinion as to whether the road was maintained in a higher degree of efficiency than it should be if the road were engaged in freight service alone, and I did form an opinion on that question. In my judgment, the South Shore is not maintained to a higher degree of perfection or efficiency than it should be if its business were limited to freight.

My investigation was directed to that particular question. I think it is maintained in a condition that is entirely safe for passenger business. I saw some things that, if I was in charge, I would like to improve; but, from the character of maintenance and the information I had, I considered the road in very good shape, as far as maintenance is concerned. In my judgment and experience, I would want the roadbed kept in just as good or better condition, as to its strength, for freight traffic than for passenger traffic, so far as roadbed and track is concerned. That includes the track and road structure, and I am referring to strength, not to appearance.

1480 A poor degree of maintenance adds very materially to the cost of operation; as the degree of maintenance drops off, the cost of operation, with reference to those items that are affected by the perfection or imperfection of the track, increases in a greater ratio.

If the maintenance work is neglected, and the joints become low, bolts loose in the angle bars, and track and roadbed not properly drained, the ties commence to churn, and, if they are not taken care of very quickly, they get in a much worse shape very rapidly, and it takes more force and costs more to get them back in shape than it would if it was kept up. The old adage "a stitch in time saves nine" is applicable to track maintenance. It works not only with reference to the track expense, but also -as a deleterious effect upon the repair and maintenance of equipment.

It also has an effect upon the capacity of loads, if it gets to a bad enough degree. It has an effect upon the cost of coal, and will affect all items with reference to getting the trains over the line These costs would increase as the degree of maintenance went down.

The South Shore tie renewals are due to decay and mechanical wear. The cause varies in different parts of the road. The majority of ties I examined, Nestoria to Houghton, were taken out because of natural decay, and at different places along the main line, particularly between Marquette and Nestoria, the majority of ties came out because of mechanical wear, rather than decay. I noticed more cut ties in track, Marquette to Nestoria, and east of Marquette, and west of Nestoria, than between Nestoria and Houghton. When I say cut ties, I mean cut to an inch or more. I noticed most cutting between Marquette and Nestoria.

In the curves I observed, I noticed very little wear on the inner rail; the wear was mostly confined to the outer rail. I looked for the wear on both rails.

1481 The intention on this road seems to be to carry an elevation that is correct for speed between 35 and 40 miles an hour, though the elevation is not consistent, and varies at different curves of the same degree, and in the elevation of the same curve. I arrived at their intention from the examination of the elevation and answers of different track men as to elevations they were intending or instructed to carry. I examined curves wherever I had an opportunity, examining all the curves where I walked over the track. I took the elevation on, and made a record for, 13 curves.

I have four different curves of 4 degree, with elevations of one inch, 1⅜ inches, 1½ inches, 1¼ inches, 1¾ inches, and 1⅛ inches, all on four degree curves. On a 2½ degree curve is an elevation of 1⅝ and 2½ inches, at different points. On a 3 degree curve, at three different points, were elevations of 2⅝ and 2⅞ inches. Thus, elevations of the same curve would be taken at different points on the curve.

That would not account for the difference. The super-elevation, measured with these different results, shows that they are not consistently maintained in elevation, nor is the same degree of elevation carried on all curves of the same degree. Most of these curves were measured at random, as we came to them in the course of our walk; wherever rail section was taken for rail wear, we took the elevation at that point, also, but others were simply at random on the curve we were walking over. We didn't pick out a curve and go to it with the

specific object of measuring its elevation, and didn't measure some and then exclude the measurements. I was also careful to take the measurement so it wouldn't be affected by the "run-off."

My judgment is that, on South Shore, the freight train mile would cost more, with reference to those items pertaining to roadbed, rail, ties, ballast, sub-grade and bridges, than the passenger train mile.

1482 I assisted Mr. Batchelder in taking the measurements of rail sections shown on Defts.' Ex. 83, Batchelder, and that exhibit correctly shows the conditions as we found them.

There was no pre-meditation with reference to where we walked. For instance, at Soo Jct., Kenton and Trout Creek, we walked because the train service gave us the time; we dropped off the train at Baraga, to walk to L'Anse, and that is the only place that we anticipated where we were going to walk. When we were off the trains, between trains at different points, we utilized the time walking and observing the track, but that is not included in the list, because it wasn't distance enough to mention.

I noted all the track labor working as I passed over the line, making a memorandum of the track forces. I took the limits of the sections from the profiles, and tabulated the data, to form some conclusion as to the maintenance forces and their distribution. There is more labor in the portion of the track, Marquette to Winthrop Jct. (north line), than anywhere else on the line that I saw; the next in order is Marquette to Eagle Mills (south line); the next, Nestoria to Houghton; the next, Winthrop Jct. to Nestoria; the next, Soo Jct. to Marquette, the next, St. Ignace to Soo Jct.; and the least, Soo to Soo Jct. Marquette to Winthrop Jct., there was an average of .79 of a mile of main track per man I saw working, and Marquette to Eagle Mills, .86 of a mile per track man. That does not include the extra gangs I saw working, but only the regular maintenance forces.

I was firmly convinced in my own mind, after making a trip over the road, that renewals and betterments work had been rather heavy in recent years, and that was confirmed, in my opinion, by statistics that were made available for my observation after I returned, with reference to tie renewals over a considerable period of years

1483 past, and also with reference to the charges against the maintenance of way accounts for a very considerable number of years past, and they tended to confirm the opinion that I had formed by going over the road, that renewals and betterment work had been rather extensive in recent years. Of course, the rail showed for itself.

The Master: Then your judgment would be that, previous to recent years that you refer to, it was not kept up as it ought to be?

A. I couldn't say as to that.

The Master: That would follow, wouldn't it, from your testimony?

A. Just a deduction that one might make; I never saw the road in years past.

The Master: Wouldn't that follow from your testimony that you have given heretofore?

A. Not entirely. This might be the condition: The road ten years ago might have been in just as good a degree of maintenance as it is today, but, through tightening of money, or desire of the management, or for some purpose, the expenses for maintenance of way might have been curtailed, and, by the way, that is the first department that always gets it, whenever there is anything shut off, the maintenance of way department is generally the first one that has to reduce expenses, and had they started in then to curtail their maintenance of way expenses, without any intention of letting the road get away from them, nevertheless, it might have deteriorated more than they anticipated or had thought that it would, and three or four, or possibly five, years of that kind of maintenance would get it in such shape that it would be necessary to make unusual expenditures to get it back into the shape that it might have been, say, ten years ago, without any intention to let it get down below normal condition. From the road itself, except the rail, there was nothing to indicate when the improvements were made.

Refers to D. S. S. & A. Ry.

Actual Running Time Taken.

Train No. 1—St. Ignace to Soo Junction, August 1st.

Date.	M. P.	M. P.	Min.	Sec.	M. P. H.	Average running speed.	Grade.	Curves.	Station stops.		
8/1/14	A12	A13	1	14	48	....	— .8	No	25 sec.	Arr. 59 Min. late	
"	A15	A16	1	15	48	....	— .6	No	43 "		
"	A25	A26	1	23	43	....	+ .2				
							— .2	Yes	9 Min. 25 sec.		
"	A31	A32	1	20	45	....	— .5	No	12 sec.		
	Total Train No. 1.....								10 Min. 45 sec.	Av. Card speed = 22.4	
	Train No. 18 Soo Junction-Soo 29.1:									Leaving 1 hr. 5 min. late at 12:07 P.	
	40	39	1	35	36	....	+ light	No		Arr. 1:47 P.	
	33	32	1	30	40	....	+	Yes			
	28	27	1	30	40	....	light	No		Av. card speed 29.1 mi.	35 S
	21	20	1	30	40	....	— 0.5	No			13 S
	18	17	1	35	38	....	— 1.0	Yes			23 S
	15	13	3	17	37	....	— 0.7	No		Stopped at Brimley	21 S
											13 S
	7	2	6	48	44	....	light	No			2 Min. 00 S
											56 S
											4 Min. 41 S

Train No. 217—Soo-Soo Junction:								
43	44	1	25	42	....	No	No	
Train No. 1—Soo Junction to Marquette, August 2nd, 1914:								
49	50	1	31	40	....	— light	No	Counted frequently also by joints and caught speeds from 42 to 49 M. P. H.
51	52	1	19	45	....	— "	No	
53	54	1	18	46	....	+ "	No	
56	57	1	16	47	....	No	No	Av. card speed is 27 mi. per hr.
62	64	..	..	..	....	— light	No	Running 44 to 47 M. P. H.
73	75	..	..	..	....	"	No	" 41 to 45 "
97	98	..	..	..	....	No	No	" 43 "
98	99	1	19	45	....	— light	No	

1485

Refers to D. S. S. & A. Ry.

Actual Running Time Taken.

Train No. 1, of 8/2/14, Continued.

Date.	M. P.	M. P.	Min.	Sec.	M. P. H.	Average running speed.	Grade.	Curves.	Station stops.	
	118	119	1	30	40	....	+0.4	Yes	3 M. 15 S.	3 M. 30 S.
	119	120	1	30	40	....	+0.5		35 S.	15 S.
							−0.8	Yes	26 S.	39 S.
	122	123	1	10	51	....	−1.04	Yes	1 M. 03 S.	1 M. 37 S.
	137	138	1	25	42	....	−1.0	No	25 S.	3 M. 12 S.
	138	139	1	14	48	....	−1.0	Yes	11 S.	20 S.
									6 S.	19 S.
	143	144	1	16	47	....	No	Yes		31 S.
										2 M. 02 S.
										34 S. = 20 M. 27 S.

Average Speed Train No. 1, 35 Miles. Average card speed is 27 miles per hour.

8/3/14 Train No. 4—Marquette to Ishpeming:

	162.6	155.6	13	00	32	....	−2.5	Yes	Actual Running Time.

8/4/14

Train No. 3—Eagle Mills-Marquette:

165	166	1	32	32	....	+1.5	Yes	Run on time.	Sta. Stops 12 S.
								55 Min.	
									15 S. 2 M. 15 S.
								2 Min.	00 S. 7 M. 02 S.
									43 S. 1 M. 35 S.
								Total	69 Min. 02 S.

Train No. 5—Nestoria-Sidnaw: Left 9:25 A. M. Arr. 10:11 A. M.

203	204	1	41	32	....	+1.0			
						−0.7	Yes	Sta. Stops	1 Min. 07 S.
207	208	1	20	45	....	−0.4			
						−0.6	Yes	1 "	19 S.
212	213	1	22	43	....	+1.0	Yes		54 S.
									16 S.
222	223	1	39	36	....	+0.6			18 S.
						−1.0	Yes		05 S.
								Total.....	3 Min. 59 S.

Average running speed, 34. Average card speed = 25 mi. per hr.

Date.	M. P.	M. P.	Min.	Sec.	M. P. H.	Average running speed.	Grade.	Curves.	Station stops.			
	Train No. 55—Sidnaw to Bruces Crossing:											Left 10:37 A. M. Arr. 2:38 P. M. 26 Min.
8/4/14	226	227	2	6	28	....	—0.7					
							+1.0	Yes	2 Min.			
	228	229	2	3	29	....	—1.0	Yes	19 Min. 38 Sec.			
	229	230	2	5	28.8	....	—1.0	Yes	1 Hr. 42 Min. 12			
							+0.6					
	230	231	2	13	27.0	....	—0.6	No	9	00		
	231	232	2	2	29.5	....	—1.0	Yes	7	34		
	236	237	1	54	32.0	....	—0.8	No	2	24	23	Total.
	240	241	2	25	25	....	+0.5					
							—1.0	No				
	241	242	1	56	31.0	....	+0.9	Yes				
							+1.6					
	247	248	1	56	31.0	....	—0.9	Yes				
	Average running time.....					18						
	Train No. 6—Bruces Crossing to Nestoria:											Left 17 Min. late. Arr. 14 Min. late.
8/4/14	246	245	1	34	38	....		Yes	M. P. 250.1 to 200.9			
	242	241	1	31	39	....	—1.0	Yes	Sta. Stops, 0 Min. 15 S.		0 M. 10 S.	
							+0.9					
	238	237	1	24	43	....	—0.9	No		08	12	
	237	236	1	18	46	....	+0.8	No		26	13	
										10	27	
									1	01		
										53	1 33	
	Average running time					30.0				2 25	7 57	Total.
	Average card time is 27.5 mi. per hr.									09		

8/4/14 Train No. 4—Nestoria to Marquette:

M. P. 200.9 to 155

198	197	1	35	38	....	No	No	Left 8 M. late. Arr. on time.
197	195	2	35	23	....	Light	Yes	
189	188	1	27	41	....	—1.0	Yes	2 Min. 04 Sec.
185	184	1	31	40	....	—0.8	Yes	2 11
179	178	1	25	42	....	No	Yes	24
175	174	1	17	47	....	—0.8	Yes	07
						—1.0		
165	164	1	12	50	....	0.0	Yes	35
162	161	1	24	43	....	—0.4	Yes	Total 6 Min. 08 S.
161	160	1	50	33	....	+0.3	Yes	
160	159	2	05	29	....	—2.5	Yes	(M. P. 162 to 155 in 16½ Min.)
159	158	1	57	31	....	—2.5	Yes	
158	157	1	59	30	....	—2.5	Yes	Average card time is 23 miles per hr.
157	156	2	11	27	26.0	—2.5	Yes	

8/5/14 Trains No. 105 and 103—Marquette to Keweenaw Bay: M. P. 155 to D 22.5

	M. P.	M. P.	Min.	Sec.	M. P. H.	Grade.	Curves.	Station stops.	
	177	178	1	43	35	—0.4	Yes		Lv. 7:50 A. M. Arr. 10:57 A. M.
	197	198	1	40	36	No	No	2 M.	15 S.
	199	200	1	28	41	+0.6	Yes		58
	D 10	D 11	1	08	53	—3.0	Yes		08
									31
	D 13	D 14	1	33	39	—3.0	Yes	2	35
								1	45
	D 16	D 17	2	31	24	—3.0	Yes	2	00
	D 17	D 18	2	30	24	Light	Yes		12
	D 18	D 19	1	22	44	—1.5	Yes	1	04
	D 19	D 20	1	19	46	Light	Yes	*1	40
	D 20	D 21	1	21	44	Light	Yes	Total 13 M.	04 S.
	D 23	D 24	1	32	39	No	Yes		Average card speed is 23.5 mi. per hr.
	D 26	D 27	1	43	35	—1.5	Yes		
	D 27	D 28	1	21	44	—0.4			26.6 av. actual running time Nos. 105 and 103.

	Train	No.	33—L'Anse	to	Houghton.	Lv. 4:10	P. M.	L'Anse.	Arr. 4:22	Baraga:
8/5/14	D 19	D 20	1	47	34	Light	Yes			
	D 20	D 21	1	49	33	Light	Yes	Lv.	4.41	Baraga
	D 27	D 26	2	02	30	—0.4	Yes	Ar.	4.57	Keweenaw
	D 29	D 30	1	55	31	Yes	Yes	Lv.	5.44	"
	D 31	D 32	2	20	26	...	Yes	Ar.	6.15	Chassell
	D 32	D 33	2	18	27	...	No	Lv.	6.58	"
	D 33	D 34	2	03	29	Light	No	Ar.	7.15	at D 46
	D 34	D 35	2	08	29	Light	No			
	D 37	D 38	2	04	29	No	No	Light train tonnage		

Average running speed is 25 M. P. H.

8/6/14 Train No. 2—Houghton to St. Ignace:

D 39	D 38	1	28	41	No	No
D 35	D 34	1	29	40	Light	No
D 31	D 30	1	28	41	—0.5	No
D 20	D 19	1	17	47	Light	Yes
D 16	D 15	4	40	13	+3.0	No
D 14	D 13	7	00	8½	+3.0	Yes
D 6	D 5	1	15	48	—0.4	Yes
D 4	D 3	1	16	47	—Light	Yes
D 3	D 2	1	29	40	—Light	Yes

Average running speed 27 M. P. H.
D. card speed is 24.7 mi. per hr.

D 48.6 to A .0—292.4 Mi.
Run practically on time

Sta. Stops	1 Min.	38 Sec.	
		22	
	2	42	
	1	14	
		33	
	2	45	
	1	40	Ar. at Herman 12.50 P. M.
		07	
Total.....	11	01	

Above stops between Houghton and Nestoria only.
D refers to Houghton, Nestoria, Branch.

1488 *Summary.*

Pass.—Fr.

Total miles speed checked with stop watch	68
No. cases speed 50 miles or over	3
" " " 45 to 49 Mi.	17
" " " 40 44	24
" " " 35 39	12
" " " 30 34	6
" " " below 30 Mi.	5
Freight Train Speed total taken	18
" " " 30 or more	7
" " " 25 to 20	11
" " " below 25 mi. per hr.	none

1489 Train 55 is a freight. With reference to this train, I noted the actual running time between mile posts in nine instances. I noted all the stops between stations, and from the total time between stations I deducted the actual time the train was at a standstill, and divided that by the miles, thus arriving at the actual average running time, including the running time of getting under way and making the stops, but eliminating the time the train was standing still.

Train 33, a freight, treated in the same manner, showed actual average running speed of 25 miles an hour, and between mile posts D 19 and D 20, on a four degree curve, level track, a speed of 30 miles an hour was noted.

In this tabulation, the first column gives the date, the next two give the mile posts, the next two give the minutes and seconds of actual running time, the next gives the miles per hour, the next gives the average running speed, the next gives the grades, the next, whether on a curve, and the last column is remarks, including the intermediate stops, noted with a stop watch. The average card speed noted is the difference between the leaving and arriving time, as shown on the time card, divided by the distance between stations. The average running speed is the actual time the train consumed while under motion. All trains but 55 and 33 were passenger.

In taking the two freight trains, there was no design except to facilitate the time on the road, and to expedite covering the road in the shortest time possible.

It takes a little longer time to start a freight than a passenger train, depending on the tonnage and engine, the grades, and the place on the track at which the train starts and stops; but, generally, it takes more time to get a freight train under headway and slow it down than it does a passenger train. On South Shore, there
1490 is no great amount of extra time used in slowing down freight trains; but, generally speaking, it does take more time, as

the brakes are not as efficient on a freight train for quick stops, and the freight engines are not designed to accelerate their speeds as quickly as are the passenger engines.

1491 On August 12, 1914.

G. F. BRISTOL, a witness called for defendants.

Direct examination.

By Mr. Wykes:

I live in Grand Rapids, and am, and have for eight years been, engaged in contracting for concrete foundations, principally railroad bridge foundations. Previous to that, was in the employ of the Pere Marquette for 17 years, in the engineering department, in various capacities, on location, construction and maintenance of way, four years being spent as Assistant Engineer in charge of maintenance of buildings and bridges. My territory covered the Grand Rapids district, of about one thousand miles of main line.

I am at present assisting Professors Cooley and Riggs in making valuation of the Pere Marquette, having been on that work two weeks, and being employed by Mr. Riggs.

In my work for Pere Marquette, I became familiar with the character and degree of maintenance necessary for different services. I went over the South Shore with Messrs. Atwood and Batchelder. The description of the trip was substantially as stated by them.

It was my purpose to observe, and I did observe, the same things entering into the track structure as Mr. Batchelder testified to observing. I formed an opinion upon whether the South Shore bridges would be of any less expensive type or maintained in any less degree than at present if the service was limited to freight. My opinion is that the bridges are, for safe and efficient freight traffic, none too well maintained, and the types none too good.

Taking the track structure and roadbed of the South Shore, which I examined, as a whole, my investigation was sufficient to permit me to form an opinion of whether the degree of maintenance was beyond what would be required if the road had freight service only.

1492 I formed an opinion upon that question. It was that, for efficient and economical freight operation, I would not advise a lower degree of maintenance.

Our observation of ties removed from the track seemed to point very strongly to the predominance of wear as determining the removal of ties from track. We noticed ties in track for rail cutting, and the rail cutting was quite general over the line. In walking over the track, we observed all the curves we passed over, for degree of elevation and amount of wear. I formed the opinion that it took more time to get freight trains under motion, and make station stops, than passenger.

The freight trains on which we rode did not take sidings at any time during their trip. When the engine was doing stational work,

the train stood on the main track. The longest time I have in mind that the freight train kept the main line while the locomotive was doing stational work was an hour and forty-two minutes, which was at Trout Creek. During that time, the locomotive was switching in the yard, and standing with the peddler cars unloading freight. The caboose and several cars ahead stood on the main line.

On our trip, L'Anse to Houghton, on the local, the train kept the main track clear through to the Houghton yard, and the longest stop we made was at Chassell, where the engine switched in the lumber yard tracks and did work at the freight station, while the caboose and rear end of the train kept the main track. While making stops at stations, the locomotive was working part of the time and standing still part. On entering a station, they usually stop the peddler car in front of the freight house, at which local freight was loaded and unloaded. If any switching was to be done, part of the crew would cut the engine off and work on the siding, switching out and placing cars, the balance being engaged in handling local
1493 freight.

(Agreed that, of the expenses of Mackinaw Transportation Co., June 1, 1912, to April 20, 1913, Soo Line paid $12,365.62 and D. S. S. & A. $18,310.80, of a total net expense of $30,676.42. In addition, D. S. S. & A. paid $50,911.46 on the new boat and contributions to boat replacement, making a total for D. S. S. & A. of $69,222.26.)

(Admitted by plaintiff that in minority report at 1914 session of American Railway Engineering Association, C. P. Howard being one of the signers, the statement was made:)

"Last year the attempt was made to divide the expense of maintenance between passenger and freight, using a multiple two for passenger tons. Because this multiple was rejected by the association as not proven does not minimize the importance of securing information on the subject."

1494 *Testimony Before the Court (on the Trial).*

1495 GEORGE L. FOWLER, a witness for plaintiff, produced before the Court on Nov. 20, 1917.

Direct examination.

By Mr. Eldredge:

I live in New York City; am 62 years old. I am a consulting engineer, without the degree of Mechanical Engineer. I am a graduate of Amherst, have taken the course of mechanical engineering in Columbia University, and have been in mechanical work all my life.

On leaving college, I entered a machine shop engaged in manufacturing cars and running gear, and learned the machinists' trade. I then went to the Industrial Works of Bay City Mich., in charge of their drawing department, manufacturing excavators, pile drivers,

and similar machinery. Then I was assistant to Master Mechanic on the old Flint & Pere Marquette Railroad, at Saginaw, Mich.; afterwards, Superintendent of the A. T. Bartlett Co. of Saginaw; and since then I have been Superintendent of the Peckham Truck Mfg. Co. of Kingston, N. Y., and since I have been engaged in mechanical work, research work mostly, in regard to cars, locomotives and railroad work generally.

I am able to value locomotive engines and determine their condition; I was employed by plaintiff for that purpose, going to Marquette, last September, 1917.

I made a personal inspection of all the engines that ran into Marquette, and the switching engines at Ishpeming and Negaunee, making a careful external examination of all such parts of those engines as were easily accessible without having the engines dismantled. I think I saw and examined 45 engines out of a total of 78. I went to the records of the company and examined in detail the repair costs for labor and material of every engine on the road, and,
1496 inasmuch as repairs for the engines which I did not see were right on a par with those which I saw, I assumed that their physical condition would be at least as good as those which I had the privilege of examining. I had an opportunity to examine the interior of boilers that were in the shops for general repairs, and went over the scrap heap, and looked up the matter of the tubes which had been removed. I also saw a number of the engines which had been washed out, and the general condition of the water at the same time. The 45 engines which I examined included every type of engine now in use on this road. After making this examination and obtaining this data, I made a valuation of every locomotive, which valuation is shown on plaintiff's Ex. 211.

I made a similar valuation of the passenger train cars, which is shown on plaintiff's Ex. 212. I first made an inspection of such passenger train cars as were accessible at Marquette, and also went out to Michigamme to make an inspection of the cars which were standon the track there, and which did not come into Marquette. That included every type of passenger train car that was in use upon the road. I inspected those cars as they came through on the through trains, sometimes making several visits to the same train, in order to have time to take the whole train. And also the cars that were standing in the passenger yard at Marquette. I made the inspection in essentially the same way that I did the locomotives. I looked over the trucks, the under framing of the car, condition of the interior, condition of the floor, condition of the platforms, couplers, air brakes, and everything that was visible to an ordinary inspection, and then wrote in my books the memorandum of my opinion of the physical condition of the cars.

I assumed the condition value of the cars for 1913 to be the same as that set down by Mr. Riggs in 1913, and then, in order
1496a to obtain the reproduction value of the cars, I found that the Barney & Smith Car Co. of Dayton, Ohio, had built a large number of cars for the company, and I went to them for estimates of the cost of reproduction of those cars for the years 1914,

1915, 1916 and 1917. They made such an estimate, and gave me access to copies which I have, original copies of all of the figures upon which that estimate was based. The result was that the estimate which they furnished and which I have checked off from their original figures agrees exactly with the Riggs valuation for 1913. I then took their figures, or took these figures for 1914, 1915, 1916 and 1917, and wrote them in after these figures.

Then I took the percentage of increase for each class of rolling stock. For example, you take a first class coach and take the percentage of increase as obtained from the Barney & Smith Co. for the first class coach which they made the figures on for 1914. It was about six per cent, I think, in advance, something of that sort. Then for 1915 I took their figure in advance, and for 1916 and 1917. Then I applied that percentage of change of value to all of the other first class coaches on that road for which I did not obtain a direct estimate, applied that percentage of change of value to the Riggs valuation of 1913, and in that way I wrote in reproduction cost of each individual car on the road for the four following years. Then in order to obtain the current value, present value, as it is marked on the schedule, I took the condition valuation of Riggs for 1913 and applied the Master Car Builders' rules of depreciation for the depreciation of passenger car rolling stock. That rule is that the depreciation shall be straight three per cent per annum down to 50% beyond which there shall be no further depreciation, so that when I found a car on the Riggs valuation where he had given it a 50% value in 1913, I wrote "No further depreciation" on
1496*b* that car, but for cars where he had a higher value, 70%, 80% or 90% or whatever it might be, on those cars I deducted three per cent per annum for the four years, making a total of 12% for the valuation of 1917, and in that way obtained the value—the current value—of each car in the passenger train equipment of the road.

I examined 35 out of 72 cars, and found no car in less than 50% condition, so far as my own examination of its physical condition was concerned.

I also made a valuation of freight train cars, shown on plaintiff's Ex. 213, and shop machinery and tools, shown on plaintiff's Ex. 214.

For freight train cars in service in 1913, I assumed the Riggs valuation of 1913 as a basis, obtained manufacturers' prices for 1914, 1915, 1916 and 1917, and increased the Riggs cost of reproduction values accordingly. I used the Riggs condition valuation of 1913 as a basis to determine condition, and successively for each year thereafter subtracted for further depreciation according to the Master Car Builders' rule, with a minimum of 20%.

For shop machinery, I obtained scales of variance in prices for the years 1914, 1915, 1916 and 1917, and increased Riggs' 1913 values 40% accordingly. I then, to ascertain present value, applied the Riggs percentages of depreciation, no additional depreciation being allowed.

1496*c* As the result of my inspection, I made a memorandum of what I considered to be the physical condition of the engines; also of what I considered their value condition, on the basis

of the general character of the engines with reference to age and possible obsolescence. I mean by obsolescence an engine that is old and not up to the present design, so that if the railroad company were to purchase new rolling stock, they would not buy an engine of that character. Obsolescence is the only necessary depreciation, except a slight depreciation due to wear, but an engine properly maintained can be held up to its original working or physical condition through an indefinite life.

I then assumed the condition value of the engines as given by Riggs in 1913. Then, learning that the D. S. S. & A. allowed 2.5% per year depreciation on engines, and that appearing to me to be a reasonable amount, I deducted 2.5% per year from Riggs' condition value, allowing 2.5% for 1914, 5% for 1915, 7.5% for 1916 and 10% for 1917. The prices I used for engines were the average for the fiscal years.

I did not examine the locomotives for the specific purpose of confirming Riggs' values and figures.

FOWLER.

Cross-examination.

By Mr. Wykes:

I was limited by the condition value fixed by Riggs in 1913, and the depreciation allowed from that took care of the value of the engines automatically, regardless of my opinion as to its physical condition. The only thing I wanted to be sure of was that the physical conditions as I found them were as great or higher than the value conditions which would automatically come in with the allowance of the depreciation which I was giving to the engines. The 25% and high depreciation which I allowed was to take into consideration the obsolescence and decreasing physical condition.

I started with Riggs' fixed percentage, assuming that that percentage represented the condition of the locomotive, taking
1496*d* into account obsolescence at the time. I then went through the mathematical computation of cutting it down 2.5% per year. I assumed that Riggs allowed for obsolescence. If he did not, I did not understand the basis of his figures which I have taken.

My prices I obtained from the American Locomotive Co., telling them the purpose for which I was getting the figures. I did not attempt to get a price for the purpose of purchasing.

I paid no attention, whatever, to the cost prices of the engines in making my estimates. In making my valuation of locomotives, I was not interested in knowing what second-hand locomotives sold by the company were actually sold for. It was immaterial, as far as my work was concerned.

My values for locomotives for 1914-1917 were entirely independent of those of Mr. Riggs for 1913, except that I used and carried through the Riggs percentage of condition with the annual reduction of 2.5%. I did that because I believed Riggs had allowed for obsolescence in his condition value, and I was willing to accept that because of obso-

lescence, but, if Riggs did not allow obsolescence, then I allowed down to his percentage plus the depreciation, in addition to that.

I did not investigate to ascertain the cost to the company of the new locomotives purchased in 1913. I paid no attention to the 1913 valuations. The only thing I did do there was to use their condition value in 1913 as the basis for the additional depreciation. The 15 locomotives, after four years of use, are valued by me in 1917 at 30% more than they cost in 1913.

1497 NELSON CADERETTE, a witness for plaintiff produced before the Court, Nov. 20, 1917.

Direct examination.

By Mr. Tracy:

I am 46 years old, reside at Duluth, and am assistant engineer of plaintiff, having been in its employ continuously for 26 years as draughtsman, engineer of maintenance and construction on the road and in the office. In 1911 and 1913 I assisted Mr. Riggs in making and revising his inventories and valuation of plaintiff's railroad, and in 1916 started and am still working on the inventory of the road for valuation purposes for the I. C. C. In the latter I had charge of making maps and profiles and seeing that field parties took the proper quantities of materials. In the last 15 years have been over the line 2 or 3 times a month; it is a part of my duty to look for defects in the track and other things needing reporting.

I have prepared an exhibit (Pltf.'s Ex. 201) bringing the Master's valuation of June 30, 1913, down to date. My work continuously since August 1917, has consisted in making an inspection of the several structures and obtaining from records lists of property added and retired. I attempted to ascertain the condition as to depreciation. The first sheet of Ex. 201, shows the property divided into 43 schedules, the columns being: first column, list of schedules; second column, Master's valuation as of June 30, 1913, subdivided as to services. Third column, value of property retired since June 30, 1913, at the Master's values, the data being obtained from our records; fourth column, value of property added since June 30, either at cost or at average prices for 1917. The prices were obtained either from

1498 records of purchases or by consultation with engineers Young of L. S. & I., Loweth of C. M. & St. P. and Lewis of South Shore, and my personal knowledge of unit prices; fifth column indicates the Master's quantities less retirements, computing the remaining quantities at 1917 unit prices; column sixth is the total of columns four and five and is the total value of the different schedules for June 30, 1917.

Schedule 1, Right of Way and Station Grounds, includes all the land used for railroad purposes, and figures on page 1, of plaintiff's Ex. 201, shows additions and retirements correctly. Schedule 3, grading, includes clearing, grubbing, grading, excavation, embankment, retaining walls and riprap.

The retirements and additions are correctly shown.

The unit prices applied to items included under grading, appear on Sheet 12 of plaintiff's Ex. 201, and are there compared with those found by the Master, the price being 40¢ for grading, including overhaul and shrinkage. The prices used are made up of the average cost of labor and material for 1917 applied as of June 30. I made a study of the correctness of these unit prices and in my opinion they are reasonable and somewhat too low.

Actual prices paid by us for contract work on connecting track between the Negaunee and Palmer track to Winthrop track of the C. & N. W. in 1917, were clearing $60 and grubbing $264 per acre, grading 50¢ for earth, 75¢ for loose rock and $2.50 for solid rock per cubic yard. I did not use these prices as I thought this a small hurry-up job, and I did not think them a good average, though the work could not have been done much cheaper.

I depreciated no items of schedule 3 and except retaining walls which were depreciated upon my personal inspection.

Schedule 5, Bridges, Trestles and Culverts, consists of steel, iron, concrete and wood structures. Steel bridges are valued by applying a price per pound in place; the wooden bridges by a unit price
1499 per thousand feet of timber in place. Page 1, of Pltf.'s Ex. 201, properly shows the bridges retired and added since 1913. In instances the additions are put in at actual cost (four instances) and in others on new unit prices. The unit prices used on bridges appear on sheet 12 of Pltf.'s Ex. 201. The $49 per thousand used for wooden bridges, consists of timber f. o. b. Superior per M. $32; freight 64¢, loading and unloading $1.50; labor, framing and erecting $15, total $49.14 per thousand. The Master used the same elements but I increased some of the base prices due to the increased cost of labor and materials. I simply attempted to bring appraisal values of 1913 down to date. In putting a new bridge in place of an old one, the charge to additions and betterments is the difference between the cost of the new and the value of the old bridge in use and in place. I merely took the bridges retired off the Master's list at his valuation and added the new bridges at the new values. I think the unit prices for bridges are fair and reasonable. The percentage of condition of schedule 3 was found by inspection and a study of the repairs and as the bridges have had four years' use the general effect is lower than the Master's percentage of condition.

Schedule 6, Ties: these are inventoried at so many per mile and the percentages to the total determined by inspection, as cedar 18%, hemlock 59%, tamarack 23%. That is a fair average of our ties. Additions and retirements were made as described. Unit prices for 1917 were taken from the Company's records and I used an average of 35.8¢, made up of cedar 41.72¢, hemlock 34.63¢, tamarack 34.35¢; the 35.8¢ was a weighted average. To this I added 9¢ per tie for hauling, loading and unloading but nothing for inspection. The Master added 6¢; my 50% increase is caused by the increased
1500 cost of labor, train equipment, coal, etc., I did not change the percentage of condition from the Master's 55%.

To the best of my knowledge ties were in practically the same condition in 1917 as in 1913. From June 30, 1913, to June 30, 1917, 54% of the Master's quantity of ties, or 725,976 new ties were put in on main line in Michigan. We replace ties when they get close to 50%. They could not be used longer as they decay and spikes won't hold. A tie is worth nothing after taken out. The normal condition would average 50%. I think the Master's 55% would be low enough and on account of the 54% of new ties put in; I left the condition as he found it. Eight years is about the life of such ties as are used on D. S. S. & A. Some will not last near as long and cedar lasts longer. An average of 6 years is about the life of a hemlock or tamarack tie. The average life of all the ties, including cedar, on the D. S. S. & A. is not over eight years.

Schedule 7, Rail, taking the Master's quantities, I deducted the retirements, applied unit prices and added the additions. The unit price was based on rail at Chicago, $38 plus the tariff rate to Marquette $2.25, transportation on our line 60¢, unloading and handling 30¢, inspection 10¢, total $41.25 per ton, which was applied to all tonnage of the line. I obtained the base price from the Purchasing Department. The rail is depreciated down to scrap value. I fixed $30 per ton for scrap which is a fair average or low. We sold some as high as $42.50 a ton in 1917. To arrive at percent of condition I used the Master's condition percentage as a basis and deducted 2.5% a year. I think that a fair average.

Schedule 8, Track Fastenings. We applied a certain number per mile of track to ascertain quantity. Where track was retired
1501 I retired the fastenings and where new rail was put in I put in new fastenings. The unit prices, stated on sheet 12 of Plt.'s Ex. 201, were obtained from records of bridges, consultations with other engineers and my own knowledge. I depreciated the same as rail allowing scrap value to a*b*gle bars only. Schedule 9, Frogs, Switches and Crossings, was handled and depreciated the same as track fastenings and I thought the 1917 price fair and reasonable.

Schedule 10, Ballast. The quantities are the same as the Master's except on branches retired and added. About 95 miles of the track has been reballasted but to be conservative I assumed that would make good depreciation and did not add it. The Master figured 9 inches for gravel and 6 inches for cinder ballast under the tie. The I. C. C. in 1916, made test pits, about one every mile, to ascertain the amount of ballast. In soft places, east of Marquette, through Seney Swamp, they found 18 to 24 inches of St. Ignace gravel below top of tie, on the average. I applied prices of 80 cents for gravel and stamp sand and 45 cents for sand and cinders per yard.

Schedule 11, Track Laying and Surfacing. This is a labor item including laying ties and rails and surfacing the ballast. I took the Master's mileage and increased his price 50%—$600 to $900 per mile.

Schedule 12, Fencing. I used the Master's quantities, added additional fence, deducted 10% from Master's condition and applied new unit price, based on cost in fall of 1916. In my judgment the

prices used represent a good average. The 10% I think sufficient depreciation.

Schedule 13, Crossings, Cattle Guards and Signs. I treated this about the same as fencing and increased the Master's price
1502 25% in some and 50% or 60% in other cases, based on my experience, on purchases and consultation with other engineers, of the cost of labor and material.

Schedule 14, Interlocking and Signal Apparatus. The additions and retirements in Pltf.'s Ex. 201 are correct.

Schedule 15, Telegraph and Telephone. I treated entirely as a labor item as the telegraph company owns all material and plaintiff constructed. I increased the Master's price 50% and reduced his per cent condition from 70% to 65%, using my judgment. We maintain the telegraph line and have spent sufficient to maintain it in practically the same condition as in 1913.

Schedule 16, Side Track. The price includes the grading and all track material in place. They include all tracks, except main line and traffic spurs. I used the Master's quantities for side track, deducted retirements and added additions. I applied the same unit price as applied to the separate elements entering into side tracks and reached a price of $6,850 per mile. The same per cent of condition was applied as on similar material in other track but ties were put lower, because of culls being used.

Schedule 17, Stations, Buildings and Fixtures. From the Master's inventory I deducted retirements and used the balance. There has been increase in the cost of building materials since 1913.

Schedule 19, Shops, Engine Houses and Turntables. This — handled the same as Station Buildings by applying additions and retirements to Master's valuation but making no recomputation of new unit prices. The condition was as good in 1917 as 1913.

Schedule 20, Shop Machinery and Tools. I used Mr. Fowler's figures having furnished him with the additions. The correct
1503 amount is $150,599 including additions of $4,903. This corrects an error in Mr. Fowler's figures due to an omission.

Schedule 21, Roadway and Construction Tools. I took the Master's quantities and conditions to reach 1917. They are being kept on an equally good standard as in 1913. I increased the values 60% due to increase in costs. Track shovels and tool steel have gone up 100% to 400%.

Schedule 22, Water Stations. Pltf.'s Ex. 201 correctly shows additions and retirements. Upon prices obtained by purchases of material and consultation with engineers I used for tank complete without pumping station $2,167.00. We constructed one in 1916 at a cost of $2,502.

Schedule 23, Fuel Stations. I valued these the same as for bridges, using new unit price, which I think a fair average. The additions and retirements are correct.

Schedule 26, Docks and Wharves. The figures were stipulated.

Schedule 27, Electric Plants. Additions are correctly shown. I added 50% to the Master's values for increased cost of labor and materials.

Schedule 28, Miscellaneous Structures. The exhibit correctly shows additions and retirements. There was no attempt to recompute the values. Considering increased cost and repairs the percentage of condition as good in 1917 as in 1913.

Schedule 29, Engineering on Roadway and Structures. I increased the Master's allowance 30% to cover increased cost of labor.

Schedule 30, Locomotives. I furnished Mr. Fowler the retirements and additions and took his values. I apportioned the value of
1504 locomotives to services upon information obtained from the movement of each locomotive in the time book. The plan followed was the same as in Pltf.'s Ex. 81. My apportionment was correct according to mileage.

Schedule 31, Passenger Train Cars, I furnished Mr. Fowler the additions and retirements and apportioned the value to Michigan on percentages furnished by Relf. The total before apportionment was $407,193.

Schedule 32, Freight Train Cars. What I did was the same as for passenger cars. For cars in service a part of the year I used an apportioned value based on time.

Schedule 33, Miscellaneous Equipment. Using the Master's unit prices for 1913 I increased the value in the same proportion as used by Mr. Fowler and depreciated according to the depreciation charged off on the Company's books. I think 2.5% per year; added items I put in at cost. Pltf.'s Ex. 201 correctly shows retirements and additions. They were proportioned to states on percentages obtained from Delf. The percentage of condition used was a fair average for June 30, 1917, and the prices are fair.

Schedule 34, Ferries and Steam Ships. The value was stipulated.

Schedule 35, Engineering on Equipment. The Master allowed 2% of all schedules 30, 31, 32, 33 and I increased his allowance 30% to 2.6%.

Schedule 36, Terminals. I increased the grading price only. I figured repairs and increased costs would maintain the Master's percent of condition.

Schedule 37, Contingencies; 38 Legal Expenses; 39 Organization and Administraiton; 40 Taxes, and 41 Furniture and Fixtures. Were included at the same amounts as allowed by the Master.

1505 Schedule 30, Interest During Construction. I applied the Master's rates to the new amounts arrived at by me according to his formula on pages 197-198 of his report.

Schedule 42, Stores and Supplies. For 1917 I took the average of the inventories for the fiscal years: 1914, $390,145; 1915, $326,113; 1916, $392,828; 1917, $571,980. The average used I separated to freight, passenger and common on the proportions of the inventory of appraisal attributed to each. Fuel varies greatly, being low in spring and much larger at the close of navigation. This year we have a large stock of track material on hand. The item was proportioned between states on the percentages of road miles.

Schedule 43, Working Capital. This represents monthly balances for four years, 1914-1917. I apportioned to Michigan on the basis of track miles.

The item Appreciation was taken as allowed by the Master and apportioned to services on the same ratio as Sch. 3, Grading.

The unit prices I used appear on page 12, Pltf.'s Ex. 201. I am familiar with prices of labor and material on our line 1914-1916. They were higher in all three years than used by the Master for 1913. As regards the extent of depreciation, the road was in better condition in 1914 as compared with 1913, in 1915 as compared with 1914, and in 1916 as compared with 1915. We have kept making improvements right along.

Cross-examination.

By Mr. Wykes:

Plaintiff's Ex. 201, was prepared exclusively for this case; it starts with the Master's value, then excludes retired property, then
1503 adds additions, then affects the quantities with 1917 prices. In some cases, where previously mentioned, I have used cost prices. The increases shown, due solely to price increases 1913 to 1917, is the difference between columns 2 and 3 and then subtracting the balance from Column 5, or approximately $3,130,714, with adjustments which will further increase due to stipulations, the Soo Bridge, depreciation, etc. For added property I have used cost price where mentioned. The actual cost price for all added property could be taken from the additions and betterments account. I understand the amount reported to the State as additions and betterments would be the amount of new property not paid for by operating expenses. I presume the cumulated figures from the reports 1914-1917 of net amounts of additions and betterments would bring the value down to date. The increase in grading of $1,000,000 due to increased price would increase the schedule, Interest During Construction, $90,000. Messrs. Young, Loweth and I, agreed 30% increase for Enginering During Construction would be right. I said the property in 1914 and subsequent years was in better condition than in 1913, because the maintenance was sufficient. The further depreciation where I allowed it was to be conservative. Notwithstanding I decreased some items, other items such as new and increased weight of rail would be on the up-grade and becoming better all the time. In those years we relaid considerable 60 Lb. with 80 lb. rail. The old rail was too light for the traffic; we have a lot more to change; we got new and heavier locomotives. In replacing 60 lb. with 80 lb. rail about 25% of the cost of the new rail would go to Additions and Betterments and 75% to Operating Expenses, regardless of the fact that the rail taken out was in a depreciated condition and had cost—say
1507 $30. I made no special investigation of increased prices of materials, comparing 1913 with subsequent years, but they are just my general idea. I do not know whether 1915 prices fell below 1914. I did not furnish Mr. Fowler the sales prices of locomotives retired and made no investigation of sales prices or amounts received for locomotives scrapped. I know the price of certain track material remained constant up to 1916. My tie prices used for 1917

were taken as the prices for that year. Averaging the four years back to 1913, the result would have been lower. The appraisal, Pltf.'s Ex. 201, as a whole would have been less for 1917 had the four years after 1913 been averaged. I added for no items omitted by the Master, Riggs or Hansel. I do not recall any but there might have been some. I did not find any omission of sufficient importance to mention.

I made the price of 40¢ for grading sufficiently high to cover the two items, Overhaul and Shrinkage. The 9¢ added to the average cost of ties of 35.8¢ covers hauling, loading and unloading charges. If the I. C. C. rule includes unloading in track laying and surfacing, that would already be taken care of in the prices allowed and that is true also of hauling and loading.

The work on the Negaunee and Palmer Branch mentioned was by contract but not on bids and the job was submitted to but one person. Bids often vary 40% between the high and low, but it was hard to find any one to do the work that year. The country there was rough, the work confined to one big cut classified as earth, loose rock and solid rock and the haul 700 or 800 feet. The grading amounted to about $4,000 and was not done by steam shovel. I would not think the instance typical. The $900 per mile for track laying and surfacing was determined by Young and Loweth; I did not analyze its elements. For ballast increase I also took their prices. On bridges,
1508 the bridge at Brimley, in place 3½ years the conditions taken were: steel 98%, bridge ties and guard rails, 95%, and remainder of structure 100%. I started this bridge new and depreciated to be conservative.

The excavation and back fill of bridges we did not depreciate with the structure, though to replace it some of the work would be done over again. The cost of additions and betterments made since 1913 is in all instances materially less than the figures I have placed in 1917 values and in many instances as much as a 50% increase has been made. I have taken no structures at less than cost; ordinarily the depreciation I allowed is not enough to reduce the additions from the value included to cost. The inventory of stores and supplies would include those for the purpose of making additions and betterments as well as those for the purpose of maintenance. There is no way I can separate. Though some of the stores and supplies material has been used it is considered as good as new. The base prices for ties are the same figures as reported to the Railroad Commission. To their average I added 9¢ per tie. I understand the report prices include inspection only, but I do not know.

Redirect examination.

By Mr. Tracy:

In Pltf.'s Ex. 201, I took actual cost for each addition so indicated.

1509 NELSON CADERETTE, recalled.

Direct examination.

By Mr. Tracy:

The correct item for Schedule 31, Passenger Train Cars for Michigan is $333,584; for Miscellaneous Equipment $74,316.

Cross-examination:

The shops and shop property located in Michigan are used in repairing all the cars of the line and ail assigned to Michigan as being located there. The Thomaston water and fuel stations furnish water and fuel for locomotives running out of the state but they are all assigned to Michigan.

1510 NELSON CADERETTE recalled.

Direct examination.

By Mr. Tracy:

(Corrected copies of the plaintiff's (Fowler) Exs. 211, 211*a*, 212, and 213, produced.)

Pltf.'s Exs. 201*a*, 1914, 201*b*, 1915; and 201*c*, 1916, are computations to find the value of plaintiff's Michigan property based on the Master's valuation plus the additions and retirements in each year. I took the Master's values for 1913, deducted retirements at his depreciated value and added additions at cost,, where they were shown in Pltf.'s Ex. 201, or at the Master's unit prices where costs were not shown. That applied to all except the equipment schedules and for those I took Mr. Fowler's valuation. The retirements and additions shown are those shown on Pltf.'s Ex. 201. The divisions between passenger and freight and inter an intra state passenger were made by Mr. Delf.

In assigning the locomotives to states and services the 1913 locomotive mileage from the time books was used for 1914, 1915 and 1916, as that gave a less percentage to Michigan than 1917, would have done and we had no data collected for those years. The locomotive values given by Mr. Fowler were for such locomotives as were on the line in 1917 and for 1914, 1915-1916, I have added the locomotives in use at those times but since retired; I added these in at the depreciated values of the Master for the months in use only, e. g. for a locomotive in service in 1913 continuing to 1916, not valued by Mr. Fowler, I took the Master's values and depreciated it 2.5%.

(Pltf.'s Exs. 201*a-c* introduced in evidence.)

Cross-examination.

By Mr. Wykes:

1511 The figures used for additions from year to year are not the same as reported to the State Boards, which were used by the State in bringing its exhibits to date. They are computed by taking the cost where I could obtain it. I am not sure that would be the figure reported to the State. In other instances they were computed at the unit prices. I made such allocations of property as were made. In the division between freight, common and passenger I carried forward the divisions as divided in Pltf.'s Ex. 201. These exhibits are entirely assembled from Pltf.'s Ex. 201. In the preparation of Ex. 201 where I used unit prices instead of costs I was instructed to take that way as the costs were not available in the company's books in such a way that I could get at it. Many items of cost do not enter into our books at all, e. g. over head expenses.

Dedirect examination:

I did not take costs, in making up Pltf.'s Ex. 201, in making additions as I computed new unit prices according to the higher values of 1917. These amended exhibits 201*a*-201*c* were made within the past week.

1512 A. E. DELF, recalled; a witness for plaintiff, before the Court on Nov. —, 1917.

Direct examination.

By Mr. Tracy:

Age, residence and qualifications previously given.

Under the I. C. C. method of accounting when an old bridge is replaced with a new one, the cost of the new structure is charged to the capital account "Road." The ledger cost of the structure retired, if known, or the estimated cost if not known, is charged to operating expenses, the same amount is credited to "Road" and the salvage adjusted. If between 1913 and 1917 new bridges have replaced old ones, that would show up in operating expenses and additions and betterments.

Referring to Schedule 5, Pltf.'s Ex. 201, the expenditures on account of bridges, trestles and culverts, operating expenses (1914, $45,886) and additions and betterments (1914, $36,000+) would practically equal the aggregate amount specified as additions.

Where rail is replaced with new rail of the same weight the entire cost is charged to operating expenses and the same account credited with the value of the rail taken out, making no charge to road; if the new rail is of heavier weight, the difference in weight is charged to road and the remainder to operating expenses. Inventories as of June 30, each year, are kept of stores and supplies showing new

material at cost and old rail at scrap prices. The coal supply is lowest in June and highest at the close of navigation. We now (Nov. 1917) have on hand about $400,000 worth or 70,000 tons, but a small portion of which is represented in the 1917 inventory. It will be consumed before the inventory of June 30, 1918. The ties purchased during fall and winter are in greater part put into the track by June 30. The prices reported to the Commission included the ties along side the track and the inspection cost
1513 before they are moved. They are charged out of the material account when they are actually put into the track. The working capital figures furnished Mr. Caderette are the average monthly balances 1914-1917, not taking into account deposits in connection with this case. They include items accumulated for interest payments. We have had to use this reserve for operating purposes and to borrow money besides. As comptroller I find it necessary to have on hand for working capital the sum set forth in Pltf.'s Ex. 201.

1514 A. E. DELF recalled.

Values for equipment and other items shown in Pltf.'s Ex. 201 was apportioned between states, passenger cars on passenger car mileage; sleeping, dining and observation cars on their respective mileages; freight cars on freight car mileage, and miscellaneous equipment, stores and supplies and working capital on track miles of main line and branches. Ratios of road and car miles are found on page 1 of Pltf.'s Ex. 205. The division by me of Michigan common property between "passenger," and "freight" is shown on sheet 1 of Pltf.'s Ex. 201; Schedule 19, Shops, Engine Houses and Turntables, was divided into shops $50,067 and engine houses and turntables $168,679; shops were assigned to passenger and freight on the relation of repairs, to (308) locomotives and (314) freight, (317) passenger and (326) work cars, as shown on D4 of Pltf.'s Ex. 210, 29.26% to passenger. Account is kept of the expenses of repairs to the various classes of equipment and I divided the value of the shops themselves between passenger and freight on the relation of work done in them.

Engine houses and turntables were then subdivided to yard engines, 19*a* and road engines 19*b* on the relation of accounts 398 and 400; the amount assigned to yard was divided between passenger and freight, on the relation of the division of account 388 or passenger 2.09%; the amount assigned to road engines was divided on the relation of account 400, engine house expenses road, or passenger 30.02%.

Schedules 20, Shop Machinery and Tools, 42 Stores and Supplies, and 43 Working Capital, were all divided on the relation of the totals arising from the division of all other property schedules except 20, 21, 42, 43, 37 and 40—the overhead basis.

1515 Schedules 22, Water Stations, and 23, Fuel Stations, were divided on the basis of (*d*16) the fuel used in passenger and freight services as shown on page 8 of Pltf.'s Ex. 210. These

methods were to divide on the basis of the use made in the different services.

With the exception of the schedules above mentioned and 37 Contingencies and 40 Taxes, the common property was divided to passenger and freight on the modified revenue train mile ratio shown in Pltf.'s Ex. 210, p. 1. This ratio is made up on the one hand of (*a*) the revenue freight train miles, (*b*) the freight train switching locomotive miles on common tracks computed from time spent in switching, at six miles per hour; the amount of time spent on common tracks was made up on a series of tests by conductors in 1917 in which it was determined that 58.94% of the switching time of freight trains was on common track. The tests were with the cooperation of the defendants and the percentage agreed to; (*c*) the freight yard locomotive switching on common tracks, obtained by similar tests, the percentage being agreed to by state representatives.

On the passenger side there is (*a*) the Michigan revenue passenger train miles and (*b*) Michigan passenger train locomotive switching on common tracks, the proportion of time being obtained by tests agreed to by the state, plus (*c*) the mileage of C. & N. W. and C. M. & St. P. trains. These for 1917 gave a total freight train and switching miles of 1,080,134 miles and passenger train and switching of 788,806 miles, or a ratio of 42.41% for passenger of the total train and switch miles. This ratio for the division of common property between passenger and freight was used as it represents the actual use of property by the two classes of trains showing the relation by the respective mileages. The division ignores time weight
1516 and speed. The weight has nothing to do with the use of the property. In the case of a passenger train over 100 miles of track at 27 miles an hour followed by a freight train at 16 miles an hour each would have one complete use of the entire property. The theory is that the revenue train mile represents the unit of use without reference to the destruction of the property, that being taken care of in the division of maintenance cost. The switching done on common tracks only was used, as the ratio is used only to divide common property, the exclusive freight property having been allocated to freight service.

Schedule 37, Contingencies, was divided on the relation of the divisions of all other schedules except 1, 37 and 40; schedule 40, Taxes, was divided on the relation of totals of all other schedules except 1, 34, 36 and 40 Taxes. The details of the division of common property are shown on the right of sheet 1, of Pltf.'s Ex. 201. The Michigan passenger property was assigned to interstate and intrastate in the relation borne by the passengers carried one mile in each service to the total passengers one mile, or for 1917, 70.67% intrastate and 29.33% interstate, as shown on Pltf.'s Ex. 205, page 8. The total value of property devoted to Michigan intrastate passenger service is given as $3,935,976. (Pltf.'s Ex. 201 offered in evidence.) Pltf.'s Exs. 214-219 inclusive, are Interstate Commerce Commission classifications containing the rules, regulations and instructions by which the plaintiff's accounts are kept. (These exhibits received in evidence.)

Pltf.'s Exs. 202, 203, 204 and 205 are plaintiff's operating statistics used in the various separations of accounts for the years 1914, 1915, 1916 and 1917, respectively, being actual figures taken from the accounts and largely self explanatory. (These exhibits re-
1517 ceived in evidence.)

At the bottom of page 6 of Pltf.'s Ex. 202 "operating expenses" should read "passenger statistics," the rate per passenger per mile should read "cents" and results from the division of the total passenger revenue by the total passenger miles. This represents actual receipts including all classes of travel and mileage books and children.

On page 11 of Pltf.'s Ex. 202, the estimated loss by application of the two cent rate act was arrived at. We analyzed the traffic as to children and adults less than 5 miles, for 1910 and 1913 and it is agreed that the same ratio may be applied to subsequent years. We ascertained the amount that would be obtained by the plaintiff at two cents per mile, computing children at half fare, the trips of five miles or less at three cents and the excess over two cents to be obtained on certain interchange business at actual rates and the remainder at two cents per mile, which gave the amount which would be received on a two cent basis; this subtracted from the amount actually received on a three cent basis represents the loss of $131,299 on the intrastate business had the rate been enforced. We do not take into account any increase or simulation of business by the reduction of fare. All the statistics in Pltf.'s Exs. 201-5 (1914-1917) taken from our books, represent the operations of the road.

On page 15 of Pltf.'s Ex. 204, 1916, is a statement of the statistics of travel in Michigan on D. S. S. & A. sleeping cars, giving the number of passengers and passenger miles and revenues in business. They also show the details for foreign sleepers. The only revenue that comes from the foreign sleepers is the proportion of passenger fares, though we get a rental, as will be later explained. We get
1518 all the transportation revenue earned on our lines in those sleepers but none of the sleeping car revenue. We get a hauling charge from the C. & N. W. and C. M. & St. P. Pltf.'s Ex. 205, 1917, contains the same information as 204; Exs. 203-205 are taken from our books and correctly show the statistics they purport to show.

Pltf.'s Ex. 209 covers year ending June 30, 1917; pages 1-4 contain the operating expenses for the entire line and for Michigan and the passenger operating expenses in Michigan. Page 5 shows results of the passenger business in Michigan for that year including total income, expenses, rents, taxes and other payments, the net income, the deduction of the estimated loss and for mail and express and the final figures, the result of the operations if Act 276 had been made effective.

Describing page 1 of Pltf.'s Ex. 209: The first column headed "Account Number" shows the number of the account as designated by the Interstate Commerce Commission. The next column the title of the account.

The third column shows the amount of operating expenses assignable to each of the accounts for the entire line.

The fourth column shows the proportion of the operating expenses assignable to the State of Michigan.

The fifth column shows the proportion of those expenses directly assignable to passenger.

The sixth and seventh columns the portion of the Michigan operating expenses that are common to both freight and passenger, not directly assignable to either service.

The eighth column the percentage proportion of columns 6 and 7 that has been assigned to passenger.

The ninth column has reference to the division, showing how that percentage is arrived at.

1519 The tenth column is the amount of the common expense assigned to passenger.

The eleventh column is the sum of columns 5 and 10, or the total Michigan passenger operating expense."

The operating expenses of the railroad are divided into groups as follows: Maintenance of Way & Structures; Maintenance of Equipment; Traffic Expenses, Transportation; Miscellaneous Operations; and General Expenses.

Under maintenance of way and structures, page 1, Pltf.'s Ex. 209 in first column: "Operating Expenses Entire Line" there is no disagreement between me and the State's Accountants; in the next column "Operating Expenses in Michigan" there is a disagreement in that Mr. Parker assigns $1,986 less and Mr. Hillman $479 less to Michigan than I do. In assignment to states we have assigned the expense of the structure, e. g., Marquette shops, to the state in which located; due to a different theory they have not assigned all such expenses to Michigan. After obtaining operating expenses shown in column "Operating Expenses Michigan" the first step to divide between passenger and freight services is to allocate or definitely assign all that can be allocatably assigned. Referring to page 6 of Pltf.'s Ex. 209: to explain method adopted in 1917 to allocate maintenance expenses; in 1915 the I. C. C. required us to separate operating expenses between passenger and freight services as far as possible under rules in Pltf.'s Ex. 217; we did so and Pltf.'s Ex. 209, page 6, shows the result of the allocations and columns 5 of page 1, same exhibit, the result of passenger allocations; columns 6 and 7 on page 1 show common expenses which could not be allocated.

Instructions were issued to the various departments to make definite assignments to freight and passenger when making up

1520 their monthly expenses. In the case of the road maintenance, blue print books were made for each section, showing the tracks on that section as to freight, passenger and common, the common tracks being shown in white, freight tracks yellow, passenger tracks red. The section foremen were instructed each day to keep track of the labor and material used on each class of track and report it at the end of the month in their time books; turn the time books in to the department to compile the final distribution, and in those departments the assignment is made to the various services, freight, passenger or common.

Page 6, Pltf.'s Ex. 209, is a statement of the cost of the mainte-

nance of way and structures in Michigan, and the portion thereof definitely located to the maintenance of exclusive freight tracks and bridges in one column, and exclusive freight structures other than tracks and bridges in the second column of figures. The third column of figures shows the amount definitely located to exclusive freight structures other than tracks and bridges; the fourth column of figures the total cost of maintenance of exclusive freight tracks and bridges, and the fifth or last column, the total cost of maintenance of exclusive freight structures other than tracks and bridges.

This separation as to exclusive freight tracks, bridges and other structures was made to ascertain percentages to assign the 1914, 1915 and 1916 maintenance costs to exclusive freight tracks.

Q. Now, I will ask you whether the column footings $53,102 and $45,000 represent the amount of money as shown by the reports of the maintenance of way department which was spent in maintaining exclusive freight tracks and structures in the year 1917?

1521 A. With the exception of two of the accounts, 208 bridges, trestles and culverts and accounts 272, removing snow, sand and ice, they do.

Account 208, "Bridges, Trestles and Culverts"; in our assignments we had evidently overlooked the assignment of a bridge at Walsh's Siding to exclusive freight, and some other bridges that served two tracks, a common track and a freight track, had evidently been assigned to common, and portions should have been assigned to freight. Those errors were discovered by the accountants for the State and my attention called to them and the correction made. In the account "Removing snow, sand and ice," the assignments were made in accordance with instructions by the section men. When the accountants for the State went into the detail of it, they questioned its accuracy, calling special attention to the assignment to the Marquette yards. I do not know that there was any reason to doubt the accuracy of the assignment and the result, I do not think, represented the true condition. For instance, the main line running through the Marquette yards has leading off from it numerous freight spurs. Under the instructions, very naturally the section foremen would report that main line as common track, but a large portion of the snow shovelling of the common track would be cleaning out frogs and switches leading off from it to the freight spurs, and therefore, really would be freight—assignable to freight service rather than the common track, and it was agreed between the accountants for the State and myself that we would adopt an arbitrary assignment of one per cent of the total of that account for passenger, 29% for freight and the balance assigned to common, which was done in this year and in each of the other years, 1914, 1915 and 1916.

1522 Except for these two accounts the figures on page 6 of the Exhibit show the actual allocations to the extent as made by our maintenance force.

The next, fourth column, totaled $56,123, has opposite one or two accounts matters which was not in the preceding account; account 201 could not be definitely assigned to either service; it is all common. Account 269, "Roadway Tools and Supplies," the same; Ac-

count 271, "Small Tools and Supplies," the same; Account 276, "Stationery and Printing," the same, and 277 "Other Expenses," the same. These five accounts are all common, but a portion of the expense of those accounts should be assigned to the cost of the exclusive tracks, and they have been assigned by me on the overhead basis.

Q. And the relation of that portion of the expenses is allocated to the exclusive freight structures and tracks as compared with the total expense?

A. The total Michigan expense, yes, excluding those accounts.

In accordance with I. C. C. rules, effective July 1, 1915, we began to make assignments of track work expenses in Feb. 1916, and to June 30, 1917, definite assignments were made. We did not find the expenses of maintenance of exclusive freight tracks for other years than 1917; it was mingled in one account and was not allocated or separately reported. We therefore took the percentages which the assignments for maintenance of exclusive freight tracks in 1917 bore to the total maintenance of each of the accounts and applied that percentage to the total of the like accounts in 1914, 1915 and
1523 1916. This appears on page 7 of Pltf.'s Ex. 209. For example, Account 212, Ties, the total Michigan expenses in 1917 was $60,335, and the exclusive freight tracks portion $8,893 or 14.74% of the total. In 1916 the total tie expense was $56,379, of which we assigned 14.74% to exclusive freight and the same for 1915 and 1914. This is typical of the way assignments were made for all other accounts.

On Pltf.'s Ex. 209, the common expenses were assigned to passenger and freight, those under the caption "Common" in column (1) being upon the modified revenue train mile basis, and those in column (2) on other bases. Accounts 231, Water Stations and 233, Fuel Stations, were assigned on the relation of fuel consumption in the two services shown in Division 16. (Page 8, Pltf.'s Ex. 210.)

Account 235, Shops and Engine Houses, was divided on division D 17, shown on page 9 of that exhibit. The shop part of the expense being assigned in the relation of the equipment repair accounts—division D4—and the engine house expenses on the relation of Accounts 388 and 400 being the yard and train engine house expenses.

Account 275, Insurance, is assigned on Division 18, according to the allocation of the property on which the insurance is paid.

All other expenses under caption "Common" (2), are assigned on division 2, page 1, Pltf.'s Ex. 210, which is overhead to or in relation of, the totals of the division of all other accounts in the maintenance of way and structures group, except 201, 244, 269, 271, 274, 276, 277, 278, 279. Pltf.'s Ex. 209, page 6: the division into columns shown is not with reference to 1917 but to ascertain the ratio
1524 or total to each account that the maintenance of exclusive freight tracks was in 1917, to obtain a ratio to apply to 1914, 1915 and 1916, where we had no ratio.

Pltf.'s Ex. 219, is a track chart of Houghton division. I have found three minor errors in this, two uncorrected. The two uncorrected affected 1.85 miles or between 1 and 2% of the total freight track mileage and the effect is to increase the amount I have charged

to maintenance of exclusive freight tracks between $500 and $1000.

Ratios D16, D17 and D18 used in dividing certain common maintenance of way expenses between passenger and freight were adopted and used to divide the repairs of water and fuel stations in the relation of the passenger and freight uses of the properties, making a direct connection between the use and the repairs and dividing the repairs directly in accordance with the use. Repairs to shops and engine houses were divided in the relation that the repairs to the equipment in each service bore to each other or the total and adopted because I was able to find the use unit.

The greater portion of the common maintenance of way and structures expense items which were divided on the modified revenue train mile ratio (D1) are due to weather or the elements and that portion of the expenses should properly be assigned to passenger and freight on the use of the property by them. The balance of the expense must be divided, and while I am aware that freight trains are longer and contain more cars than passenger trains, my opinion is that owing to the greater speed of the passenger train and the track refinements required for it, the fact that in some of our passenger trains our heaviest engines are employed, and that the removal of sand, snow and ice on the common tracks is necessitated by, and causes more expense due to, the passenger than the freight service,
1525 these reasons offset the fact that the freight trains are longer and heavier and contain more cars than the passenger trains.

The locomotive ton mile method has, in a number of instances, been used to divide common maintenance of way expenses. It is the weight of the locomotive and tender load multiplied by the number of miles run. The reason for its use is that it is claimed that the great destructive element of the train is the locomotive. I have investigated the locomotive ton mile ratio as applied to plaintiff. The passenger percentage, as compared with the modified revenue train mile ratio would be:

Year.	Locomotive ton mile.	Modified revenue train mile.
1917	43.9%	42.31%
1916	46.7	44.63
1915	50.+	48.65
1914	48.2	45.09

(The correct locomotive ton mile ratio apparently excludes the tender.)

On the maintenance of way and structures expenses for 1917, Parker's assignment to passenger is $89,000 less and Hillman's $74,000 less than assigned by me. This is due principally to my division of items on the modified revenue train mile ratio (D1) and to their allocation of expenses of exclusive freight tracks by setting off 17+% of those items to such tracks. Those two differences account for the greater part of the difference between us.

Under maintenance of equipment expenses, Pltf.'s Ex. 209, page 2: there is no difference between myself and the State's Accountants in the total of the first column "Operating Expenses Entire Line."

Parker assigns $225 less and Hillman $190 more to Michigan than I do. On the total amount assigned to passenger Parker's figures were $3100 less and Hillman's $2600 less than my assignment.

1526 The difference is due to the assignment of work equipment-repairs, that item having been divided by each of us on the ratio of maintenance of way and structures accounts and we varied on those divisions.

Under traffic expenses both parties are in accord throughout.

Under transportation expenses, both parties are in accord on the first column "Operating Expenses Entire Line." In the operating expenses assigned to Michigan, Parker's figures are $5,800 less and Hillman's $4,800 less than mine. In general the difference is due to assignments in Accounts 392, Train Enginemen, and 401, Trainmen. My method was: in 1917 Account 392, automatically assigns itself to freight, passenger and mixed service and the wages of engine men who run wholly in Michigan, are assigned to Michigan. On the four trains running in two states the wages of enginemen were assigned by me according to the miles run in each state. The same general explanation applies to Account 401. On account 394, Fuel for Train Locomotives, there is a difference of about $200. In the last column, page 3, Pltf.'s Ex. 209, "Total passenger operating expenses," Parker's figures assigned $25,600 less and Hillman $24,900 less to passenger than I did. About $21,000 of this difference is due to Account 373, "Station Employees." My method was: the allocations to passenger, freight and common were agreed to. The common was assigned by me on ratio D6, which is self explanatory and gave for 1917 37.31% to passenger. It is difficult to determine a ratio to divide common expenses of station employees. In the smaller stations there is usually one or two men whose services are in both passenger and freight work and it is impossible to determine accurately the amount of

1527 service devoted to either. The revenue train mile indicates the trains over the track and the number of times each class of trains enters or passes the stations. I have added the switching miles on all tracks to put the full proportion onto the freight. In Account 376, Station Supplies and Expenses, a difference exists and I have divided the same way as Account 373. On Account 372, dispatching trains, the State's figures are about $2,000 less than mine. I divided on ratio D6, the same as for Station Employees, that being train miles, plus switching. If the accounts Station Employees, Stations Supplies and Expenses and Dispatching Trains was agreed upon there would be little difference in the total of transportation expenses assigned to passenger. Under group "Miscellaneous Operations," added to the classification in 1915, there is no difference between the parties. Before 1915 these items were carried as the Account "Outside Operations."

Under the group "General Expenses" page 4, Pltf.'s Ex. 209, there is no material difference between the parties, Parker's figures in the second column being $350 less and Hillman's $180 less than mine. I excluded from 454 "Law Expenses" the expenses of this litigation. In the column "Total Passenger Operating Expenses"

Parker's figure was $3600 less and Hillman's $3300 less than mine, due to the theory of dividing that account "Overhead" to all the Company's expenses. My ratio is D14, page 8, Pltf.'s Ex. 210, for 1917 31.06% passenger. The total difference between the State's accountants and myself as shown by the summaries for 1917 are: in the column "Operating Expenses Entire Line" none; in column "Operating Expenses Michigan," Parker $8,400 less, Hillman $5200 less. In column "Total Michigan passenger operating expenses." Parker $122,000 less and Hillman $107,000 less than mine.

1528 The principal differences are those shown in the maintenance group and in the three accounts of Transportation Expenses.

Plaintiff's Ex. 209, page 5: There is little difference between the State's accountants and me on the revenue accounts they bring in. It is $306 in the account "Hire of Equipment." They do not bring in as revenue accounts mail, express, sleeping, dining and chair car revenues. The interest included does not include that on the "rate case fund."

Plaintiff's Ex. 210, page 13: This shows division of passenger expenses to intrastate and interstate services, though some percentages are omitted.

Accounts "Outside Agencies" and "Advertising" under "Traffic Expenses" were assigned by stipulation, and the parties agreed. "Station Employees" and "Station Supplies and Expenses" were assigned by me 88.70% to intrastate on the relation of the number of passengers carried interstate and intrastate, regardless of the distances traveled. The number of intrastate tickets sold at these stations is far in excess of the proportion assigned in this to intrastate by me. So far as wages and expenses of station employees and the station supplies and expenses are concerned, it does not make any difference the length of journey the passenger has taken or is about to take when he uses those stations. I have divided on the relation of the passengers traveling, rather than on the miles traveled. The property in the stations was divided on the passenger miles, or 70.67% intrastate as against 88.70% used for station employees. All expense of Soo Bridge operation is assigned to interstate.

Accounts "Operating Sleeping Cars" and "Sleeping Car Repairs and Depreciation" were porportioned on the miles of passengers traveling in D. S. S. & A. sleepers, as shown on page 14, plaintiff's Ex. 205, 33.28% to intrastate. The remaining passenger expenses were divided on the basis of the passengers one mile in the entire intrastate service, or 70.67% intrastate, shown for 1917 on page 8, plaintiff's Ex. 205.

1529 Plaintiff's Ex. 209, page 5: In column "Intrastate" totaling $733,049, my revenue figures are the same as those of the State accountants, except Mail, Express, Sleeping, Dining and Chair Car revenues, which they do not bring in, and the Hire of Equipment, where I have assigned $1,945 and Parker $1,731 to intrastate. In the item "Rents Paid for Hire of Equipment" I assigned to intrastate $1,165; Parker assigned $294; he excludes rental paid for sleepers, which I include.

The method of ascertaining the taxes paid to Michigan for each year is shown on page 12, plaintiff's Ex. 210. In actual accounting,

the taxes are carried ahead as an estimated amount, and charged up each month. Looking back, I would say that taxes would be more than I estimated for 1917, as I used the basis of $187,000, and Michigan taxes have been about $200,000. The taxes are assessed against the railroad as a whole, and were divided between services in the proportions in which the property was divided, first deducting Schedules 34, Ferries, and 36, Soo Depot, which are separate corporations, paying their own taxes. This assigns 31.03% of the taxes to the passenger service. The passenger result was then divided to interstate and intrastate on the passenger miles.

Plaintiff's Ex. 209, page 5, shows the net income, deduction of the estimated loss, and the mail and express loss, and final results.

It was stipulated between the parties that, for the purpose of preparing exhibits and showing operating statistics to be used on this hearing, 10.92% of the total Michigan operating expenses would be considered as due to the mail and express business. Taking this percentage, which was that adopted by the Master, this business in
1917 would show a loss of $6,159. The division between inter and intrastate is purely arbitrary, the revenue and expenses
1530 being divided in proportion to interstate and intrastate passenger revenue and expenses respectively.

1531 DELF.

Direct examination continued:

Pltf.'s Ex. 206 (1914) is the same as Pltf.'s Ex. 209 (1917), except that it applies to operations of 1914; 1914 is under the old I. C. C. classification and 1915-1917 under the new; the groupings of expenses are substantially the same under both classifications. In 1914 we did not have in the books expenses attributable to exclusive freight track maintenance. We were able to separate for freight, structures. The amount directly assignable to freight does not appear on Pltf.'s Ex. 206. The assignment of the passenger proportion of common expenses of maintenance of way was made in substantially the same way in 1914 as in 1917. The column "Operating Expenses" includes expenses of maintenance of exclusive freight tracks. Column "Total Michigan Operating Expenses" is excessive to the extent that it includes a part of the expenses of maintenance of exclusive freight tracks. After making this assignment we deduct the excessive amount from the total obtaining the amount as shown on page 7, Pltf.'s Ex. 209. After having ascertained the cost of maintenance of exclusive freight tracks in 1914, at $47,720 I deducted from the total Michigan passenger expenses 45.09%, of that or $21,517, which was the proportion of expenses assignable to passenger under division D1 in 1914. The proper method would have been to deduct the whole $47,720 from common expense item by item before the division, but the same result is arrived at by subtracting the later. The deduction is in fact excessive by the difference between 42.39% and 45.09%.

The differences between the State's accountants and myself on the figures in Pltf.'s Ex. 206, are:

Page 1, first column, none; second column in totals, Parker shows

$5,401 less and Hillman, $15,094 less than I do. This
1532 is due to my allocating all expenses of maintenance of structures located in the State of Michigan and their having adopted another method. In the last column "Total Michigan Passenger Operating Expenses," Parker's figures are $97,000 and Hillman's $82,600 less than mine due principally to (*a*) the different method of ascertaining the maintenance expense of exclusive freight tracks, and (*b*) to their dividing common expenses on a different ratio. The differences in theory in the accounts of 1914, are substantially the same as in 1917.

On page 2, Pltf.'s Ex. 206, the differences in maintenance of equipment between us are: first column, none; second column, substantial agreement; last column, Parker $1,847 less and Hillman $1,371 less than mine.

The difference is due to the assignment of work equipment-repairs, overhead to the maintenance of way and structures expense. On traffic expenses we correspond *col*sely. Under transportation expenses page 3, Pltf.'s Ex. 206, the differences occur in substantially the same accounts as in 1917 and are: first column none; second column, Parker $300 less and Hillman $3 less than mine; last column "Total Michigan Operating Expenses," Parker $23,600 less and Hillman $22,900 less than mine, the difference being largely due to assignment of accounts 63, Station Employees, and 68, Dispatching trains, also 66, Station Supplies and Expenses. The differences under "General expenses," page 4, Pltf.'s Ex. 206, are: in first column, none; second column, Parker $296 less and Hillman $487 less than mine; in last column, Parker $5,200 less and Hillman $4,100 less than mine, the differences being due to the making of the assignment of general expenses as overhead to preceding accounts.

1533 In the 1914 passenger revenue, page 5, Pltf.'s Ex. 206, the difference from the State's Accountants are: in total Michigan passenger revenue, none. In other items down to taxes, all in the first column, are the same except operating expenses.

The 1914 method for assigning taxes to passenger are the same as for 1917 based upon the valuation of the property. Passenger operating expenses are divided between intrastate and interstate in 1914 in the same way and with the same ratios as in 1917, and the estimated passenger loss and mail and express results were computed in the same manner. Pltf.'s Ex. 207, page 1, shows accounts for 1915. The method of setting off exclusive freight track maintenance is the same as for 1914. In the maintenance of way and structures group differences between myself and the State's accountants are: first column, none; second column, Parker $211 more and Hillman $259 more than mine; last column, Parker $76,760 less and Hillman $59,800 less than my assignment; the reasons for the differences there are substantially the same as in 1914 and 1917.

Under the maintenance of equipment group the differences are: first column none; second column, "Michigan Operating Expenses," Parker $20 less, and Hillman $107 more than mine; last column, Parker $1510 less and Hillman $970 less. Reasons the same as for 1917. Traffic expenses, no difference. Transportation expenses, first column, none; second column, Parker $30 more, Hillman

$1,070 more, last column Parker $23,000 less, and Hillman $22,800 less. The differences are due to the same reasons as in 1917. Miscellaneous expenses show no difference. General expenses, first column, no difference; second column, Parker $830 less and Hillman $710 less than I. Last column Parker, $4,880 less and Hillman $3,680 less. Due to the same causes as in 1917 and 1914.

1534 The differences in the summary for 1915 are: first column, none, second column, Parker $615 less, Hillman $728 more; last column, Parker $106,163 less and Hillman $87,305 less than mine. In the summary Parker's totals were $106,163 less and Hillman's $87,305 less than mine.

On page 5, of Pltf.'s Ex. 207, the differences in first column down to taxes, are: in "rents received for hire of epuipment" Parker $237 more, in "interest" $110 more than mine. On "Rents Received for Joint Facilities," Parker assigns part of the amount to the Mineral Range operations under joint facilities; excluding the Mineral Range the difference is $1,478; on "Rents Paid for Hire of Equipment," Parker assigns no portion of the rent paid for sleepers and the difference is $1,286. The operating expense item and the taxes are different. I apportioned taxes the same as for 1917. In the column headed "Intrastate" Parker assigns no mail, express, sleeping, dining or chair car revenues, to intrastate and the "Rents Received for Hire of Equipment, Joint Facilities" and "Interest" differ owing to the total Michigan differing. The estimated loss for 1915 and the mail and express division was arrived at for 1915 as for other years.

Pltf.'s Ex. 208, operations of 1916: in maintenance of way and structures group, the maintenance expenses of exclusive tracks was arrived at in the same manner as for 1914 and 1915. In that group the differences between me and the State's Accountants are: first column, none; second column Parker $3,340 less, Hillman, $1,644 less due to the same causes as for 1915. In the last column the differences in totals are: Parker $76,900 less and Hillman $53,900 less, in general due to the same reasons as for 1917.

In maintenance of equipment group the differences are: first column, none, second column, Parker $200 less; Hillman $210

1535 less; the last column Parker $1,800 less, Hillman $1,380 less due to same causes as in other years. In traffic expenses there is no difference.

Under transportation expenses the differences are: first column none, second column, Parker $3,200 less, Hillman $2,580 less than I, being substantially the same differences as in 1917. In the last column, Parker's figures are $21,164 less and Hillman's $20,655 less than mine.

Under miscellaneous operations our figures agree throughout. Under general expenses, the differences are: first column, none, second column, Parker $170 less and Hillman $100 less.

Column "Total Michigan Passenger," Parker $3,933 less and Hillman $2,655 less than mine.

In the summary, second column, Parker $6,838 less, Hillman $5,530 less.

Total Michigan passenger, Parker's figures $103,877 less and Hallman $78,675 less.

Page 5, Pltf.'s Ex. 208 was prepared in the same way and shows the same things as the other similar exhibits.

Pltf.'s Exs. 206, 207, 208, and 209, were prepared from our books of accounts and operating statistics and the calculations are properly made. (The exhibits were offered in evidence.)

In November 1916, the basis on mail pay was changed, reducing our mail revenue from $72,000 to $42,000 per annum. I believe from my study of the question that there will be a loss as estimated if Act 276 is put into effect. In 1914 the increase in Michigan passenger revenues was governed to a large extent by the copper country strike from July 1913 to February 1914. Upon closing the copper mines many miners got out of the country and went
1536 to other points on the South Shore, strike breakers and state troops were taken in and there was a large traffic back and forth during the strike. In addition they had a prosperous year in all lines of business.

The total operating revenue of the line for three months ending Sept. 30, 1917, as compared with the same period in 1916, shows an increase in revenue of $166,700, and an increase in expenses of $228,400. I have not the Michigan figures nor have I divided between passenger and freight. I have taken from the reports of the Michigan Railroad Commission various operating statistics for the fiscal years, ended June 30, as follows:

Michigan Passengers Carried One Mile per Mile of Road.

R. R.	1911.	1912.	1913.	1914.	1915.
Mich. Cen.	197,732	203,968	214,246	226,881	222,795
G. R. & I.	159,075	161,987	169,722	175,639	164,541
D. S. S. & A.	74,721	72,238	77,327	88,524	67,493

Passenger Train Revenue per Mile of Road.

Mich. Cen.	4,751	4,842	5,344	5,662	5,626
G. R. & I.	3,370	3,461	3,716	3,896	3,729
D. S. S. & A.	2,199	2,068	2,194	2,458	2,027

Tons of Freight Carried per Mile of Road.

Mich. Cen.	1,402,869	1,388,946	1,639,858		1,400,755
G. R. & I.	738,139	698,869	767,457		676,739
D. S. S. & A.	401,204	399,888	426,915		367,355

Freight Revenue per Mile of Road.

Mich. Cen.	8,862	9,338	12,653		10,019
G. R. & I.	4,854	4,899	5,345		4,931
D. S. S. & A.	3,587	3,639	3,894		3,144

1537 *Statement of Coal Cost in Sept.*, 1917, *as Compared with Sept.*, 1918.

Year.	Tons.	Cost per ton.	Total cost.
1917	3300	$5.65	$18,648
1916	3129	3.05	9,543

I understand the 1917 coal is not as good as last year. Our reported prices for ties consists of the amounts we paid contractors to get out the ties plus the cost of inspection only.

Cross-examination.

By Mr. Wykes:

In order to compare our statistics with those of the other roads enumerated, the proper elements to determine the value of the comparison would be: comparative cost of construction per mile and comparative cost of maintenance and operation. I do not think it would be necessary to know whether these particular companies are carrying at the two cent rate with a considerable profit or not. I did not investigate the extent of their profit. The tabulation is to indicate that other companies carrying passengers at two cents a mile are in a better condition to do so than the South Shore, as they have a greater traffic. The indication is that if the plaintiff makes a profit out of 67,000 passengers per mile the Michigan Central makes an excessive profit out of 222,000 passengers per mile.

As bearing on working capital, plaintiff has one fund from which it draws current funds for use in carrying on the railroad business; the money is in the bank subject to the check of the treasurer and would bear the burden of paying interest, etc.

Schedule 19 on Pltf.'s Ex. 201, is shops, located in Michigan but used to repair the equipment worn out on the entire line regardless of place. While freight equipment may be repaired at Superior we have no shops to balance the shops in Michigan. I have assigned no part of the property in shops or of the expenses of their maintenance or taxes outside of Michigan.

1538 The general practice in the appraisal has been to assign to Michigan, property there located, though engaged in serving the business of the entire line; the same is true of the expenses of maintenance of the property.

Schedule 42, Stores and Supplies, were assigned on a road mile basis made up of mileage of main line, exclusive — freight track and traffic spurs on the theory that they are necessary for use in the maintenance of the road. Due to the fact that 66 miles of the traffic spurs fall in Michigan and a less proportion to main line in Wisconsin, and that the ratio of maintenance of exclusive freight track to main line is about as one to three, there possibly should be an adjustment for that item of mileage. The same thing may be true to a greater or less degree of miscellaneous equipment, and which

is assigned on the basis of road mileage and used in the repair and maintenance of the line. It is not necessarily true of working capital as that represents all the traffic moved off the spur tracks.

On Pltf.'s Ex. 209, page 1, the second column headed "Operating expenses, Michigan" differs from Parker's and Hillman's in part because of my making no assignment of items in Michigan used in the common service of the line to business outside the state, together with differences arising out of those in applying overheads. I do not know what per cent my operating expenses shown in this column should be reduced if such assignment were made. I think the Master made this assignment on the road mile basis. After finding the Michigan expenses, my next step was to allocate as far as I could to services. While my tabulation shows what was allocated and assigned to passenger it does not show what was allocated and assigned to freight, though it might be computed from the exhibit. We did set off a certain amount to exclusive tracks in 1913—we made a guess at it assuming the cost of maintaining a mile of main
1539 line was three times the cost of maintaining a mile of side track; that the cost of maintaining a mile of exclusive mine freight track was $375, the cost of maintaining a mile of industrial spur freight track was $300. We equated the mileage of the side tracks by dividing by three, added the resultant to the total main line mileage; then we took the total maintenance cost and deducted from that the cost of maintaining the industrial tracks and the mine tracks to get at the cost of maintaining the main line and the sidings. We divided that result by the equated mileage of the main line and sidings to get at the cost per mile of maintaining the main line and sidings; then we applied that cost to the equated side tracks freight and passenger, and added to that the cost of maintaining the exclusive mine tracks and industrial tracks and took that as the total cost of maintaining the exclusive freight tracks.

We based a three to one equation on the testimony of Messrs. Lytle, Young and other witnesses. It resulted in assigning about 12.5% of the total maintenance cost to exclusive freight. Under our present method we assign to exclusive freight 1916, 8.63%, 1915, 7.83%, 1914, 8.42%, taking the total Michigan cost and comparing with the total freight cost.

For 1917 the separation of exclusive freight track expenses was based upon investigations under the I. C. C. order of 1915. We got the system in operation for the year 1916 and used the blue print, Pltf.'s Ex. 219. This method did not result in as much expense being assigned to exclusive freight track maintenance as testified to by Lytle, Young and others, though it does not necessarily disprove their claims. The effect of the previous method was to attribute to the exclusive freight tracks a portion of the expense of structures not located on those tracks. There is nothing on the blue print (Ex. 219) to indicate that any part of the expense of
1540 the maintenance of the switch as it intersects the main line is to go to or with the exclusive property, which makes it necessary. I do not think the blue print (Pltf.'s Ex. 219) in the hands of section-men might indicate that the switch might go with the

main line. I think the instructions in another book take care of that. I should say when he put- in a switch leading off to a freight spur his instructions are to report material used in the freight spur as freight, and it was intended that he should put it in the freight column. Our section-men are about the average of intelligence for that class of labor. I think they endeavor to do the best they can. In the instructions (Defts.' Exs. 335-336) on page 3, the heading "Used for Repairs" is divided into three columns "Exclusive Freight Tracks," "Exclusive Passenger Tracks" and "Common Tracks." The instructions are plain. The front of the red cover, reads under the heading "Used for Repairs"; "Enter opposite each article the quantity of material actually used for repairs during the month on account of ballast, ties, etc. Particular care should be taken to enter in the proper column materials used on exclusive freight, exclusive passenger, or common track.' The section men must know which the exclusive track is and what the instructions are, and he would then be able to make proper distribution. The blue print, Pltf.'s Ex. 219, indicates which tracks are designated as freight. The section man would know what freight tracks, including the frog joining it to the main line, was freight track. None of our men were told the point in main line to which the exclusive freight track should go. I do not think blue print, Pltf.'s Ex. 219, misleading, the section man would know where the track began and ended. There may be difficulty at times in telling what is exclusive and what is common track.

The switch runs into the common property where it joins
1541 the main line and, as to whether instructions should have been more detailed, I think too voluminous instructions do not get as good results as when you make them short and leave it to the common sense of the man doing track work all the time. There is no way of testing out the reports of the men in labor and material used in maintenance of exclusive tracks, except by doing the work over again, every other means is a guess. As to whether divisions of expenses between exclusive freight and common, and between freight and passenger are arbitrary, and in the nature of guesses, I would say arbitrary divisions must necessarily be matters of opinion to large extent. If the man has had experience in the work and of the operations in which he is making estimates they are not all together guesses. Mr. Lytle's estimate of a 3 to 1 equation for certain kinds of track, $300 a mile for another kind, and $375 for another, might have been all right, but the error would occur in our application of it.

In speaking of the reason for the differences in the amounts assigned to Michigan for transportation expenses by myself and by the State's accountants, I did not separate the trains crossing the State line from Thomaston west and divide on the mileage of trains. Each engineer's time is kept separate and the engineman who ran only in Michigan his entire time was assigned to Michigan. The enginemen who run in two states their wages are assigned between the states on the mileage of the runs in each State. The run of the enginemen into Wisconsin began at Thomaston usually. The enginemen are required to report for duty a certain length of time before they take their trains. If there is waiting time at the beginning or end of the

run, my method would not necessarily charge Michigan with too much of the expense because the same thing occurs at the other end of the line. The waiting time would be divided between the
1542 crews on the miles run and Michigan would get its entire end for the short haul, Thomaston to the State line; Wisconsin would get its end as against a much longer haul.

I divide dispatching trains under transportation expenses, between passenger and freight on formula D6, train mileage plus all switching. In making my divisions I have proceeded upon the theory that the time of the dispatcher's office and the expense of dispatching trains relates solely to trains and switching. They do send general messages for the operation of the road. I also divide the common portion of station employees upon ratio D6, train miles plus switching. At six stations—Sault St. Marie, St. Ignace, Marquette, Negaunee, Ishpeming, Houghton and the Marquette Ore Dock Agency—we were able to allocate a considerable amount of the station employee's expense. The difference between myself and Parker and Hillman is that they divide the common portion of that item on the basis of the allocated amounts. The common portion of the item is made up almost entirely of stations other than those I have mentioned. They assign the common stations other than those mentioned, on the relation of the allocations at stations which have no connection with the other stations though they are all embraced in the same account.

For each year I have used the modified revenue train mile division for the larger part of the common expenses; that accounts for a large part of the difference between myself and Parker and Hillman. Originally—in the earlier years—we divided the items which I now divide on the modified revenue train mile ratio upon the straight train mile ratio. We had made that assignment for use for statistical purposes from 1890.

We took that ratio, that we had been using for years, and applied it. I do not know whether there is any other ratio that would give a larger proportion of expense to passenger. This was the
1543 ratio used by the principal roads of the United States for that same division; it was used for a long time for comparative statistical purposes; we had used it for such useful purposes as we thought proper—for comparative statistical purposes. The present modification of the revenue train mile basis is to take into it a certain proportion of the switching and stational mileage. It assigns to the passenger service a greater proportion of expense than the straight revenue train mile ratio plus switching or my ratio D6. D6 made up of the revenue train mile plus switching takes in switching on exclusive tracks and we are only trying to divide expenses on common tracks. Locomotives running light are not included in the train mileage, though they would have the same protection from the dispatcher's office as a train and would perform a complete operation over the portion of the track they used. A large proportion of the engines running light would be in freight service. I made no modification to take into account the load behind the locomotive or the greater number of cars in one service over the other. In passenger trains the average number of cars in passenger trains is 4.7, and in

freight trains 20 to 22.5 (1916-1917). I have made no adjustment in my ratio, between the time I first prepared it and the present, to take into account the increasing length of freight trains during the period intervening between its first preparation and the present. There is no modification to take account of the different character of equipment in the two services—the less perfection of equipment in freight and the greater perfection in passenger service. The ratio is not modified at all; the actual mileage is taken and used, except for the use of the portion of switching on the common tracks.

In setting off exclusive track switching we required the reports from train men intended to set forth the amount of stational work or switching on common tracks and on exclusive tracks. We
1544 required the freight conductors to show the total amount of switching at various stations; the amount on exclusive track; the amount on common track and the location of the train during the switching. The reports show that the train was left on the common track the major portion of the time. I have not computed the percentage to know that it was 97% of the time. In computing the modified revenue train mile ratio I did not in any way give effect to the use of the common tracks by the trains standing on it during 97% of the time, when the rest of the train was engaged in stational work. In the two columns relating to the time of switching on common track and on exclusive track, we instructed the conductors to report the time engaged in switching, without any reference to standing time.

We asked no separation between standing and moving time, I assume they reported what we asked—the time engaged in switching. No division was made of the standing time and moving time in the switching operations. Not having the standing time we could make no such division. While they were unloading freight at a station I do not think the standing time would be included in switching time, though I do not know personally. The reports will show whether the switching time on common and exclusive tracks equals the total time spent at the station. Originally plaintiff's proofs showed about 39% on the average, of the time of freight trains as engaged in stational work. That was largely estimated, being testified to by each train conductor for his train and was then mathematically computed from the testimony. To get the present modified ratio that 39% has now in effect been reduced by taking out of the stational time the operations on exclusive tracks. The time engaged in switch-
1545 ing on common tracks is then computed, at six miles per hour and is added to the train mileage which is made at an average of 16 miles an hour. In 1915 the passenger proportion of the revenue train mileage is 53.9%, and of my modified revenue train mile ratio is 48.65%, a difference of 5.3% of the total train miles. By the modifications the passenger proportion of the expenses have been decreased about 5.3% under what they would be by the straight revenue train mile ratio. With regard to the revenue train mile ratio for the division of common expenses I do not know how close to actual results it gets. If we knew actual conditions we would not be using the modified revenue train mile or any other train mile ratio. No-

body knows the margin of error in the ratio used. I make no elimination of the cost of operation over the Mineral Range but we include the cost of operation of our through trains to Calumet in our passenger operations.

We operate a number of through passenger trains that are delivered to us by the Chicago & Northwestern at Negaunee, and the Chicago, Milwaukee & St. Paul at Champion, through to Calumet; we put our crews on them at Negaunee and Champion and operate them through to Calumet. The revenue accruing therefrom comes to the D. S. S. & A; those trains become our trains for the purposes of operation, and as they run through to Calumet over fourteen miles of the Mineral Range Railroad, and are operated over that road by the D. S. S. & A. and D. S. S. & A. crews, we include in our passenger operations the cost of that operation over the Mineral Range road. We bear the cost of the train men, engine men, and the fuel consumed by the locomotives because the D. S. S. & A. receives the revenue from those trains while on its tracks, and in addition a bonus from the Chicago, Milwaukee & St. Paul, and the Chicago & Northwestern of $14,000 a year
1546 for running those trains; for taking the other companies' trains and running them over our track they pay us $14,000 a year in addition to giving us all the revenue from the trains.

The Mineral Range receives the passenger train revenue earned on that line. They charge us nothing for the trackage over their line, but we guarantee that their revenue shall equal forty cents a train mile, if it does not we make it up. As a fact, it does; therefore there is no expense to the D. S. S. & A. for operating this train over the Mineral Range tracks, except whatever cost may be incurred through its employees operating the train and the coal that is consumed. The bonus is credited to our passenger revenue, or it has that effect, part of it; 75 per cent of it is credited to revenue and 25 per cent to maintenance under the Interstate Commerce Commission rulings. The effect is to credit the total amount, $14,000, to our passenger operations.

It is in consideration of our running those trains through to Calumet that the arrangement is made; we have not attempted to show what portion of that cost should be attributed to the Mineral Range. Our operating cost is increased by the expense of our train crews, fuel and supplies used in running the trains. We pay all the train men; the Mineral Range collects its own fares and receives the entire revenue except the rental. The Mineral Range maintains its own line and the only expense we are put to is the operation of the train. We would pay our conductors and trainmen the same wages whether we ran through to Calumet or Houghton; there was no overtime. The engines are ours; the equipment is that of the C. & N. W. and C. M. & St. P., on four of the trains; there are eight trains, four of them are ours. There are four trains up, Nestoria to Calumet each day. There are two big interstate trains from Calumet
1547 through Nestoria, about two hours apart, and return each day. These are made up of sleepers, diners and baggage cars, and are the heaviest trains on our line, running between Calumet and Chicago. The heavy locomotives I spoke of yesterday are in part,

used in drawing those interstate trains. They do both an inter and intra state business. A Marquette sleeper is added to the C. & N. W. train to Chicago at Negaunee. For our own four trains over the Mineral Range we neither get or give a bonus or rent. The Mineral Range operates no trains of its own from Houghton to Calumet. The practice to permit the Mineral Range to receive all the fares is true of our trains as well as those of the C. & N. W. and C. M. & St. P. The plaintiff owns a controlling interest in the stock of the Mineral Range, its books and accounts are kept in plaintiff's office and plaintiff's officers are its officers.

The Mackinaw Transportation Co. property is included in the inventory. The net cost of operating the Mackinaw Trans. Co. is divided between the three operating companies; our proportion of the net loss is charged to freight, because the freight business furnishes none of the revenue. There is a revenue to the M. T. Co. from passenger service. I have given our passenger income no credit for any amount due to net earnings of the M. T. Co. in the passenger business. They charge for carrying passengers across the Straits. Its only income is for passengers, baggage, mail and express and there is no revenue for freight transported on through rates. The passenger earnings are used to reduce the loss or net cost of operation in both passenger and freight by the accountant of the M. T. Co. He reports the proportion of net loss that we are called upon to pay. Plaintiff's interest in the M. T. Co. is a stock ownership. Our trains
run onto the ferry and are carried to Mackinaw City with
1548 passengers in it, and vice versa. The M. T. Co. as a whole
operates without profit. There is no direct charge to the owning companies on account of freight transportation. The net expenses of operation are ascertained by a deduction of revenues from passengers and the small amount of local freight, mail and express and then divided among the three owning companies on the freight over the Straits.

Our passenger cars are run across there for the convenience and benefit of all concerned. We can transfer passengers to the other two roads in our cars; it would be more difficult to transport the cars of the Michigan Central and G. R. & I. over to our line; i. e. a transfer can be made better by transferring cars of the one line to the two, rather than by reversing the situation. We pay nothing for the carriage of our cars across the Straits but they are used for the convenience of the passengers travelling between the three roads making one transfer of passengers do for two. The division of operating expenses is based on freight without taking into consideration the carriage of passenger cars at all, and the passengers are taken into consideration only by way of credit or deduction from the general operating expenses of the ferries. The South Shore pays between 30% and 40% of the expenses of the Mackinaw Trans. Co. I believe prior to 1913 the loss was in part assigned to passenger business.

In separating the mail and express portion of the expenses, my method was to apply 10.78% to the total expense assigned to passenger as representing the cost of that business and as agreed to by stipulation. This percentage was fixed by Mr. Thompson who divided

the accounts for 1912 and this percentage was taken from his results for 1912 and Mr. Parker's for 1913. I made no modification for the heavier equipment which later came into use, the effect of
1549 which was reserved in the stipulation. I make no separation of sleeper and diner business or expenses, except to set off to sleeper and diner business the directly charged costs; that separation is required by the I. C. C. classification. There is a margin of profit in the sleepers, and in the diners a loss; that takes into account no cost of maintenance, wages of trainmen, coal used, track maintenance or things of that character, but simply the costs incident to the operation and management of the sleeping and dining cars themselves. My charges to sleeper and diner business include no part of the haulage cost or anything of that character and no use of property except the cars themselves and the supplies used in them and directly charged to that service.

In the property divisions there was no deduction from property values on account of the portion of the train used in mail and express service. The whole property was assigned to the passenger business. Pltf.'s Exs. 204, p. 15 and 205, (pp. 14-15) show the mileages made in sleepers for 1916 and 1917 respectively. In 1917 the number of intrastate passenger miles was 23,630,061, while the number of intrastate passenger miles in sleepers was 2,147,589, — %. The intrastate passenger miles given do not include those on the Mineral Range and it was not the intention that the sleeper figure should; I think it does not. In 1917 the interstate passenger miles in Michigan were 9,806,277 and in sleepers 3,539,818, approximately 36%. It was not our intention to include the mileage on the Mineral Range in either. It may have been done but I think not. I am not positive. In 1917 the total passenger miles in Michigan was 33,436,338 and the total in sleepers, 5,687,407. Approximately 17%.

The trend of the total intrastate passenger miles in the past few years has been upward and in interstate downward; the per-
1550 centage of intrastate to total being 1914, 64.69%; 1915, 70.29%, 1916, 70.80%, 1917, 70.67%. The greater part of the common passenger expenses for 1917 were divided 70+% to intrastate and the remainder to interstate. What we term sleeper and diner expenses, I mean the directly charged expenses, are not buried in the operating expenses they are set out. There has been set off by me to sleeper and diner no expense for train haulage, coal, time of train men, etc., and if there is such an item chargeable to sleeper and diner it is still included in our passenger expenses, and if there is now divided on the ratio of about 70% intrastate and 30% interstate, notwithstanding the figures given which represent the ratio of use of sleepers and diners by interstate and intrastate passengers—those are the figures of use by those passengers.

1551 DELF.

Cross-examination:

For 1917 about 90% of the plaintiff's passenger expenses were divided between inter and intrastate passenger business on the passenger mile basis; the ratio included all passengers and specifically those travelling on cash fares. Accounts 373, Station Employees and 376 Station Supplies and Expenses, were assigned on the ratio of intrastate passengers to the total number of passengers travelling in Michigan, including those travelling on cash fares. I have made no deduction for those travelling on cash fares made no investigation to find the proportions interstate and intrastate, and can give no approximation. The large number of soldiers carried during 1914 were charged one cent per mile, which reduced the average rate per mile. The valuation expenses for the Federal appraisal appear under general expenses. This expense will be temporary while the records and maps produced will be permanent records. We charge no part of it to capital account. I cannot give you the operating ratio for the Western Division and have made no computations or figures looking towards separating that division. I could not say whether operating expenses there would closely approximate those of the portion of the line outside the State. I eliminated as an item of the general law expense, the expenses incident to this case. This excludes no part of the time or salary of myself, Mr. Caderette or Mr. Eldredge, though Caderette's salary for a part of the period was charged to the case. The practice has been that the time of regular employees spent on this case is not charged to it. The only exceptions are Messrs. Caderette and Tracy. The expenses have not been increased by the wages of the clerical force.

1552 Redirect examination:

Plaintiff has not paid interest upon the $15,000,000 of bonds held by the C. P. R. for many years. It has been unable to do so.

If we took into consideration the mileage of light locomotives it would reduce our 1916 M. R. T. M. ratio about .49% from 44.63% passenger to 44.14% passenger, and our 1917 ratio .5% from 42.21% to 41.63%. For 1913 and previously we had no exact figures of the time of road locomotives in switching operations. We had to obtain those figures by approximation. The requirements of the I. C. C. then required that only the switching over an hour should be taken into account. In 1915 that was changed to require the entire switching time. Since June 30, 1914, our statistics show the time of each locomotive spent in switching at stations. To ascertain the ratio of switching miles in 1914 we took the same proportion of the 1914 train miles that the switching miles in 1916 bore to the train miles. We get no revenue from passengers who occupy the cars or cross the Mackinaw Trans. Co. ferry for that portion of the trip and we pay nothing for carrying the cars across. The Mackinaw Trans. Co. pays nothing for having our cars to accom-odate the passengers. The rate

is the same over the ferry whether the passenger is in our car or not. The use of our cars is simply an accom-odation to the travelling public, saving trouble in getting on and off of the cars and boats. Mail and express revenues are not separated by accounts to inter and intrastate. Those revenues were divided in relation of the passenger revenue inter and intra. So far as operating expenses and revenues are concerned we have eliminated the mail and express. Only the directly assignable expenses of sleepers and diners are eliminated from the passenger expenses.

(Exhibit 210 offered in evidence.)

1553 ARTHUR E. DELF recalled.

Direct examination.

By Mr. Tracy:

I made the computations on the first sheet of Pltf.'s Exs. 201*a*-201*e*, *to* assigned the property between passenger and freight and intra and inter state. In general the method used is the same as that in assigning the 1917 property in Pltf.'s Ex. 201, though the statistics used were those of the particular year. The additions shown in these exhibits less retirements do not agree with the figures shown in our reports of additions and betterments to the State and I. C. C., as those reports are not of values but of investments and the net charge in investment is reported. These sheets show retirements from the valuation of 1913 and additions to the values of 1913 and each succeeding year. In the case of the replacement of a bridge in 1914, the exhibit would take the old bridge out at the Master's value and add the cost of the new bridge. In the reported additions and betterments account the addition would be the cost of the new bridge, but the retirement would be the original cost of the structure taken out if known and if not known, an estimated cost of the old bridge new. We would retire from our accounts exactly the amounts charged in for the structure if it appeated there—the original cost if we had it. Our ledger account shows no depreciation and old buildings stand in our property account at the original cost until demolished or replaced. For the very old structures we would not have original cost and in that event we would have to estimate the amount to retire. The former rule, before the classification of 1915, was that the difference between the new structure in value and the old structure replaced, constituted the charge to additions and betterments. Deft.'s

1554 Exs. 335-336 are blank books furnished the section foremen in which to keep a record of the work done and material used on track of various classes. Ex. 335 was for their labor and to make a distribution of it to the different classes of work; Ex. 336 was to keep track of the material and make a similar distribution. They are required to enter each man's time and make the distribution of it to services daily. The time was also distributed as to the character of work performed, whether putting in rails, ties or bridges, laying in track, or putting in other track; it is entered under the

various primary accounts. In addition he designates whether it is on exclusive freight or on exclusive passenger track. I have examined many of these reports and found them uniformly correct as far as could be ascertained. Ex. 336 is a monthly record showing material on hand on the first of the month, the amount received and applied during the month to the different classes of services and under the various primary accounts.

I do not run across the instance referred to by Mr. Hillman in Section 34, but I found cases where the foreman had entered in the first column provided for freight, passenger and common the amount on exclusive freight tracks, and possibly in Sec. 34, he had entered the balance in the next column which are passenger tracks. It should have been entered in the third column "Common tracks." When those accounts came in for distribution an experienced man checked the labor with the material and he can determine whether an error of that kind is made and correct the error. It is evident those corrections were made as the total amount carried forward to final distribution for all sections for exclusive passenger in "Other track material" of the line is only $450 and the error stated by Hillman was $1528.54, and accrued in "Other track material." Including roadway and maintenance, ties, other track material and track laying and surfacing, the exclusive passenger allocations
1555 were but $793 for the year. I have had careful oversight during the year 1917 of the way these reports were received and distribution made. I believe that except for the two errors of under $1,000 to which I called attention in my direct examination, the reports as corrected carefully show the expenses on exclusive track in 1917. The errors spoken of are where the blue print shows two tracks as common which should have been shown as exclusive freight.

Upon investigation I find that the mileage made by passengers on the Mineral Range are not included in Pltf.'s Exs. 204 and 205, relating to travelling in sleeping cars. In my exhibits I have not included the passenger miles or passenger car miles on the Mineral Range. In instances locomotive miles and car miles have been included for special purposes, e. g. separation of mileage of locomotives or cars to states to get the service in states. I have not included the Mineral Range, aside from the locomotive and car miles for a particular purpose, in my computation beyond including the operating expenses, of our trains over the Mineral Range and locomotive and car repairs.

The account "Superintendence" under "Traffic expenses" I divided between inter and intra, not as overhead to the other expenses of the group as Hillman did, but on the inter and intra state passenger miles. I do not think the overhead basis correct as the item "Outside agencies" is but 7.97% intrastate and the outside agencies which are 92%+ interstate are not controlled by our general passenger agent, but by the general passenger agents of the other companies representing us. Therefore outside agencies should not come into the overhead to determine the distribution between interstate and intrastate. The general passenger agent, superintend,

passenger traffic generally, issues tariffs and tickets and obtains reports of traffic. Under Traffic account, 351, the classification reads:

1556

"This shall include: Pay of officers directly in charge of or engaged in supervising the procurement of traffic, and the preparation and distribution of tariffs, division sheets, and classifications."

The general passenger agent also arranges for local excursions and special trains which are for the greater part intra-state. Pltf.'s Ex. 220 is a statement of plaintiff for Michigan showing its total operations and those of the freight and passenger business, together with the net income derived therefrom before and after deducting the estimated passenger loss and the rate of return of each class of plaintiff's business, based on the valuation of 1917, Pltf.'s Ex. 201 and on the Master's valuation of 1913. The exhibit shows the Master's valuation for each of the four years and the last page shows an average of the four years. This is correctly made up by me. (Pltf.'s Ex. 220 offered in evidence.) Pltf.'s Ex. 221 is a computation of the rate of return on property values shown in Pltf.'s Exs. 201, 201*a*-201*c*, and shows the intrastate value for each year, 1914, 1915, 1916-1917, the net intrastate passenger income and rate of return both before and after deducting the estimated loss. This exhibit is made from figures already in the record, the net returns being taken from plaintiff's Exs. 206, 207, 208 and 209.

Cross-examination.

By Mr. Wykes:

Pltf.'s Exs. 220, and 221, show the entire intrastate property and the return on the passenger property. I cannot combine to give you the return on the total intrastate property. We have made no figures separating freight property or revenue. It is impossible for the court from my figures to ascertain that.

1557

Pltf.'s Ex. 220 relates to each year 1914-1917 and to the Michigan passenger property as a whole. In each instances results were obtained without deduction for expenses on the Mineral Range. In each instance there is no deduction of facilities or expenses by reason of property located in Michigan which serves the entire line, such as shops and water stations. So far as those things should go out of Michigan, if they should go out, the incident expenses are included in the figures entering into my final results.

My results are entirely predicated, so far as common expenses, not divided on some near basis, are concerned, upon the division of common expenses between passenger and freight upon the revenue train miles in Pltf.'s Exs. 206-209. I have made no deduction for sleeper and diner expenses except to carry as a separate item the direct costs incident to their operation. I did not even take out the direct costs.

In Pltf.'s Ex. 221, I show a slight return for 1914 and 1916 and no net return for 1915 and 1917 in intrastate passenger operations, obtained after the deduction of a loss equal to the difference between the rate now being charged and the statutory rate on the business applying to the particular year. That is a straight mathematical

computation applying the two cent rate to the passenger miles. The computation is based on actual travel in each of the years with no allowance whatever for increases in traffic due to stimulation of business. The expenses of plaintiff's trains over the Mineral Range are included in plaintiff's operations with nothing set off to the Mineral Range. Our passenger miles included those of the Mineral Range previous to October, 1912, back to 1910. The item Traffic is one of the group accounts and includes outside agencies, which was allocated by all parties on the basis of an investigation by Mr.
1558 Heiss, on which he separated between inter and intra services. We had made the allocation between services ourselves. The official classification provides that outside agencies shall include:

"This account shall include the pay, and the office, travelling, and other expenses of general, commercial, city, and district agents and other- soliciting traffic, the employees of their offices, and traveling agents and solicitors located on or off the line of the carrier's road. City ticket and freight offices, shall be treated as outside agencies; the pay and expenses of the employees therein and the expenses of such offices shall be charged to this account. Commissions for services pertaining to either freight or passenger business, except commissions paid in lieu of salaries to carrier's agents located upon the carrier's own line shall be included in this account."

The supervision of operations under the account "Outside agencies" is directed by the general passenger agent. We have no superintendent of traffic. The expense- of the general passenger agent are in part found under the item 351, Superintendence. A portion of the item, "Outside Operations," comes in through commissions paid to agents of other lines who have sold tickets over our line. On those agencies the entire supervision was given by the officer of some other company. If the G. R. & I. agent routed passengers over our line and we paid him for it, he was superintended in that operation by G. R. & I. officials. If one of our agents routed passengers over the G. R. & I. there might be a reciprocal arrangement by which our agent would get a percentage on the ticket by personal arrangement with the G. R. & I.

"Q. If the G. R. & I. is extending supervision to that service that they know nothing about, it is done without the consent of the
1559 general officers, is it not?

A. That I don't know; I don't know what the arrangement is; I have nothing to do with that."

We get varied rates on excursions on our line there being no fixed rates. There may be a general tariff filed with the I. C. C. or State Commission for week end excursions. The rates for that run considerably below our usual rate. That covers round trip transportation. I have not those rates in mind, I could not tell them. I have never made any computation to find out how many passengers per year we get on that sort of business. I have never made any computation to see whether it is profitable or not. We run those excursions every week end. In addition there are many special excursions between points on our line and to Detroit and other connections. There is a considerable volume of the excursion

business. I do not know whether we would get the business or not if we did not make the special rate. It is made to stimulate the business in cases where there are special fairs like the county fair at Marquette, to get people to go to the County fair. We make special rates in combination with other railroads that go as far as Detroit. We go to Detroit twice a year. I do not think we make any special excursion rates beyond Cleveland. I know of none to eastern points except possibly once a year at St. Anne de Beau Pre, north of Quebec. That business is carried on to get the business in volume. In many instances the special rates given do stimulate business and we necessarily get more business on account of it. When there is a special occasion that the people want to go to and we run a special train and give a lower rate, it is an inducement and brings the people. A low rate is an inducement to the people to take a journey which they would not otherwise take in bulk.

1560 The million miles of state troops carried in 1914 at 1¢ per mile fixed by statute entered into the accounts in the amount received. The effect is to make the estimated loss as we have figured it, too low. There would be another cent a mile on that travel. Defts.' Exs. 335-336 were used by me to find and attribute $56,123 to the expense of maintenance of exclusive freight tracks in 1917 and $1,045 to exclusive passenger and a certain amount to common maintenance. I have not that amount. The results are taken from all sources, whether they come through section books or from other sources. The amounts reported in Defts.' Exs. 335-336 would not aggregate the amounts spent in maintenance of track separated to the various services. There is a way of checking the books for the particular items we have referred to.

"Q. In the book entitled "Distribution of Track Labor," I am unable to find anything in it which relates to any division between freight, passenger, and common, or "neither," which is the head of the fourth column, which relates to any distribution between services.

A. Just what do you mean by "Services," the primary accounts.

Q. Between freight, passenger, common and neither, between those services, for the purpose of that question. Those columns you tell the man not to fill out, but you tell him *him* at the bottom of the sheet in the middle of a book of perhaps ten pages "In front of the time entered daily for work done on exclusive freight or passenger tracks, write the letter 'F' for freight, or 'P' for passenger." That is the sum total of the directions contained in that book, is it not, Mr. Delf?

A. The instructions are in the front.

1561 Q. Find in the instructions then where you direct him in any detail to divide between services. I have not been able to find it.

A. "Distribution of labor (Pages 2 and 3) Enter hours worked on each kind of work under proper heading. The total number of hours for day for all employees will be same as total shown on time roll."

That is the second paragraph on the first page, on the cover. Distribution of labor, pages 2 and 3.

Q. Well, now, that relates, does it not, to the kind of work which is set down on the side of the sheet, and not to your columns of distribution at all.

A. As a matter of fact it relates to the whole thing.

Q. It relates to anything that the men might be bright enough to find in that book, doesn't it?

A. And they do; they designate freight or passenger as is intended by those instructions.

Q. And the check that you say was made of this was a check made to discover errors apparent on the face of it?

A. Yes, to check the labor and material.

Q. If a man had been guilty of a mistake in judgment, or had not understood the instructions, and had put his figures in the wrong column here on the right of the page, you had nothing in your office that would permit you to correct that error, had you?

A. Yes, the fact that distribution of labor showed that there was no labor in the passenger item, and there was material under the passenger, would indicate that there had been an error in the distribution of that material.

1562 Q. When a man requisitions his material, he requisitions it for the passenger service, freight of common?

A. He requisitions it for general service.

Q. If he requisitioned it for general service and it were assigned out to general service, what record have you in your office to permit you to determine whether he had correctly entered it under these items into which general service would be divided?

A. There are only three services, freight, passenger and common.

Q. And "neither," whatever that is.

A. If he didn't use it for either service it would be still on hand, as shown in the red book.

Q. What I want to know is, when it was assigned to general service, how could you check to see whether he was correct in reporting its use for a particular service?

A. If you will refer to the distribution book, and the instructions in the distribution book, they are clear as to how the is to report the material as to the freight, passenger or common service in the use of material.

Q. In other words, you say they are clear because it says that: "Particular care should be taken to enter in the proper columns material used on exclusive freight, exclusive passenger, or common tracks."

A. Yes.

Q. But you furnished the men nothing else for the purpose of telling him what is a freight, or what is a passenger, or what is a common track, but you did furnish him with this blue print book that has gone in as an exhibit, that I insisted was misleading?

1563 A. We furnish him the blue print book, and if you will refer to the white book, at the bottom of page 4, where he makes the distribution of time, you will see in bold type: "In front of the time entered daily for work done on exclusive freight or passenger tracks, write the letter 'F' for Freight, or 'P' for passenger.

If you will refer to the white book, Mr. Wykes, you will find——

Q. You mean that notation at the bottom?

A. Yes.

Q. I read that, I called your attention to it a few minutes ago, that F and P?

A. Yes.

Q. In other words, instructing your man not to put these in appropriate columns after you told him to in the other book, but to put the words "and P before it?

A. That is so that this further distribution can be made in the general office.

Q. You say you made a check in the office of these books, do you know how many errors they discovered?

A. No, I do not.

Q. The checking made in your office or in the engineer's office?

A. It is in the engineer's office under our supervision.

Q. And if that 34 was found and corrected as you think it was, it was not called to your attention?

A. No, it was not. It must have been corrected as it was not carried into the final distribution.

Q. Or, Mr. Delf, there must have been an offsetting error
1564–5 somewhere else that in effect corrected it?

A. I don't see how there could be an offsetting error to correct an excessive assignment to the exclusive passenger. It would necessitate a credit to do that."

The retirements and additions in Pltf.'s Exs. 201*a*, *b* and *c*, are based partly on cost but do not follow the costs or our books or reports completely. In retirements we have cut out the Master's value at his unit price, thus excluding the item that he included. The charges in our books under "Road" or "Additions and Betterments" are charges to investment and not to value, would represent the charge in our property accounts and would not be the figures in these exhibits. In the retirement of an old bridge, the charge to operating expenses would be the same as the credit to the old structure, which is either the ledger value or the estimated value less salvage.

Redirect examination.

If there is depreciation reserve in our books a portion of the retirement would be charged to that account and the balance to operating expenses. We carry no depreciation reserve except on equipment and ore docks.

1566 R. C. YOUNG, recalled before the Court Nov. —, 1917, by plaintiff.

Direct examination.

By Mr. Tracy:

I have examined Riggs' and Hansel's appraisals and the Master's report, and find no price fixed as of 1913 except Schedule 6, Ties,

the prices used being those of 1911 and 1912. The proper comparison to show effect of increased prices is between the prices of 1911-1912 and those of 1917. Mr. Caderette conferred with me regarding unit prices. I am familiar with those he used. The price for earth grading is low—lower than you would expect it to be done for in 1917. I did considerable construction work in 1917 but let no grading contracts; on one proposition, two miles of grading, I obtained figures from three contractors but they were so high I advised against acceptance. They were higher than the prices here used. Prices have increased more than the differences between the previous appraisal and the 1917 prices. Labor is a principal element of grading and the increase in labor 1911-1912 to 1917 has been approximately 50%; decreased efficiency makes the increases much more; we are not able to get as efficient men as in 1912. The prices used for rock and for clearing and grubbing are all low, in my judgment. In the 40¢ for grading, I figured shrinkage to be added to the yardage and that, where the work is not steam shovel, overhaul should be added. I do not think the 7.5% added by Riggs for overhaul, etc. ought to be included. I added 10% for shrinkage, drainage, road crossings, etc. The tie prices are too low to cover an average of 1917; they are made possible because of many settlers along the road where ties can be purchased in small quantities. Mr. Caderette's figures included no charge for handling. Tie prices went up rapidly after November 1916. 9¢ would be proper to take the ties from along the right of way to the material yard or deliver them to the track laying gang. That figure based upon
1567 cost would be: loading 4.5¢, hauling 3.78¢, loading 1¢, total 9.28¢. The prices we paid for rail in 1917 were rather more than those used by Caderette. Upon whether the increases in rail price is temporary or permanent, we have decided not to postpone our work to await lower prices. I think they won't be any lower for several years. Rail prices have been uniform for the last 15 years; other steel products have fluctuated but gradually raised. Under track fastenings, our angle bars have not cost quite as much as the figure he used. Track laying includes taking the material from the yards, laying it on the finished grade and spiking and lining it up. Surfacing is the taking of the material from the shoulders and sides of the track and putting it into shape so the track can be used without danger to trains and material until the ballasting begins. I do not think the track laying and surfacing could be done in 1917 for $900 a mile. It always cost me about $764 a mile and the increase in labor and train service is 50%, under present conditions. This is largely a labor item except the train service. We do not hope for any lower labor prices for some years. I think next year will be worse than last. Track laying machinery does not decrease the cost but makes it a little quicker. The 1917 unit price for ballast is made up of: Gravel in pit, 2¢; loading, 12.59¢; stripping pit, 2.25¢; pit tracks, 2.25¢; transportation, 20.5¢; cutting out between ties, 3¢; raising and tamping, 23.74¢; fixed charges on equipment, 6.45¢; total, 72 78¢ plus contractor's profit of 10%, equals 80.06¢. I think this price fair and conservative. I think the sand

ballast price too low. The only reason why cinders should be lower than gravel is because of the cheaper loading. I think Caderette's price fair for side tracks but not enough for mining tracks
1568 included in his side tracks schedule. I know the character of construction and of the rails, ties and side tracks of the plaintiff. The cost of labor and material has increased since 1912 and 1913 very materially.

Cross-examination.

By Mr. Groesbeck:

The price of rail, 1900-1916, was $28 a ton; in 1917 it was quoted at $38 for Bessemer and $40 for open hearth. The price advanced very rapidly on all classes of material in 1917, I presume due to the enormous demands for shell steel and export demand. I think the steel and other track material prices will remain where they are for sometime. We built no bridges and bought no bridge material since the winter of 1915-1916. Most roads obtain a price from a bridge company to build the bridge complete, though some do their own erecting. The shop plans are furnished by the bridge company but the original plans are furnished by the railroad. They are not standard specifications; every bridge is a proposition by itself—designed by itself.

When you make a cut with a steam shovel, all but large stumps are grubbed out with the shovel. On this line, St. Ignace to Marquette, there would be no steam shovel work; there is nothing east of Marquette sufficiently heavy to pay to transport a steam shovel over land to get it there. Where the embankments are over 2.5 feet high no grubbing would be necessary, but where under that, grubbing would be paid for. At present it would cost more to get the grubbing done than the price I approved. Out of 52.8, 100 foot stations in a mile, 40 would have to be grubbed. The price during 1917 would be $18, and in 1912 about $12 a station. The figures I approved are all based on the theory of reproduction new and on what I think 1917 costs would be.

1569 EDWARD S. BICE, a witness for plaintiff, produced before the Court on Nov. —, 1917.

Direct examination.

By Mr. Eldredge:

I am vice president of the First National Bank of Marquette having been connected with it 26 years in various capacities. The president resides in New York and I am in practical charge. I know the interest rate prevalent in the Upper Peninsula and along plaintiff's line, by having discounted paper and by making collections for other banks. We have loaned money at most of the principal places along the line. The rate of interest prevalent on secured loans is 7% in small transactions, and 6% in the larger. The 6% rate pre-

dominates. Of our local loans, 15% would be at 7% and 85% at 6%. This rate has prevailed ever since I have been connected with the bank.

Cross-examination.

By Mr. Carr:

On savings deposits we pay 3%, which is the customary rate with banks of the Upper Peninsula. That money is subject to taxation to its owner. The Marquette bond interest rate is 4% and 4.5%. There are no recent issues. The interest on local loans has remained stationary. Outside loans that we purchase in banking centers it has increased during the last 1.5 years due to the extraordinary conditions in the money market. Money rates for 2 or 3 years prior to the middle of 1915 were at a low ebb. Railroad obligations I have been familiar with, are from 4% to 6%, depending on the issue. The average rate of interest on railroad bonds in 1895 was approximately 4.69%. Prior to the commencement of the war, interest on railroad bonds had decreased to less than 4%.

Redirect examination:

1570 The rate of interest on a railroad bond depends upon the view of the public with regard to that particular railroad. I had in mind the rate of interest that the bonds bore. The rate of return would be higher—considerably so, at present.

Recross-examination:

4% bonds of the Pennsylvania & New York Central sold above par in years gone by. I think 4% bonds of the New York Central are along 94 or 95. I have not seen a recent quotation. These bonds are subject to taxation in the hands of the owner. In this State bonds of 2 or 3 years ago bore 4% interest. The first government loan was floated at 3.5%, the second at 4%. I am familiar with the Michigan law permitting the payment of a small specific tax on a Michigan bond or mortgage in lieu of other taxes. The prevalent rate of interest on mortgage securities along the line of the South Shore in Michigan is 6%.

1571 CHARLES F. LOWETH, plaintiff's witness recalled before the Court Nov. 26, 1917.

Direct examination.

By Mr. Tracy:

Qualifications given on previous appearance.

I testified previously in this case. Mr. Caderette conferred with me this summer to obtain unit prices to apply to 1917 values; I have since examined his unit prices in detail; I advised him at the time that I thought the prices were conservatively low; my subse-

quent examination has confirmed that. Since previously testifying I have verified the unit prices I then gave to be applied to items under grading. This by the experience of 5 years since the previous trial of this case and by price agreed upon between the C. & N. W. and the C. M. & St. P. for the transfer to the latter of a joint interest in a large number of mining spurs in the Upper Peninsula in the Crystal Falls and Iron River Districts. Agreements for that purchase were made early in 1915 and appraisals were made shortly before. The property was gone over by the engineering departments of both companies and the quantities ascertained. Prices fair and reasonable in the judgment of the engineering departments of both companies, were then applied. The prices for earth work were 30¢ and 33¢. The tracks represented different kinds of construction, were long and short and the work was both light and heavy. The unit prices on moving rock and clearing and grubbing were relatively the same to the prices applied by the Master, as the price for earth work and to which I previously testified. They were all higher. Values and unit prices were practically the same in 1913, 1914 and 1915. I believe the prices paid the C. & N. W. were fair to our Company as a purchaser. The grading prices in 1917 would be materially increased due to increased cost of labor, and other elements. The increase for earth work to 40¢ a yard for 1917
1572 would be fully justified as would the increase for rock, and clearing and grubbing. After study of the reason for increased labor costs and the probability of their being permanent: extending over many years there has been a decided and gradual increase in labor costs and very few instances of a general reduction; so far as organized labor goes, I think there has been a constantly ascending rate; unskilled labor is becoming more and more organized, so I think the same rule will apply to it; I think the tendency will be materially increased in future because of legislative recognition of the protection of labor; I think those tendencies are independent of abnormal conditions due to the war, that the war will aggravate the other tendencies and make less probable a reduction of present labor rates. The emmigrants will not come over in the future as in the past, as there will be more work and higher rates at home and less inducement to come to this country. I do not expect labor as entering into a railroad or its materials, to be materially lowered in the near future. We are not deferring any work on the score of high cost of labor, hoping it will be reduced. A recent investigation I made to determine fair average increases in the cost of structural steel for bridges in 1916 as compared with 1914, shows an increase of 69%. That was a fair average for the calendar year 1916. The difference to 1917 would be materially greater; Mr. Caderette's price of 7¢ per pound for steel in bridges in place, in 1917 as compared with 4¢ per pound adopted by the Master as of 1912 or 1913 is too low. The increase of $6 per thousand for timber in place in bridges in 1917 is less than should properly have been made. I base this on the increased cost of labor and lumber in 1917 over 1912. Increasing cost of piling in 1917 to 50¢ over the Master's 40¢ is very conservative. I have been over

plaintiff's road a number of times; made a special trip over it last June. I found it in very good condition and found the few
1573 bridges I examined in a very good condition of repair, also the rails, ties and ballast. They were in excellent repair for a railroad of that class. The unit price of $41.25 per ton for rail delivered along the bank ready to be placed in track, is too low, as not enough is added for handling. After study of the question I do not think there will ever be a return to the prices for steel that prevailed prior to the war. There may be lower prices than now prevail for some steel products, as some are very high. I doubt if there will be a recession in price for many years, if ever. I doubt if there will ever be any reduction in the cost of steel rails. Steel rails have been fixed arbitrarily for 16 years past and before the war there was much demand by steel manufacturers for an increase. It was brought about by the increased cost of steel products generally and by the railroad's demand for better quality of rail. The tendency of this demand for better rail was to increase the cost materially. For this reason I believe there will be no reduction in the cost of steel rails. I think the average cost to our road of track fastenings for 1917 slightly in excess of Mr. Caderette's price. Mr. Caderette's 1917 prices for ballast are reasonable and conservative. I do not think track laying and surfacing could be done for $900 a mile. I think $1200 a conservative estimate. We have used track laying machines on all classes of work, and my price would be based upon the cost so done. In reconstructing the plaintiff's railroad it would be impractical to lay the track by hand as it would be cheaper and take less time by machine. There is very little grading on this railroad which it would be economical to do by steam shovel, and there is much of it where a steam shovel could not be used at all. A steam shovel is heavy and cumbersome, cannot easily be hauled over country roads and does not pay unless the work is of
1574 such volume as to justify the cost of installing it. It is commercially impractical to construct your grade as you go along, moving the steam shovel on the track. That process would be very slow. It would be difficult to get steam shovels onto the South Shore and much of the work is of a character that it could not be done with steam shovel.

Cross-examination.

By Mr. Groesbeck:

Under certain circumstances it would be economical to transport a steam shovel over country roads. The work is sometimes done by first making a narrow cut to lay the tracks through a particular section, after which the steam shovels are brought in to move the earth and widen the cut, but that is not the customary way, nor is it practical railroading. If you had a location, such as that around Wetmore or Munising Junction, where there was five miles with 60,000 yards of earth work per mile, it might be more economical to put in a steam shovel and when you got through take it to another place of like character and repeat the operation if the other places were

such that a steam shovel could be economically and profitably employed.

This is providing the work where the shovel was first engaged could be finished in advance of the other work. A steam shovel will move a large amount of earth more quickly and cheaply than other methods. In my figures I have proceeded upon the cost of production new theory, assuming that the plaintiff's railroad would be entirely wiped out and the condition as it would be if the railroad was removed at this time. This would leave the country in natural condition with no grading or roadbed. I take away the South Shore leaving other railroads and highways as they are. I do not take into consideration the original cost, nor do I know it.

1575 It is doubtless true that the steel mills and manufacturers of locomotives have been increasing their capacity and output in the past two or three years, this being due to the use of the output as instruments of war. This is increasing and when the war ends it will be found that steel plants and like industries have increased their capacity to a very large extent. In my judgment when the demand for war materials ceases, the demand for other classes of materials will increase. I understand that the capacity to manufacture steel products and the efficiency of the plants, both in this country and in Europe, has been very largely increased. Laying track by machine is a common practice, and that is the proper way when there is any quantity of work. Such a machine costs about $3,000; properly mounted and supplied, under average conditions it will lay a mile or more of track a day; occasional records show two miles a day. In building a railroad the first thing is to make a survey, then acquire the right of way, then clear, build the sub-grade, ditch and put in bridges and culverts, build telegraph and telephone lines, then lay the ties, tracks and ballast.

Prices were about the same in 1911, 1912 and 1913, a little cheaper in 1914 and about the same in 1915; in the spring of 1916 there was a raise of 10 to 20%. Compared with the first time I went over plaintiff's railroad, its present condition has changed for the better. It has better ballast, its right of way and tracks are in better shape, and it is evident that the property has been very well maintained at least.

There is no doubt that the tonnage being moved in a train is today greater than a few years ago. The tracks purchased from the C. M. & St. P. by the C. & N. W., was a half interest in mining spurs

1576 already built and operated. We did not get quite the same rights as the C. &. N. W. as they reserved the right of operating over them in certain cases and doing our switching. We acquired very nearly the equivalent of a joint ownership. It was the equivalent for all practical purposes and in that deal we used the prices I have stated. When I stated steel bridges went up 69% in 1916, I referred to the entire calendar year.

Redirect examination.

By Mr. Tracy:

If the engineering on roadway and structures on this line could have been done in 1913 for $255,000, I think that a conservatively increased cost in 1917 would be 20%. I have in mind the cost of engineer's services and I perhaps under-estimated the small amount of common labor. It would be 25% or more as against Mr. Caderette's 30%. The work of a preliminary survey for construction of a line following the plaintiff's present line could not be done satisfactory to me for $100 a mile, and I do not see how it could contract for such work, as that requires skill, time and judgment.

My estimate of the cost of track laying and surfacing was derived from experience, both before I testified previously, and in work done since and in assembling information as to the cost on various railroads for the Federal appraisal. I know of no case where any railroad has reported track laying and surfacing as low as $900. Mr. Prouty conceded the cost for the Texas Midland, a light, poorly constructed road, should be $900 as a minimum. A steam shovel coul l be used on the plaintiff's railroad but generally would not.

1577 *Evidence on the Part of the Defense in Open Court.*

C. A. PARKER, recalled before the Court as a witness for Defendant, on Nov. 26, 1917.

Direct examination.

By Mr. Wykes:

(Qualifications set out in previous testimony.)

I previously testified in this case. The evidence of the various witnesses as to land values has been compiled by me in Defts.' Ex. 301, which places the testimony and a reference to the record page opposite each section of land. The exhibit is self explanatory.

I believe I have brought together all the testimony relating to country land values.

In Defts.' Ex. 302, is a computation of testimony regarding the value of plaintiff's land located to counties, showing the area, the witness whose testimony is accepted for the purpose of this computation, the record page, the price per unit of value whether by square foot, acre or otherwise. It is noted as to whether it is in railroad or non-railroad use, and those computations are extended to classify it as to freight and passenger, common freight and passenger, ore lands and the total value. This exhibit is in same form as plaintiff's exhibit before the Master and contains the same areas though somewhat differently divided. I have attempted to account for all lands and have applied the prices taken from the record, of the witness relied on by defendants. The property is then separated to services on the same basis as plaintiff used. This exhibit was before the Master but

has never been proven in any testimony. The final totals on Defts.' Ex. 302 represent defendants' claims. Defts.' Ex. 303 is a list of the assessed values of plaintiff's railroad 1902-1916 inclusive. The final assessed values being for 1914 and 1915, $10,500,000,
1578 and 1916, $11,000,000. (The reports of the plaintiff to the State Board of Assessors for 1914 to 1917 inclusive, were marked defendants' Exhibits, 1914 equals Ex. 304, 1915 equals Ex. 305, and 1916 equals Ex. 306. It is agreed between counsel that all the original reports of the plaintiff to the State Board of Assessors or Railroad Commission may be considered in evidence.)

Defts.' Exs. 304, 305, and 306, reports for 1914, 1915 and 1916, contain the following description regarding its real estate:

"Detailed statement of the real estate owned by the Company in Michigan on the 30th day of June, 1914, where situate and the value thereof. Then follows, description and location and the column provided for value. That portion of the Duluth, South Shore and Atlantic Railway situated in the State of Michigan as shown on page 13 of this report. The value of the following item- being taken together to make up the total value. Engineering, right of way and station grounds, real estate, grading, bridges, trestles and culverts, ties, rails, track fastenings, frogs, and switches, ballast, track laying and surfacing, fencing, crossings, cattle guards and signs, interlocking and signal apparatus, telegraph, station buildings and fixtures, shops, round houses and turn tables, water and fuel stations, warehouses, docks and wharves and miscellaneous structures, $8,244,-946.00. That is opposite the printed note Total in Michigan."

On page 11 of exhibit 304, being for the year ending June 30th, 1914, the page is headed "Personal Property" and requires an answer to the following:

"Detailed statement of all personal property, including moneys and credits owned in the state of Michigan on the 30th day of
1579 June, 1914."

Then follows columns headed, Description and Value. Then this is answered:

"Personal property of the Duluth, South Shore and Atlantic Railway Company situated in the State of Michigan as follows: Cash, stores and supplies, shop, machinery and tools, balance of accounts, ferries and a proportion of the total value of locomotives, passenger, freight and miscellaneous equipment, $2,900,000.00."

Approximately the same value appears in the reports of 1915 and 1916.

The report for 1914 contained the following affidavit:

"STATE OF MICHIGAN,
County of Marquette, ss:

I, the undersigned, A. B. Eldredge, president of the Duluth, South Shore and Atlantic Railway Company, on oath, do say that the foregoing return, except so far as the same attempts to give valuation of property, has been prepared under my direction from the original

books, papers and records of the company; that I have carefully examined the same and declare the same to be a complete and correct statement of the business and affairs of said company in respect to each and every matter and thing therein set forth, except the valuation of property, to the best of my information and belief; and I further say that no deductions were made, before stating the gross earnings or receipts herein set forth, except those shown in the foregoing accounts; and that the accounts and figures contained in the foregoing return embrace all the financial operations of said Company during the period for which said return is made.

I do further state that this Company is now engaged in litigation with the State of Michigan or its officers, in respect to the
1580 validity of the so-called Two Cent Passenger Fare Law, and therein the value of its property for rate making purposes, as well as the question of what property is used in railway operation, is in issue; that in said litigation the Attorney General and Railroad Commissioners allege and contend that the value of the company's property used for railroad purposes in Michigan does not exceed the sum of $11,000,000.00.

With reference to the property in the said report described on page 9 thereof, I have no knowledge or information, or present means of acquiring information, so that I can state the value of the same, or of the separate parts thereof, except I should base my judgment on the conflicting statements of witnesses who have sworn in the litigation above referred to, and therefore I directed that a valuation be given to the said property which, taken with the property described on page 11, would approximate the valuation given by me in the verification of the bill of complaint in the litigation above referred to.

With reference to the property described on page 11, I have no personal knowledge of its value, but I believe, from the information given me by the employees of the Company, that, as a part of a going railway earning a fair return on its investment, it is worth the sum named.

In valuing the real estate described on page 10, I directed that the assessed valuation thereof be used, except in one or two instances where I had reason to believe that the assessing officers had made their valuation in error by confusing one piece of property with another. In most instances under this heading I directed that there should be included the lands which in the past have been locally assessed, although I think it more than likely that the decision
1581 on the litigation above referred to may determine some of these lands to be in railway use, as also it may determine lands not to be in railway use, *as also it may determine lands not to be in railway use,* which have been so included in the value given.

It was my intention to arrive at a total value of the property operated by the company which should approximate the figures given by me in the verification of the bill of complaint above referred to.

It is my judgment that the value of the property of this company fixed by the State Board of Assessors for the fiscal years ending June 30th, 1912, viz. $9,600,000.00 is for the purposes of taxation, a fair valuation, when the value fixed upon the other property of the state

for like purposes is considered, and when the return received by this company on its business is considered.

(Signed) A. B. ELDREDGE,
President.

Subscribed and sworn to before me, this 17th day of September, 1914.

W. J. ELLISON,
Notary Public, Marquette County, Michigan.

My commission expires Jany. 6, 1916."

Defts.' Exs. 304, 305 and 306, contain statements of current additions and betterments. They are shown in net amounts to be:

1914	$104,309.12	
1915	55,516.20	reduction
1916	114,654.90	"
Total	$65,861.98	net reduction.

The report of the company, Defts.' Ex. 306, states additions and betterments July 1, 1907, to June 30, 1917, as a net increase
1582 of $1,376,256.82.

The plaintiff's reports to the State Board of Assessors for 1912 contained the following affidavit:

"STATE OF MICHIGAN,
County of Marquette, ss:

I, the undersigned, A. B. Eldredge, President of the Duluth, South Shore & Atlantic Railway Company, on oath do say that the foregoing return has been prepared under my direction from the original books, papers and records of said company; that I have carefully examined the same and declare the same to be a complete and correct statement of the business and affairs of said Company in respect to each and every matter and thing therein set forth to the best of my knowledge, information and belief; and I further say that no deductions were made before stating the gross earnings receipe herein set forth, except those shown in the foregoing accounts; and that the accounts and figures contained in the foregoing return embrace all of the financial operations of said company during the period for which said return is made."

That is the end of the printed form, and following that in writing appears the following:

"I further state that the valuation of property, except as otherwise appearing, are my estimates of the value based upon earning capacity of the property, and that I have no other means of personally making a valuation, and further state that I do not know the value of the

lands listed as not used in operation and I believe that some of the lands so listed are in fact used for railway purposes; that this is a matter not easy to determine and is now involved as a legal question in a suit between the Railway Company and the State.

(Signed) A. B. ELDREDGE,
President.

1583 Subscribed and sworn to before me at Marquette, Michigan, this 14th day of September, 1912.

W. J. ELLISON,
Notary Public.

My commission expires January 6, 1916."

The valuation claimed that year by the Company was: Real estate $9,117,946; Personal, $2,027,000. The report for 1913 contained an affidavit similar to that of 1912. The amount reported for taxation for 1915 was: Real estate $8,244,946; Personal $2,900,000.

Defendants' Ex. 307 (introduced in evidence) is a statement of the investment in road and equipment for Michigan, being a statement of additions and betterments by years, the first three years, 1914, 1915 and 1916, being compiled direct from the annual reports of the Railroad Company to the State Board of Assessors for those years. The fourth column of figures headed "Parker" is an assignment for the year ending June 30, 1917, which is made by me on the bases which were used in the previous years, that is, the comparable bases, namely, road miles, and that data was furnished me by Mr. Delf.

This exhibit was correctly prepared by myself. I acquired information as to additions and betterments for the entire line and assigned engineering, shop machinery, equipment, etc., to Michigan on bases used in previous years by the Company. The fifth column shows the totals for the four years. The red figure indicates a net deduction, indicating some retirement of property. Defendants' Ex. 308 shows statistics of plaintiff's passenger, ore, and freight traffic.

They are passenger and freight and separately the ore freight statistics of the D. S. S. & A. such as were available to me from 1902 down to the end of the fiscal year 1917. They show the passenger train miles and car miles, average number of cars per train mile, passengers per car mile and per train mile, all passenger
1584 miles or the number of miles travelled by passengers, and that is subdivided into inter state and intra state by figures taken from records in this case. And under the freight statistics, shows the freight train miles, the freight car miles, average number of cars per train mile, the ton miles of freight, average ton miles per train mile, average tons per car mile, and then a subdivision of that, of the freight statistics indicating the ore business separately. These figures were compiled from the plaintiff's records except the inter and intrastate passengers one mile, which was taken from the records in this case. The statistics regarding the ore business were furnished to me by the Company. The average tons per train mile is shown to be: 1911, 241.27 tons and 1917, 348.06 tons. These are correctly

compiled by me from reports of the Company. (Exhibit 308 introduced in evidence.)

Defendants' Ex. 309 is based on the train consists of various trains over plaintiff's road, and shows: first column, weight of locomotives; second column, weight of baggage, mail and express cars; third column, weight of coaches; fourth column, of diners; fifth column, of sleepers, last column, total weight of train. Train 3 and 4 is a heavy train, C. & N. W. Copper Country Express to and from Chicago. My computations show that the foreign sleepers on trains 3 and 4 and C. M. & St. P. trains 103 and 104, Chicago to Copper Country, and back, and the sleepers separated from those trains and run into Marquette, for 1916, carry an average of 4.87 passenger miles per car mile. That is, all inter and intra passengers on the sleepers were less than five passengers per sleeper. These are the interstate trains to and from Chicago. The sleeper on the Soo route, Detroit to the Soo and return, 1916, 9.62 passengers and in 1917, 10.87. Of the 639,967 passenger miles in the Soo route, sleepers for 1916, 564,155 or 88.15% were intrastate, that is 8.48
1585 passengers per car out of a total of 9.62 were intrastate.

Out of 686,509, passenger miles on that route in 1917, 608,526 or 88.64% were intrastate, being 9.64 intrastate passengers out of a total of 10.87.

The same analysis for the foreign or interstate sleepers to and from the Copper Country and the Marquette on C. & N. W. trains 3 and 4 and C. M. & St. P. 103 and 104 and D. S. S. & A. trains 10 and 11 Negaunee to Marquette and C. & N. W. train 110 with Chicago sleepers the trains being essentially interstate, shows that out of a total for 1916 of 733,267 miles, 118,509 or 16.16% were intrastate. This was .79 of one passenger intrastate of a total of 4.87 passengers per car mile.

Over the same route out of a total for 1917, of 759,691 passengers, 106,763 passengers miles or 14.05% were intrastate, this being .71 passengers per car mile out of a total of 5.04.

Trains 3 and 4 and 103 and 104 which are the interstate trains to the Copper Country require pusher service up the L'Anse hill on the return trip going south and east, and No. 7, is pushed up the hill out of Marquette going west. The statistics shown on Defts.' Ex. 309 were correctly compiled by myself. Defts.' Ex. 310 prepared and correctly compiled by me, divides passengers carried in foreign sleepers between interstate and intrastate. The figures are comparable with Mr. Delf's, though his exclude the passenger miles made on the Mineral Range, while I did not. Defendants' Ex. 311 is the detail to show the number of passengers carried on the several routes and the passenger miles made in Michigan both total and intrastate and the percentage of intrastate for 1916-1917. For comparison I have in-
serted Delf's figures below the line in each instance. My
1586 statistics regarding travel in sleepers were taken from the conductors' cards and the consistent difference from Delf's figures from month to month indicates that he has included the haulage in sleepers on the Mineral Range. The computations are correctly made and figures correctly set down on Defts.' Ex. 311.

Defts.' Ex. 312, shows the passengers in D. S. S. & A. sleepers as distinguished from those in foreign sleepers. This is based on Mr. Delf's figures with a deduction, based on investigation and records, on account of the Mineral Range and the figure below the line in each instance is our figure for the total passenger miles in sleepers and the intrastate. These computations were correctly made. The latter sould be 1917, not 1916.

Defendants' Ex. 313 is a comparison of the passenger miles in sleepers with the passenger miles on plaintiff's railroad. The upper half shows the total passenger miles for 1916, being the same as Delf's, and the percentage relation of intrastate and interstate to the total; below, separately totaled, are the passenger miles in sleepers, the Soo route being 88.15% intrastate and 11.85% interstate. Out of the total passenger miles 29,683,083, the number in sleepers was 6,049,936, or 20.38%, there being 8.81% of the intrastate passengers and 48.44% of the interstate passenger miles which were made in sleepers. The percentages for 1917 are shown at the bottom and the figures on the exhibit were correctly compiled. (Ex. 313 introduced in evidence.)

Defts.' Ex. 314 shows the average weights per revenue train mile of plaintiff's train for the fiscal years 1912-1917. Each class of traffic is subdivided to show weight of locomotives, and cars by classes and the traffic. Using 1912 as an example: the first column is
1587 aggregate ton miles passenger, and the different headings distribute those tons between the different elements of the passenger service. The first column under freight is the total ton miles for the year, and the ton miles of each part of the train and the average are shown. The ten ton factor used for passenger loading is an estimate and is divided between mail and express and passenger and baggage. The locomotive weight takes for its basis the weight of the locomotive and tender in working order plus 60% of fuel and water capacity. The mail and express and baggage are arrived at on the space basis. The figures were taken or based upon weights as determined from Company records. They are all based on individual weight units in both passenger and freight services and are correctly taken and applied by me. Defendants' Ex. 315, shows the average weight of plaintiff's passenger equipment per car mile for 1912, 1913, 1914, and 1917 divided into the three groups, sleepers and diners, mail and express, passenger and baggage. The average is stated in tons. This shows an increase in the weight of sleeper and diner equipment in 1917 over previous years; over 1912 of approximately 10 tons per car. I assumed 1915 and 1916 would show approximately the same results as for 1914 and 1917. The weight of mail and express equipment increased 1912-1917 about 13%+.

Upon investigation I find that of the total passenger train car ton miles in 1916, 36.10% were devoted to carrying the intrastate passenger and his baggage; 9.49% for interstate; in the sleeping car subdivision 19.13% of the total car ton miles of the trains were interstate, 7.84% intrastate, 13.13% mail and express, and 14.31% dining. To serve a single passenger they carry in the baggage part of the train .47 of a ton; in the passenger section of the train,

meaning coaches, 2.61 tons; for the Soo route sleepers 7.88
1588 tons, for the C. & N. W. and C. M. & St. P. sleepers 14.64 tons, and D. S. S. & A. sleepers 6.36 tons per passenger mile on the average. The highest proportion of tonnage to the passenger is on the interstate trains 3 and 4 and 103 and 104.

The Marquette & Western line is the so-called south track Marquette to Eagle Mills and part of the line to Winthrop Junction which is 17.3 miles from Marquette. It was originally built by interests connected with the Detroit, Mackinac & Marquette to serve the ore country; that line makes practically two lines from Marquette west for a distance of 17 miles through the ore district; that track is used by every west bound passenger train originating in Marquette. It is in constant use in common service from Marquette to Eagle Mills; the north line is the old M. H. & O. line and goes straight west from Marquette.

Referring to the report of the Railroad Commission for 1885, year ending Dec. 31, 1884, the Marquette and Western filed articles October 12, 1883; was open for use June 9, 1884. The Company's report of operation from June 9 to Dec. 31, 1884, shows average receipts per passenger mile 2.38¢ for all freight 2.20¢, through freight 2.15¢. 302,000 out of a total of 317,000 tons of freight hauled were ore. The average amount received for each ton hauled was 39.05¢ and the ton miles of through freight 5,349,061, and local freight 283,764, totaling 5,632,825. The number of passengers was 28,613, the passengers mile 304,411. The total income was $134, 328, being passenger $7,281.59 and freight $124,483.27.

The M. H. & O. report shows the following statistics for the entire year 1884; total tons of freight 870,749, of ore 765,199 total ton miles of freight 25,767,000. Receipts per ton hauled 81¢ per ton mile through freight 5.7¢ and local freight 2.6¢. The average rate per passenger mile was 3.7¢ being for through passengers
1589 3.95¢, and local passengers 3.66¢. The M. H. & O. report for year ending Dec. 31, 1883 shows average rate of fare per passenger mile 4¢, being the same for through and local. The rate per ton per mile was 3.41¢ being through freight 6¢ and local freight 3.24¢. The average received for each ton hauled was 81¢.

The report of the Marquette & Western for 1885 states that all the shares of its capital stock are in the treasury of the M. H. & O. which is to operate it perpetually, and that possession was given in May 1885. In the balance sheet of the M. H. & O. for 1885 under the classification "Other Investments" the M. & W. is listed at $2,011,346.93.

I have before me the report of the D. M. & M. for the year ending Dec. 31, 1881, which has a bearing on the original cost of construction on the portion of plaintiff's line east of Marquette. It states that the main line from points St. Ignace to Marquette 151.90 miles was completed and turned over to the Railroad Company Dec. 1, 1881. Page 9, calling for cost of road and equipment indicates that the road cost $2,528,963.62, being, construction, $2,350,972.97, and equipment $177,990.65 or $16,638 a mile. The items are:

	1, grading and masonary	$569,403.94
	2, bridging	133,819.86
	3, super. tructure, including rails	1,349,892.28
	4, land, land damages and fences	72,431.77
	5, passenger and freight stations, woodsheds and water station	32,565.49
	6, engine houses, car sheds and turn tables	23,178.68
	7, machine shops	3,098.76
	8, interest paid during construction, discount, etc., no return made for it.	
	9, engineering, agencies, salaries and other expenses during construction	133,873.65
	10, all other items charged to construction not enumerated above	32,708.54
1590		
	11, total expended for construction	2,350,972.97
Item	14, locomotives	61,843.43
No.	15, snow plows on wheels	
No.	16, passenger, mail and baggage cars	28,369.32
No.	17, freight and other cars	78,021.05
No.	18, machinery and tools	9,756.85
No.	19, total for equipment	177,990.65

Those figures were crossed out with red ink and a note placed at the bottom of the page which reads:

"The road was built by construction companies who received in payment therefor the stock and bonds of the railroad company."

(Report of the D. M. & M. for 1881 marked Defts.' Ex. 316.) The property was then carried carried into the report at $12,041,-892.01, or about four times the stated cost of construction. The report includes 13.5 miles for sidings.

Plaintiff's railroad was extended west from Michigamme in 1886-7. The Railroad Commission for 1887 reports as follows:

"The Duluth, South Shore and Atlantic Railway Company has also been formed by the consolidation of the Sault Ste. Marie and Marquette and the Mackinac and Marquette Companies of Michigan; the Wisconsin Sault Ste. Marie and Mackinac of Wisconsin and the Duluth, Superior and Michigan of Minnesota. The above consolidation gives the Upper Peninsula a through line from the Soo, there connecting by bridge now nearing completion over the Sault Ste. Marie river, with the Great Canadian systems of roads to the Atlantic and at Duluth with the Northern Pacific to the Pacific Ocean. This Company also has the work of construction well in hand and will soon be ready for the immense traffic that must of necessity come to it with the completion of its through line."

(Defts.' Ex. 317, being the articles of consolidation, of the
1591 Marquette & Ontonagon and Houghton & Ontonagon Railroad Companies, forming the M. H. & O. filed Sept. 2, 1872, produced and introduced in evidence. This exhibit same as Defts.' Ex. 55 before the Master.)

"Mr. Tracy: I might say to the Court, so there will be no misapprehension, that it shows by the record in the case that that figure of nearly Fifty Million Dollars is not claimed by us, and never has been claimed by us, to be the value of this road. It is a one column figure which is arrived at by the old system of bookkeeping, on which they set out their investment in the road and everything they added they added to that column and they never took anything off; so the result of it is, it is absurd to show this Court that enormous sum. After the Interstate Commerce classification was adopted, they changed their method and now add only the net amount.

Mr. Wykes: Do you now admit Mr. Tracy, that you claim nothing for your cumulative figure or investment?

Mr. Tracy: Nothing.

Mr. Groesbeck: You set up there interest on these Fifteen Millions of bonds as a charge against this property, the interest on them as one of these obligations and debts?

Mr. Eldredge: We do.

Mr. Groesbeck: You claim that that money went into the corporation?

Mr. Eldredge: I don't claim anything about it, for I don't know anything about it, only what our books show. We claim it is a lien on that property."

The articles of the Mackinac & Marquette Railroad recite a sale on mortgage foreclosure of the D. M. & M. to Hugh McMillan in 1886
for 1,010,000+, that the property was carried into a new cap-
1592 italization of $3,040,000.

(Defendants' Ex. 317 is the articles of the Duluth, Superior & Michigan; Defts.' Exs. 313-317 introduced in evidence.)

Cross-examination.

By Mr. Tracy:

I do not mean that trains 3 and 4 and 103 and 104 do not carry intrastate passengers. I stated that they were of the character of an interstate train and passengers do travel on them between local points in Michigan. So far as they run on the South Shore tracks, the run is entirely in Michigan. The south line Marquette to Eagle Mills is used as a loop or double track.

1593 CRESCENT A. PARKER recalled.

Direct examination.

By Mr. Wykes:

The operating ratios (being the percentage of expenses to revenues) of plaintiff in Michigan and outside of Michigan, on the basis of the exhibits of the various experts, are as follows:

Year.	Outside Michigan			Michigan.		
	Delf.	Parker.	Hillman.	Delf.	Parker.	Hillman.
	%	%	%	%	%	%
1914.....	96.78	98.02	100.06	77.87	77.67	78.42
1915.....	111.40	111.56	111.20	76.39	76.37	77.55
1916.....	89.87	91.45	91.10	67.89	67.67	68.03
1917.....	97.84	99.45	98.84	71.64	71.30	71.52

I have recently analyzed plaintiff's accounts for the years ending June 30, 1914 to 1917, inclusive, and separated them to states and services, the results of my separation being set forth in Defts.' Ex. 325.

In general, expenses have been allocated to states and to services to the fullest extent possible, and, where accounts were not allocated, we have used the nearest possible use basis we could find to assign to states and services. The system totals are the same as Mr. Delf's. Mr. Delf and I are agreed on most of the allocated accounts.

After making such allocations as were possible, and then dividing such further accounts as possible on some basis that represented the use for specific accounts, the proper basis and basis used, for the remaining common expenses in the maintenance of way group was the gross ton mile and time basis.

In that group, in 1917, $301,025 was assigned on the gross ton mile basis, and $103,605 on the time ratio.

Referring to pages 695 and 696 of Defts.' Ex. 325, 1917, summary of expenses, the first group is maintenance of way and structures; on the system total I agree with Mr. Delf throughout; the next
1594 column, total expenses for Michigan, is my result after separation between Michigan and outside of Michigan. My total for this group is $1,986 less than Delf's Michigan total for the same, the principal difference being found in the accounts 231, Water Stations, 233, Fuel Stations, 235, Shops and Enginehouses, 247, Telegraph and Telephone Lines, and 275, Insurance. The reason for the difference is that I accept the facilities represented by the first four accounts as being system facilities, and assign them to Michigan on a basis of use, regardless of the geographical location of the structures; e. g., the principal shops are located in Michigan, but I have assigned them on some near factor or basis of use.

The same is true of the other accounts mentioned, water and fuel stations being assigned on the use of fuel in and out of the state, and shops on a ratio of use represented by the repairs therein for Michigan and outside Michigan, and enginehouse expenses on the ratio of apportionment of the expenses of yard and road locomotives between states. Telegraph and telephone line expenses were first divided to freight and passenger on the basis of time and freight and passenger train miles respectively in states.

The differences enumerated would also make a slight difference in the items assigned as overhead, e. g. superintendence.

Under maintenance of equipment, page 697 of Defts.' Ex. 325, I have assigned $252 less to Michigan than Delf has, this being due

to the assignment of the accounts, repairs, depreciation and retirements of work equipment, which are assigned by each of us as overhead to the maintenance of way group.

Under traffic expenses, page 698 of the exhibit, there is no difference between Delf and me in Michigan totals.

Under transportation expenses, page 700 of the exhibit,
1595 I am $5,797 less than Delf for the entire group assigned to Michigan, the greater part of the difference being in accounts 392, Train Enginemen, where I accepted the engine mile basis for the division to Michigan, and 401, Trainmen, where I accepted the train mile basis for the division. Mr. Delf claimed location for 392 and 401. I rejected this, as he totaled the time spent by enginemen and trainmen outside of Michigan and deducted it from system totals, the result being that delays in traffic on account of connections and duty time would all be left in and increase the Michigan portion of the expense.

My method and result is to distribute the duty and delay time over the entire system. Thomaston, the division point, is about 14 miles into Michigan; there, engines and cars are changed for certain trains and crews are required to report 30 minutes in advance of the run, which is duty time; there would be duty time at the other end, but the mileage is a disporportionate, being 14 miles against 109. Mr. Delf divided enginemen on the time slips.

In group, Miscellaneous Operations, page 700 of Defts.' Ex. 325, there is no difference between Mr. Delf and me in Michigan totals.

In General Expenses, page 701 of the exhibit, I assign to Michigan $364 less than Delf. This difference exists by reason of the previously emunerated differences, the group being assigned as overhead to previous accounts. In the total assignment to Michigan, I am $8,402 less than Delf.

In the next (3rd) column of the 1917 summary, freight, I am the same as Delf as to allocations. Delf's exhibit, however, had no comparable column. The amount set off by Delf to expenses of maintenance of exclusive freight trackage we do not regard as allocations. I have used the equated track mile basis to divide
1596 that character of expenses. In the equated track mile basis we have taken in certain of the sidetracks and spurs on the basis of two miles of such track equaling one of main track and major branches. My ratio on that basis is ratio #2, given for 1917, on page 524 of Defts.' Ex. 325. This ratio was used to determine what amount should be set out of the common expenses to represent the total expenses of maintenance of exclusive freight trackage.

Page 524 of the exhibit shows how the equated track mile ratio is arrived at, the equation being that each mile of main line and second track are taken as one, while each mile of spurs and sidings is taken as one-half mile; treating the total equated mileage as 100 per cent, freight is found to be 17.28 per cent common, 82.52 per cent and passenger, .20 per cent. This is on the assumption that it costs as much to maintain one mile of main line track as two miles of industrial spurs and sidings. The application of the percentage is found on page 545 of the exhibit.

The total amount set off to exclusive freight track maintenance in 1917 was $73,538 and to passenger $851.

To compute the time ratio, Number 4 (Ex. page 527) we found the time of the passenger and of the freight trains in the use of the track. Time in movement only is shown, the non-movement time being excluded, and the time on exclusive tracks being deducted. The ratio is the use of track in switching or road service on the common track represented in the time consumed by each service. The switching time is computed at six miles per hour.

To illustrate the method of application of my ratios, using account 202, Roadway Maintenance, page 545 of Defts.' Ex. 325. Line one indicates the total expenditure shown by the company books for the entire system, $67,154. Delf's allocation to Michigan of $51,502, was accepted. This is made up of the sub-
1597 primary accounts shown. On lines 9 to 13, the separation on account of equated track is shown, the remaining common being $42,499. This common is on lines 15 to 17 separated to passenger and freight on the time ratio, number 4, above explained. The time ratio is used because practically all of the expense of the item is the result of depreciation from natural causes not associated with the movement of trains or tonnage. On lines 18 to 25 inclusive, the freight and passenger assignments previously made are brought together, producing a passenger total of $6,959. On lines 26 and following, this passenger total is subdivided to services on the basis of the total passenger train car miles, ratio number 3, explained on pages 525 and 526 of the exhibit.

In arriving at the train car mile ratio, number 3, the mileages made by the respective cars are shown, except where, as in case of mail, express and baggage, but a part of the car is used, then but a proportional part of the car's mileage is included. This ratio is used to divide common passenger expenses between the three services, sleepers and diners, mail and express, and passengers and baggage. On lines 30 and 31, the Michigan passengers and baggage expense is arrived at as $5,696. Lines 32 to 34 divide that expense on ratio 10, from page 529 of Defts.' Ex. 325, being the ratio of passengers carried one mile in intrastate and interstate to the total Michigan passenger miles.

Using the account, 202, to illustrate my difference in percentage from Delf. We start with the same Michigan total $51,502. We then differ in the amount deducted for exclusive freight. To the remaining common he applied the modified revenue train mile percentage of 42.21% passenger and I apply the time ratio of 23.09% passenger. In other accounts, where I used a gross ton mile factor, the passenger percentage was 25.98. Mr. Delf uses no ratio
1598 comparable with my ratio 3, but does use a ratio comparable with my ratio 10, there being no real difference between us on this. The net result of my computation is to attribute to intrastate passenger 70.67% of 57.19% of 23.19% of 82.72% of the amount attributed to Michigan. The amounts from page 545 are then carried forward into the summary on page 695.

In instances, as account 208, Bridges, Trestles & Culverts, page

546 Defts.' Ex. 325, there was a direct allocation to freight and no necessity of applying the equated track ratio, number 2, or any other factor

In account 218, Ballast, page 548 of the exhibit is a sample of the Michigan common divided to passenger and freight on the basis of the gross ton mile ratio, number 1; this ratio for 1917 is shown on page 521 of the exhibit. This ratio is made up of the gross ton miles made in freight and passenger services respectively on the common tracks, including switching. To construct this ratio, average weights, of the company's freight cars, as determined by scale weights, and ownership by classes, were taken. For foreign cars, tested average scale weights were taken and correctly applied to cars of the class. These weights were affected with mileage by classes to compute the ton miles.

For the locomotive, its weight including the tender and 60% of its loading capacity for fuel and water is taken and affected with its mileage in each service. For passenger train cars, we ascertained the average weight by classes, and applied that to Mr. Delf's Michigan mileage, assuming 10 tons to the train load. The tonnage of freight train traffic was furnished company.

The switching ton miles made on common track is a compilation of the ton miles of locomotives plus an average of 4.08 cars in the freight yards for freight switching for the yard move-
1599 ment, and 1.44 cars for the passenger yard movement, and 2.5 cars for the freight train switching movement, and 3 cars for the passenger train switching movement, these averages of cars for freight yard movement being determined by our men in connection with the yard tests, and for train switching by a study of the number of cars handled at way stations.

The ten tons for passenger loading was based on the assumption of about 300 pounds per passenger per mile for the passenger and his baggage and an arbitrary amount for mail and express. The train loading in freight is nearly 40 per cent of the whole, while in passenger it is three plus per cent. The passenger equipment is not materially changed by the loading, while the freight loading is sometimes two or three times the weight of the cars. I divide on the gross ton mile ratio, 25.98 per cent passenger for 1917, certain accounts which Delf divides on the modified revenue train mile ratio, 42.21% passenger for 1917. The difference, for 1917, in Delf's separations and mine is that in the assignment to passenger service I am $89,756 less.

After allocating property to the fullest extent possible, I would apply the method of time to the common property, to divide between passenger and freight. That is the use the property has had, measured by time. Before the Master we used that as one ratio or method, then showing a passenger proportion of 34 or 35%. The charge for use of property is analogous to a rent charge for use. I don't feel there is any necessity for dividing the property on the basis used for expenses. I don't think the use of the property is fully measured by the expense. Assuming the two theories correct, I see nothing

inconsistent in dividing the property on the modified revenue train mile ratio and the expenses on the gross ton mile ratio.

1600 The Master found against us on the use of time for the division of property. Assuming him to have been correct, I still think my ratios for the division of expenses are more nearly correct.

Ratio 1*a*, page 522 of Defts.' Ex. 325, is a subdivision of the ton miles made in passenger service to the several services constituting the entire business; i. e., a classification of the ton miles similar to that of the car miles under ratio 3, page 525 of the exhibit. I have taken the tonnage of each service shown, to reach a ratio or relative percentage to the total of the passenger tonnage. Those percentages are used to subdivide the passenger proportion of the expenses into sleepers and diners, mail and express, and passengers and baggage, as on lines 22-23, page 548 of the exhibit.

The ton mile ratio number 1 is applied to 212, Ties, page 548, for the reason that it is considered that the majority of expenses of renewal of ties is because of traffic—that they are worn out. I believe this, even though a tie would rot out if it never had traffic over it. The spikes are shaken so the water gets in and completes the destruction, but much of the destruction of ties on this road is caused by the cutting of the tie through rail pressure, which wears them out. The majority of the necessity of renewal falls in this group. Much tie renewal comes because before the tie is worn out the rail is ren-wed, thus destroying the tie, as it would not be economy to put a new rail back on the old tie after it had served part of its purpose. The tie would have served under that rail for a longer period than it did, but for the renewal.

Where I regard the wear as the greatest element of depreciation and of cost of maintenance, I apply the ton mile ratio, and where the majority occurs through the passage of time, I apply

1601 the time ratio. Where the tonnage ratio was applied, it was used for the division between passenger and freight of the common expenses, and also for the separation of the common passenger expenses between passenger services, to the point of getting the final passenger amount.

I divide the passenger expenses between sleepers and diners, mail and express, and passengers and baggage, while Mr. Delf uses the total passenger operating expenses as passenger, including sleepers and diners, and mail and express, excluding the directly-charged costs to sleepers and diners, meaning what is reserved and paid out because of sleeping accom-odations, and at the end Delf has eliminated the mail and express in a gross sum.

Referring to account 201, Superintendence, under Maintenance of Way and Structures, the charge as to Michigan and to the several services has been made relatively with or overhead to other accounts throughout the group. This is substantially the method adopted by Mr. Delf, and the resulting differences are caused by the mathematics of the problem; i. e. the different figures going into the totals. I charge 20.61 per cent to passenger, as against Mr. Delf's 36.07%, for 1917, and divide $4,451 as against his $7,811 of passenger to

passenger services, the difference being due to my use of the equated track basis and of the time and ton mile ratios, as against his different separation of exclusive freight track expense and his revenue train mile ratio.

I subdivide the $4,451 between sleepers and diners, mail and express and passengers and baggage, giving $2,263 to be divided between interstate and intrastate passenger, as against Delf's $7,811. The great difference occurs through my elimination of the cost of sleepers and diners and mail and express.

1602 In account 227, Station and Office Buildings, page 557 of Defts.' Ex. 325, the amount allocated to Michigan is $11,754. After arriving at the common portion of this item, on line 9, the amount $4,362, is divided on my ratio 17, which is the relation of the allocated station pay rolls for freight and passenger employees for the various stations in Michigan. At certain stations, there are employees whose duties are exclusively in passenger service, the pay roll charges for them being against the specific service and I have treated those two classes of direct charges as allocations.

Accounts 231, Water Stations and 233, Fuel Stations, page 560 of Defts.' Ex. 325, show special treatment, in that they are divided on the basis of the fuel and water accounts under transportation. This is practically the same as Mr. Delf's method.

Account 235, Shops and Enginehouses, page 561 of the exhibit, also shows special treatment, the items being regarded as overhead to repair of equipment accounts 308, 314, and 326, this method being pursued throughout.

Accounts 247, page 566 of the exhibit and 249, page 567, are subject to special treatment, as shown by the exhibit. The following sheet shows the amounts I allocate and assign on the various bases used:

1603 *Maintenance of Way and Structures.*

1917.

(Parker.)

	Total Michigan.	Freight.	Passenger.
Accounts Allocated	$70,739	$66,780	$3,959
Accounts Assigned on Equated Tracks	74,389	73,536	851
Accounts Assigned on Time Basis	103,605	79,736	83,869
Accounts Assigned on Gross Ton Miles	301,125	222,392	78,233
Accounts Assigned on Various Bases	11,945	9,424	2,521
Accounts Assigned overhead to others	31,602	25,087	6,515
Total	$593,405	$477,457	$115,948

1604 A number of items under Maintenance of Way and Structures are assigned as overhead to other accounts, being 269, Roadway Machines, 271, Small Tools and Supplies, 274, Injuries to Persons, 275, Insurance, 276, Stationary and Printing, and 277, Other Expenses. These expenses are incurred along with other expenses, and it is natural to expect they would follow in the same way. On this entire subdivision, Maintenance of Way and Structures, I have for 1917, assigned to passenger $89,756 less than Delf.

Under Maintenance of Equipment, 1917, page 585, of Defts.' Ex. 325, the only difference between Delf and me appears in the accounts 326, Work Equipment—Repairs, 327, Work Equipment—Depreciation, 328, Work Equipment—Retirements, and 333, Insurance, and is due to the fact that we both assigned the accounts as overhead to other accounts to which we have made different assignments, thus producing a different percentage.

Under the Maintenance of Way and Structures group, I deduct from several accounts a proportional charge for the maintenance of equipment on account of operations of the equipment on the tracks of the Mineral Range; e. g., under account 308, Steam Locomotives—Repairs, page 189 of Defts.' Ex. 325, line 28 shows the Michigan passenger proportion divided relatively with the total passenger train locomotive mileage on the Mineral Range and the D. S. S. & A. Here we have used the mileage on the Mineral Range being 4.39% of the total locomotive mileage, which results in a charge of $2,123 on account of steam locomotive repairs to the Mineral Range and carried as a decrease against the total charges in Michigan passenger service.

Certain D. S. S. & A. trains operate over the Mineral Range tracks, Houghton to Calumet. The Mineral Range gets the fares and
1605 this company pays the expense. It was necessary, in order to find out the cost of business on the D. S. S. & A. to deduct expenses which were off the line. 43,000 miles of the plaintiff's locomotive operation represents the mileage of D. S. S. & A. trains and of C. & N. W. trains 3 and 4 and C. M. & St. P. trains 104 and 104, between Houghton and Calumet, on the Mineral Range. This company has the entire train expense, and I have thus taken out from our expenses the proportional part that would be caused by the operation on the Mineral Range. To indicate the method and amount of expense charged out on this account, refer to summary of Maintenance of Equipment, pages 696 and 687 of Defts.' Ex. 325. There will be found a column headed "Mineral Range," and in that or a similar column throughout the summary appears the amounts charged out of the plaintiff's expenses on account of the Mineral Range operations; that figure is not included in the total figure, which is the next column of plaintiff's passenger expenses. The totals of the column shows what is excluded on account of the Mineral Range. Mr. Delf makes no similar exclusion; it is included in his total passenger.

My charges to the Mineral Range in this group (Maintenance of Equipment 1917) are $4,432, to plaintiff $104,136, total $108,568, being $3,056 less than Delf's $111,624.

Under Traffic, my Superintendence should be corrected to be

overhead to the group, which would decrease my intrastate net passengers and baggage expenses for the entire group from $13,576 to $8,356. Before the charge, Mr. Delf and I are the same.

Under the group "Transportation," account 372, Dispatching Trains, page 626 of Defts.' Ex. 325, the system total is divided to passenger and freight on the system time ratio, 42, and the freight and passenger assigned to Michigan on the basis of the freight and passenger train miles respectively, including switching operations, thus bringing slightly more into Michigan than Delf.

1606

The Michigan passenger item is then divided into its several subdivisions on the passenger train car mile ratio, 3, page 525 of the exhibit.

In account 373, Station Employees, page 627 of Defts.' Ex. 325, the common has been divided to passenger and freight services on pay roll ratio, No. 17, page 530 of the exhibit. After allocation was made to freight and passenger and checked over by Delf and ourselves, the common item, $84,073, lines 4 and 6, is the same as used by Delf. The 10% set off to mail and express is arrived at, as indicated on page 627 of the exhibit, on an investigation indicating that over 10 per cent of the item was directly incurred on account of the mail.

Account 376, Station Supplies and Expenses, is divided in the same way as account 373. There is no subdivision of items 373 and 376 to outside operations except the 10 per cent to mail and express. A considerable difference exists between Delf and myself on these items, my assignment to passenger being, for account 373, $20,792, and for account 376 $1,734 less than Delf.

On Accounts 377 to 390 inclusive, Mr. Delf and I agree on the assignment to passenger services. We agree substantially on account 391.

Certain accounts under the Transportation group (See Summary, pages 699-700) show charges to the Mineral Range passenger service for the same reason as explained under the Maintenance of Equipment account. The charges to the Mineral Range under this group are $14,522, leaving $332,208, which is charged to the plaintiff's passenger business, making my total passenger expenses for the Transportation group $25,607 less than Delf's, or $346,730. The major differences in the entire group are in the accounts, "Dispatching Trains," "Station Employees" and "Station Supplies & Expenses."

1607

Under the group, "Miscellaneous Operations," there is no difference between Mr. Delf and me.

Under "General Expenses," Mr. Delf and I have both divided the accounts as overhead to, or in the same ratio as, the preceeding groups, "I" to "VI." The difference between us, my figures being $3,646 less to passenger, is because my assignments to passenger in the preceeding groups are less.

My grand total of 1917 passenger expenses, including the Mineral Range, is $122.065, less than Delf. The results of the division of expenses for 1917 appear in the recapitulation at the bottom of page 701 of Defts.' Ex. 325, and the computations, divisions and alloca-

tions are correctly carried forward to the best of my ability. The methods used represent my judgment as an accountant.

Referring to the division of accounts for 1916, Defts.' Ex. 325, page 331, for 1915, page 161, and for 1914, page 3, the intention has been to divide each of these in the same manner as described for the year 1917. There are no differences in principle, though there may be some slight differences in the mechanics of setting it up. In 1914, there was a different I. C. C. classification, and we followed that. The I. C. C. numbering of the accounts was changed in 1915. The old Series of 1914 began at 1 and ran to 116, while in 1915 the first account is 201. Prior to 1916 there had not been such attempt at allocation on the part of the company as since, but the variations, if any, are as to minor things. I think that Superintendence under Traffic in each year should be made overhead in the interstate and intrastate division and a correction on that account made.

1608 For the years 1914, 1915 and 1916-1917, it was my purpose intent and endeavor to reach correct results.

The plaintiff's revenue for 1917 is treated in Defts.' Ex. 325, page 705. The amounts are, I think without exception, the same as Delf's Ex. 209, page 5, though I have observed the form of the revenue account and Delf has brought into his total some of the income accounts. We are in agreement in the items on page 705 of Defts.' Ex. 325. Delf's total of $1,064,800 would be produced by combining my items on pages 705, 709 and 710.

The items shown under sleepers and diners, mail and express and passengers and baggage are the same as Delf's, except I have carried those out into other columns. This is the outside revenue from business in excess of fares. There is no separation by the company of those fares derived from passengers carried in sleepers.

Delf has included in his total revenue the revenue from sleepers and diners, the same as I have before I divided. He has included the sleeper and diner expense in his total passenger expense. I then subdivide the expenses, charging to sleepers and diners the portion I say should be charged, and exclude it from the passengers and baggage proportion, while Delf, has not excluded that, but has kept them in his passenger business and has assigned them to interstate and intrastate. I have deducted from the revenues from passenger that portion of the revenue derived from sleepers and diners, to offset the revenue as far as it would go against the expense. I had deducted it before I made a division between interstate and intrastate, to determine the intrastate passenger expenses and revenues. On the other hand, Mr. Delf has included the sleepers and diners in the expenses and revenues and in his division between interstate and intrastate.

To show the amount set off to sleepers and diners, page 712
1609 of the exhibit shows the operating revenue of the sleepers and diners as $70,719, and expenses of the same as $233,223, which represents a deficiency of $162,504. There are two deductions in this income account, the first for the rental of sleepers and diners, an amount paid out by the company, and the second, a proportion of taxes. The net result is to charge the railway company with a loss of $179,867 on account of the operations of sleepers and

diners. If the sleepers and diners were included as a passenger operation, my net income would be reduced by that amount (subject to an adjustment of the revenues from those sources). To complete the comparison, you would have to restore this amount to interstate and intrastate in the proper proportion. The amount of total passenger income stated by me, on page 712 of the exhibit, as $553,480, would in this event have to be reduced by $179,867.

Plaintiff derives no revenue from the foreign sleepers. In my computation, I have attempted to separate the expenses of hauling the sleepers and take it out of the passengers and baggage expenses. In the matter of revenue, the plaintiff gets $15 a day for the round trip of the C. M. & St. P. trains over the line, Champion to Calumet, and 25 cents a mile for the run of the C. & N. W. With the C. & N. W. and C. M. & St. P. trains to Marquette and Calumet, in addition of those of the plaintiff, there is quite a piling up of trains, and it seems to me there are a good many trains running where a few would serve the purpose. Both of these other lines have a train each way with sleepers to Calumet, and there is a sleeper for each into and out of Marquette.

I have given the passengers and baggage business credit for the fares of passengers carried in sleepers, but have not charged that business with the expense of hauling the sleepers. In fact,
1610 I have charged sleeping car expense entirely by itself, and not into the passengers and baggage part. I have not taken into account but have eliminated the expense of hauling Pullman cars in the final result, to determine whether two cents a mile is sufficient rate. It has been my intention throughout to eliminate, as near as I could arrive at it, the cost because of the sleeper and diner services from the passengers and baggage business carried to earn two cents a mile.

Page 709 of Defts.' Ex. 325 is substantially the same as Mr. Delf's figures for the same items, the only differences being in the items representing rents received or paid for the hire of work equipment.

Page 710 is substantially the same as Mr. Delf's treatment of similar items, down to the first total, though from that point on I have credited a proportion of the passenger amount to the Mineral Range operations.

On page 711 of the exhibit, the item for taxes is temporary and will be revised as soon as I get the proper figures. I used the accrual basis for taxes from the reports. Mr. Delf first used that basis and has now changed to the actual tax. The result is that, from 1914 to 1917 inclusive, I have charged $15,146 more of taxes to passenger than Delf has.

Page 712 of the exhibit represents the totals carried forward. The last line of items across the sheet, "Net Corporate Income," correctly represents the balance upon my allocations to states and services. My final result is a net return for the intrastate passenger business of $394,469, subject to slight corrections for taxes, superintendence and a couple of other little errors.

The following sheets (Defs.' Exs. 325B, 325C and 325D)
1611 show groupings of the allocations or assignments by me on the various bases for the years 1914 to 1916.

THIS PAGE BOUND

1914, 1915, and 1916.

	1914.			1915.			1916.		
	Total Michigan.	Freight.	Passenger.	Total Michigan.	Freight.	Passenger.	Total Michigan.	Freight.	Passenger.
Accounts allocated	$59,957	$56,773	$3,184	$39,660	$39,134	$526	$62,869	$61,905	$964
Accounts assigned on equated track	81,410	80,457	953	56,167	55,525	644	61,690	51,096	594
Accounts assigned on time basis	107,891	80,346	27,545	90,565	65,089	25,476	127,418	95,737	31,681
Accounts assigned on gross ton miles	346,765	241,314	105,451	228,959	154,823	74,136	191,878	138,268	53,610
Accounts assigned on various bases	34,028	23,912	10,116	6,980	5,418	1,562	22,766	16,490	6,276
Accounts assigned overhead to others	26,247	19,820	6,427	22,514	16,596	5,918	25,172	19,610	5,562
Total	$656,298	$502,622	$153,676	$444,845	$336,583	$108,262	$481,793	$383,106	$98,687

1613 PARKER.

Cross-examination.

By Mr. Tracy:

The proper figure on page 712 of Defts.' Ex. 325, to compare with Delf's final result, may be obtained by subtracting the footings of the column "Mineral Range," from the following column, "Total." This would give $346,431 as compared with Delf's $212,467, shown on page 5 of Pltf.'s Ex. 209.

PARKER.

Further direct examination:

In the division of the passenger expenses between interstate and intrastate passenger, I differ from Mr. Delf only in that I have divided the accounts, 373, "Station Employees," and 376, "Station Supplies & Expenses," on the basis of passengers carried one mile, while Mr. Delf has used ticket sales.

On page 518 of Defts.' Ex. 325, for 1916, under "Interest-Cr.," in the item of $3,999, I have included $1,684 interest on the redemption fund, which should not have been done, and which should be excluded. This would reduce the column of total passenger. It is interest of the fund put aside to redeem the coupons issued to cover differences in the fares collected. It would make a difference of about $1,180 in intrastate.

The plaintiff's modified revenue train mile ratio, 1917, was 42 21 per cent passenger, the straight revenue train mile, 48.37% and the difference, 6.16%. The difference is due to the inclusion of switching mileage made on common track. The modification is not as great as if made by adding the entire switching to the revenue train miles. The first modified revenue train mile ratio in this case was presented by defendants. It was based on plaintiff's testimony showing that approximately 39% of the time of freight trains was engaged in stational or switching service at way terminals. The modification consisted of the assumption that 61 per cent of

1614 the time was represented by the running of trains, and, increasing that 61 percent to a hundred, the difference in miles was a constructive mileage or stational element, which should be added to the train miles. To that was then added the statistical switching in yards and a percentage of approximately 34 or 35 per cent passenger was produced. Plaintiff then suggested further modifications, being (*a*) a reduction of the 39% for a claimed 15% of idle time of locomotives in stational, (*b*) an adjustment to bring in omitted yard switching, (*c*) an adjustment to exclude time on exclusive freight tracks, and (*d*) a reduction to compute the stational element on the basis of six miles per hour. That was practically the ratio adopted by the Master, and was based on 39% of the time being stational. The Master's percentage was between 43 and

44% passenger. There is practically no difference between the Master's ratio and plaintiff's present ratio.

All switching time is now computed at six miles an hour, without excluding the first hour, as heretofore. Our tests, so far as I have been able to analyze, have shown that the stational time is above 39%. The tests were made to determine how much of the stational or switching was spent on exclusive tracks and how much on the common tracks; we are in substantial accord as to the percentage which relates to the switching movement.

The tests show that 56.94% of the switching or stational time while in movement was spent on common tracks. The 56.94% took no account of the use represented by the train standing on the common track for 97% of the time. The tests did develop that for about 97% of the time, while the switching operations were going on, the portion of the train not engaged in switching was left standing on the main tracks. While this was shown in the statistics, it was not carried into the computation of 56.94%.

1615 The necessity of determining the time spent on exclusive tracks is that the expense of maintenance of exclusive tracks has been taken out of the remaining common expenses, and in finding a factor to divide the remaining common expenses the elements should relate to the common trackage on which those common expenses occurred. In my figures, where I have used time or ton miles, I have reduced my factor of switching ton miles or time down to 56.94% and included that in my totals. The balance, being on exclusive track, is thrown aside.

The Mineral Range statistical passenger miles were included with those of plaintiff during 1912 and for three months of the fiscal year 1913 (to October 1, 1912). The change came under a contract of October, 1912, under which they operated their trains over the Mineral Range the same as now, except they paid it a track right privilege and retained the fares.

Defts.' Ex. 326 correctly sets forth the statistics and percentages shown on it, being the number of interstate and intrastate passenger miles. This shows a marked falling off of interstate passenger miles in 1915 as compared with previous years. In 1912 and 1913, the number of interstate passenger miles was approximately 11,500,000 each year, in 1914, 13,400,992, and in 1915, 12,757,022; in 1916, they dropped to 8,597,088, and since that time they have not reached ten million. I believe this falling off is entirely due to war conditions shutting off immigration and the return of foreign population to home countries. Before the war, plaintiff ran emmigrant trains.

In examining its statistics to 1913, I found many prepaid orders for tickets, it being the custom to that time for persons in this country desiring their freinds come across to this country to purchase

1616 prepaid orders, being orders for railroad and boat fare for persons desiring to come this way; there has been a marked falling off in this business in this period; in fact, it is now very small. I know of no other condition to which this marked falling off and continued low amount of interstate passenger miles

could be ascribed, unless it is being routed over the Soo Line, which also belongs to the Canadian Pacific. There was a falling off of over four millions, 1914 to 1915, in intrastate passenger miles. The year 1914 was testified to by Delf as having a great volume of business in the Copper Country, and I don't think that a fair year for comparison, they having had over a million passenger miles of soldiers.

I have, on Defts.' Ex. 326, computed a ratio for the proportion of intrastate passenger miles to the total, based on average statistics for five years. The exhibit shows computations and comparisons on the basis of the relations between the interstate and intrastate passenger miles having remained the same and the actual conditions through their having fallen off due to the facts testified to.

(The Court called attention to the fact that there was an apparently abnormal change in statistics of 1914. This led to the revision of the exhibit, which is again referred to later.)

Since 1910, there has, with the exception of 1914, been a gradual falling off of interstate traffic, down to the last year. Even for 1914 the aggregate is not as high for interstate as it was in 1910, and 1914 is less than 400,000 higher than for 1911. The 1915 interstate was about 24% below the average for the previous five years; while the 1915 intrastate was 2.5% below its average for the previous five years, if the Mineral Range mileage had been included in 1915, as in some years previous, there would probably have been no falling off in intrastate.

1617 The permissible interstate rate on this road, 1910 to 1917, has been constant, so that the increase in passengers cannot be attributed to change in rate. During this period, the rate actually charged intrastate passengers has remained constant.

PARKER.

Cross-examination.

By Mr. Tracy:

I began my work of analyzing plaintiff's accounts for 1914 to 1917 by going to Marquette, March 18, 1917, and remaining thereto to November 1. I was furnished access to all its books and records, and whatever material Delf had. I had two people helping me. Mr. Hillman was there, and he had a force varying from 10 down to five. We were furnished the statistical matter shown in Pltf.'s Exs. 202 to 205 the latter part of April. In April we were also furnished Delf's computations of operating expenses and revenues and operating results, 1914 to 1916.

While these statistics and computations were, in general, in the same form, the figures have been changed some. In general, in dividing plaintiff's expenses to find the proper amount attributed to the intrastate passenger traffic, I followed Mr. Thompson's methods. I would give substantially the same arguments and reasons as given by him.

The question of the use of common tracks in switching arose after Thompson's testimony; I have brought in the ton miles and time; I apply them to the division of the same accounts to which he applied them, without deviation. In assigning expenses of exclusive freight track, he used a three to one equation. I changed it to two to one. The $73,538 which I assign to exclusive freight tracks is assigned through the use of the equated track ratio. Other amounts were assigned overhead on the basis of those assignments and some were allocated. I don't think the total amount attributed by me
1618 to Maintenance of Exclusive Tracks would equal $91,000.

Page 527 of Defts.' Ex. 325 shows the time ratio. The adjustment made or compensation allowed to the freight trains for the amount of time they spent on passing tracks waiting for passenger trains, and vice versa, does not appear.

Thompson testified that in preparing his ratios he assumed 2.75% of the time of freight trains waiting for passenger trains. I did not use that same figure, but made independent study, and the factors were somewhat different. I found the passengers delayed the freights 1.68% and the freights delayed the passengers .025%. We are not necessarily in disagreement, as our computations relate to different periods. My computation on page 527 of Defts.' Ex. 325 shows passenger trains running about 24 miles per hour and freight trains at a little less than 10. The figure of 2.0227 for mixed trains should be 2.9227 minutes per mile.

By this time ratio, number 4, I measured certain items of expense, by comparing the amount of time passenger and freight trains spent between terminals. Assuming a passenger and a freight train both started from St. Ignace at the same time, and the passenger train went enough faster than the freight so it reached Marquette, turned around and went back to St. Ignace, completing the double trip over the road at the same time that the freight arrived in Marquette on its single trip, according to the time theory, the use of the common property by those trains would be the same. The passenger has had the same number of hours' use of the property that the freight train has. In common with Thompson, if in my opinion the cause of the majority of the expense was due to weather I applied the time ratio, and if it was due to wear I applied the gross ton mile ratio.
1619 Of account 373, page 627 of the Exhibit, I allocated $79,331 to freight and $11,413 to passenger, leaving $84,073 common, wheih I apportioned between passenger and freight on the relation of the allocated part. This was on the theory that you might expect the common work to have been rendered for the two services in the proportion of the allocations. The allocations were at the Soo, St. Ignace, Marquette, Negaunee, Ishpeming and Houghton. These are the larger points on the line, which are big enough to afford separate passenger and freight forces. It would follow that these proportions were established to divide the expenses of an agent at a point like Wetmore.

The passenger proportion of the station expenses at the Soo does not appear in the Station Employees account, but in the Joint Facilities account.

St. Ignace is a town of three or four thousand. It is a main transfer point on the line; freight has to be rebilled, and less-than-car load freight consolidated, and they have a large force; I don't know how many in the transfer portion or how many for the local freight.

Marquette is a main division point, and all freights into it are broken and made up again for sending out on the different divisions.

Ishpeming is the transfer point of the C. & N. W. A large part of their freight is rebilled, and carload freight consolidated, there; they maintain a transfer point and sheds there jointly.

At Houghton, there is a connection with the Mineral Range and the Copper Range.

There is a consolidation of freight at all these points, more or less, and rebilling and transferring, the same as done at
1620 Champion, Sidnaw and other points.

The expenses of the agent of the Marquette coal docks are kept in the Station Employees account.

"Q. So you have taken the allocated expenses at the Soo, where the allocated portion of the passenger is not at all representative of the total passenger expense; you have taken the allocated expenses at St. Ignace, where necessarily a large part of the freight expense must be due to the fact of it being a transfer point; and the expenses at Marquette, Ishpeming, and Houghton, where a large part of the freight expenses must necessarily occur, being a transfer point, and used that as a measure for determining the division of the expenses of the agent at Wetmore and Seney?

A. Not solely, there; I have used it for the division of expenses for every station, and that includes Wetmore, Munising, Junction, and every other terminal or exchange point—everything.

Q. And the result of that is that only about 12 per cent of the Wetmore agent's salary is assignable to passenger, is that it?

A. I should think that would be about a fair proposition for Wetmore too.

Q. Based upon those allocations which I have called your attention to?

A. Based upon my notion of it."

The taxes for 1917 are not yet levied. Upon the question of use for the fiscal year 1917 of taxes paid for 1915 rather than 1916, the tax rate in Michigan, in the odd year is generally higher than the preceding year. The efforts of the Tax Commission in equalizing property in the past few years has also disturbed the average
1621 rate, and, other things being equal, the 1917 tax might not be heavier than 1916. I have taken taxes on Delf's accruals, as shown by the books, and he has taken the estimated basis, with the result that my taxes for the four years are $15,000 more than his. I intend to change this.

As shown on page 712 of Defts.' Ex. 325, of the total passenger operating expenses, about 36% is assigned to sleepers and diners and 12% to mail and express. The amount to be assigned to those services would vary with the total passenger operating expenses. Delf's passenger operating expenses are larger than mine, and, subdividing his passenger operating expenses between sleepers and

diners, mail and express, and passengers and baggage, on my percentages, would attribute an even greater loss to sleeper and diner business. On his figures, by the use of his train mile ratio, about $43,000 more would be assigned to sleepers and diners than I assigned. If there is a loss, it would increase the loss. Mr. Delf's increased expense would increase the deficit and decrease the profits. In my assignment to sleepers and diners I assign a proportion of the haulage cost. I assign a proportional part of all expenses excepting the Traffic group, Station Employees and Station Supplies and Expenses. The result of my computation is to show that in 1917 plaintiff's sleeper and diner business was conducted at a loss of $179,867 (subject to adjustment for taxes), and a loss in 1914 of $199,141.

I don't advance the claim that the railroad should abandon that business, to save that amount of money. That is a proportional part of the passenger expenses. In regard to mail and express, I follow the same system, assigning a portion of Maintenance of Way and Structure expenses, superintendence, transportation, and items of that kind—in fact, of practically all accounts except the
1622 Traffic accounts and one or two others. My figures for 1917 show a mail and express loss of $8,616, subject to adjustment for taxes. I do not claim that you could save that by abandoning the business. That, with every other thing in the process of the division of accounts, has been put together on a proportional basis. Very little would be saved in the wages paid engineer, fireman, conductor or brakeman if the mail and express business were dropped out. There would be no saving in the upkeep of fences but station buildings would be a little different, as they are used for the storage of mail and express, and portions of them are occupied by the express companies. I cannot say as to the proportion to be saved by cutting off this business. There is a use of fuel and water for the tonnage moved, and other transportation accounts would be affected. I don't think the plaintiff has an exclusive mail and express car, though they have some in these foreign trains. The South Shore car is a baggage, mail and express car, with several compartments.

If they were starting business without the mail and express business, there would be no provision for them in the cars. Without this business, I think there would be a proportionate decrease in the weight, dimensions and expense of haulage. I don't think that you must treat the mail and express as a by product if you separate it. I don't believe I can answer that the mail and express is a by-product, on this road. The business is all interwoven, and I don't think I can say which one is the by-product of the other.

Now having the equipment, if the mail and express business were eliminated, the baggage car would not be reduced in weight, space and dimensions, but if they were getting new equipment to take its
1623 place it would very likely be reduced a certain percentage. We might put the baggage compartment in another car. The weight of the car wouldn't be reduced much if it carried only baggage. I assigned no part of the baggageman's wages to mail and express.

Page 330 of Defts.' Ex. 325, 1915, shows the total net return from freight as $198,437, and from passengers and baggage proportion $437,680. That comes in part from the freight operating expenses being higher than passenger and in part because the freight business dropped off in that year.

Page 160 of the exhibit, 1914, shows net freight return, $48,401. Page 516 shows net freight revenue for 1916 of $483,195.

The Master, in assignments which we contended attributed too much to passenger, assigned about one-third of the property to passenger business. In 1916, I show the freight and passenger net returns nearly the same, and for 1917 the freight return was considerably less than passenger, being somewhat due to increase in freight wages.

PARKER.

Redirect examination.

By Mr. Wykes:

If the entire passenger business were taken off the road, certain of the costs—e. g., maintaining structure would go on undiminished and unincreased if there was nothing but the present freight business.

I do not know which is the by-product of the other on this road—the passenger business or the freight business. I think my theory of making the assignment to services on the proportional basis in direct line with the rule in the West Virginia passenger rate case and the North Dakota coal rate case, and I have intended to carry out that rule. The proportional theory is carried out from start
1624 to finish, including the division between interstate and intrastate passenger business, on the ratio of passengers carried one mile. We treat the passenger in one service as being the equal of the passenger in the other, regardless of density of traffic, though increased volume in practically everything decreases the cost per unit.

If the proportional theory is abandoned in the separation of costs to mail and express and sleepers and diners, it should also be abandoned in the division between interstate and intrastate passengers upon the ratio of passengers one mile.

1625 C. A. PARKER, recalled.

Direct examination.

By Mr. Wykes:

Referring to Defts.' Ex. 325, ratio 1, gross ton miles on common track, appears on p. 521. I obtained the ratio and computed the tonnage as follows: The mileage of freight train cars was divided into classes with respect to whether foreign or domestic and whether loaded or empty, with further division or class of ore cars. Weights were determined from, daily weighings at the Marquette scales, those given in the several appraisals, and those given by the Master Car Builders and we depended on scale weights for the average weights of foreign

cars. These particular weights were applied to classes of cars in groups according to freight mileages in Michigan. The caption to ratio 1 is "Michigan Gross Ton Miles on Common Tracks." There is no tonnage in the columns "Total" or "Freight" which is not made on the common track. I obtained these statistics from the Company. My request when I first went to Marquette was for the ton miles of traffic on the common tracks on the main line. Delf modified some of the early ton mile statistics which he furnished me in two ways: first, by a change to convert long tons into short tons in the ore business and second by the elimination of ton miles not on common track. The computation from car miles into ton miles was made by myself from the statistical records of the car miles on plaintiff's tracks. I satisfied myself that the car miles included only those made on common track having a conference with Delf on the subject. I had had experience on the road in the past, in 1912-1913, I compiled similar data. Then we computed and made deduction from the ton miles in freight service on account of the ton miles of cars, locomotives and freight on exclusive track, as we did not wish to burden the common track and mileage with ton miles on ex-
1626 clusive tracks as we were setting off those expenses by an equated track ratio. During 1917 when computing for years 1914-1917 I started to do the same thing again, and after conference with Mr. Delf, comptroller and Mr. Kemp, Auditor, I decided there was no necessity for any further reduction and made this note in my memorandum on pages similar to my previous data, on the subject for 1912-1913 "No data computed for these pages as Delf data of traffic excludes ton miles made on the exclusive ore branches." This applies to the train load and that was the figure given me for this particular year.

The third item, locomotives. Those were computed individually. Each engine's total weight in working order plus tender with 60% of its rated capacity for fuel and water was taken. To this the Michigan mileages of movement were applied. The explanation with regard to my request for statistics applicable solely to common track applies to the mileage as well as to train loading. The basic figures were obtained from the Company. Our own investigations covered the tonnage and not the miles. We did not attempt to check up with mileage but my request was specific and thoroughly understood. Throughout the computation of ratio 1, I have attempted to include in it only the things indicated in the caption "Michigan gross ton miles on common tracks."

Defts.' Ex. 337 is a tabulation to reassign (for the purpose of meeting a possible theory), expenses set off to sleeper and diner business for 1917, to the respective inter and intrastate passenger and baggage business. The first five sheets are extensions or subdivisions of ratios appearing on Defts.' Ex. 325. My ratio 1*a*, Defts.' Ex. 325, p. 525, shows the Michigan passenger gross ton miles on common tracks for 1917. The total 98,186,235 ton miles under the caption
1627 "Sleepers and Diners" on p. 522, is distributed on sheet 1 on Defts.' Ex. 337 among the several sleeper routes and diners as appears from the captions. The Soo route ton miles is the miles

of Sleepers St. Ignace to the Soo times the average ton weight of sleepers. The C. M. & St. P. and C. & N. W. ton miles, includes the foreign sleepers west of Marquette and into the Copper Country. The ton miles of D. S. S. & A. sleepers is the mileage times the average weight. The foreign diner ton miles comprehends the foreign diners on C. & N. W. and C. M. & St. P. trains west of Marquette. The ton miles of D. S. S. & A. diners is the miles of diners of the company in Michigan. In each column is included the proportion of the locomotive weight and the distances travelled and below is a distribution of switching carried in to subdivide gross ton mile ratio 1-*a*. Sheet 2, Defts.' Ex. 337, divides the sleeper and diner tonnage 97,109,603, ton miles found in my ratio 1-*b* on Defendants' Ex. 325, p. 523, between the several sleeper and diner routes and services. The difference from sheet 1 is that sheet 2 excludes car ton miles in trains not handled with plaintiff's power or crews.

Sheet 3 treats of the sleeper and diner car miles shown in my ratio 3, Defts.' Ex. 325, p. 525, and classifies into routes as indicated by the caption. The first two sheets ratio 1, 1-*a*, and 1-*b*, are ton mile ratios and sheet 3, ratio 3, is a car mile ratio. I used these to apply the same ratios as were applied in Defts.' Ex. 325. Sheet 4, Defts.' Ex. 337, is a division of switching at the various yards according to the cars handled. The sheet 5, is a memorandum to indicate what accounts were made overhead throughout the calculations.

On Defts.' Ex. 325, p. 696, I had summarized maintenance of way and structures expenses for 1917, assigned to sleepers and
1628 diners as $40,619. The first large sheet of Ex: 337 takes the items forming this amount applies the ratios found for division among routes as indicated by the column headed "basis of subdivision" and separated the items making up the $40,619 to the several routes or services indicated by the captions. All the way down the page wherever a description is given as such a ratio description it refers back to one of the previous sheets and gives you the factor by which each of these columns is produced, with the possible exception of Accounts 231, 233 and 235. When in that column the word "overhead" is used, the basis of division can be obtained by going back to the preceding sheet marked "Overhead." This sheet will explain accounts 231, 233 and 235, the percentages also being there. The next sheet, maintenance of equipment group, shows the sleeper and diner expenses divided as indicated by the numbers shown in the column "Basis of Subdivision," which compares with the basis used in Defts.' Ex. 325, upon the percentages shown on the previous sheets. This sheet in the third column, makes "Adjustment to Mineral Range," made because in the first instance I charged no part of the sleeper and diner to the Mineral Range, while I now make this adjustment attributing to it an aggregate of $407 for accounts 317 and 318.

What I have said will cover groups 4, 6 and 7 and the recapitulation.

The grand total at the bottom in recapitulation (Defts.' Ex. 337) is the total of my recapitulation for sleepers and diners in Defts.' Ex. 325, p. 701, $233,223. Following the line across the sheet the

figures represent my adjustment for the Mineral Range and assignments to the several routes or services mentioned on the basis of ton miles, car miles and every factor which I used for like purpose in distributing the total amount in Ex. 325. These totals are carried forward into the next page under the subcaption "Operating
1629 Expenses" and are combined with items from p. 701 of Defts.' Ex. 325, e. g. the Mineral Range expenses of $18,954 are increased by the adjustment made to include its proportion of the sleeper and diner expenses. In the column headed D. S. S. & A. passenger, is the bringing together of items showing the total expenses of the Michigan passenger business, less the Mineral Range. The next column shows the mail and express $77,743. The various captions under "Sleepers" and "Diners" show the amounts of sleeper and diner expenses attributed to the various routes or services. On the lower half of the sheet is a "re-distribution." Under this re-distribution the sleeper expenses for the various routes are combined with the passengers and baggage expenses and are then separated to interstate and intrastate passenger, baggage and sleepers upon the ratios shown in the notes. The Soo route sleeper expenses are divided to inter and intrastate 88.64% intra, the foreign sleepers 14.05% intra and the D. S. S. & A. sleepers 33% intra.

My separation of the sleeper expenses into routes was for the purpose of getting the amounts to which to apply the appropriate factors of divisions between intrastate and interstate, those factors being shown in the notes at the bottom of the sheet. Those factors or percentages were the results of our analysis of the passenger miles in foreign and D. S. S. & A. Sleepers in conjunction with Delf's analysis. The percentage under Note (*a*) is derived from Defts.' Ex. 311, 88.64% being the percentage of passenger miles intrastate to the total riding in sleepers on the Soo route in 1917. The expense of Soo route sleepers was assigned between inter and intrastate upon that percentage intrastate.

The passenger miles in C. & N. W. and C. M. & St. P. sleepers for 1917 indicate a percentage derived on Ex. 311, of 14.05% intra-
state passenger miles to the total and that percentage was
1630 applies to separate the expenses of those sleepers to inter and intra. The percentage of passenger miles in coaches 77.34% intra was derived from Defts.' Ex. 313, and that percentage is applied to the division between inter and intrastate passenger of the common passenger and baggage expenses which I had previously divided on the ratio of passengers carried one mile, or 70.67% intra. I have now raised my percentage of intra passenger miles to 77.34%. That comes about by reference to Defts.' Ex. 313, by the fact that we have deducted the passenger miles made in sleepers from the total passenger miles in Michigan and the remainder produced a higher percentage intrastate. I have divided those expenses which relate to the train, not including sleepers, on the ratio of passengers riding in the train exclusive of sleepers. This is not exactly right because the baggage accom-odations are provided for everybody and if you knew how much the expenses of baggage are they should be divided on the basis of 70.67% to intra being the passengers carried

in your trains. In other words taking account of the fact that baggage expenses are in the $323,048 divided on the ratio of inter and intra passengers in coaches, 77.34% the ratio should be nearer the 70.34% intra as baggage facilities for persons riding in sleepers are in that. Generally speaking, on the basis of including the sleepers in passenger business, as I now do, the computation to divide the sleeper expenses between inter and intrastate is on the basis of the use of the sleepers by individual routes by the inter and intrastate passengers. In this I separate the sleeper expenses including a proportion of the locomotive from the balance of the train and then reassign this separate sleeper expense to inter and intra services each on the percentages shown on the individual route and have finally brought it into the totals of passenger, baggage and sleeper business, intrastate and interstate. The result of my computation is that a different proportion of expense is charged to inter and
1631 intrastate business than if the sleepers and passengers were not segregated from the balance of the train. The revenue of the Soo sleepers is divided on the ratio of 33% intra. The purpose was to divide the direct sleeper revenue as it was earned, and as Mr. Delf says it was earned 37.27% intra, that is about it. On the last sheet the items are combined with the income account. The diners in my treatment have not been changed by these computations. They are sub-divided into classes as foreign "and D. S. S. & A." but are not brought back into the passenger and baggage business and I have used no similar factors for dividing those between inter and intrastate. The revenue from the diners is allowed as an offset against the charges against diners. The revenues from the several services are exact and no charge has been made. The balances shown in Defts.' Ex. 337 are: Michigan passenger $378,475, D. S. S. & A. passenger $399,569, mail and express deficit $3,271, foreign diners deficit $55,775, passengers and baggage including those in sleepers $466,725. Additions are then made from the income accounts as shown on page 712 of Defts.' Ex. 325. I have put into intrastate 33% of the sleeper revenue; Delf says it should have been 37.27%. The losses on mail and express and diners are all set aside from my final result. They are not absorbed by the passenger and baggage business. The final $479,056 would have been about $411,929, if the passenger and baggage business had absorbed the mail, express and diner loss.

(Mr. Tracy states that plaintiff is willing to assume that Parker's ratios for ton miles on common track can be regarded as substantially correct. (The record shows the only objection to Hillman's ton miles is that he adds for company freight. Plaintiff claims that the first column in Hillman's factor 13, p. 218, Ex. 329 "all tracks" is correct and that there are no ton miles made on the road
1632 other than as shown in the first column.) (Mr. Hillman testified that the caption "all tracks" was an error and that that caption should appear below; just above the two items of switching. Plaintiff claims the caption correct because they insist there is no tonnage in addition to that shown in the first column and Hillman says there is additional tonnage which is made on exclusive

tracks. Hillman's and Parker's ratios are based upon the total of the second column and plaintiff is not attacking the ratio at all. The question of what is included under "all tracks" is merely to be used as the basis for an argument and the question is academic.)

Defts.' Ex. 337 is prepared upon the theory of letting the mail and express and diner services bear their own losses.

Defts.' Ex. 338, 1917, is prepared by me for the purpose of excluding from the passenger and baggage service that portion of the sleeper expenses attributable to the excess weight from the weight necessary to carry the same passengers in ordinary passenger equipment.

The third column of figures shows the actual ton miles of vehicle or car in the designated service per passenger per mile. There being for each passenger per mile .411 tons of baggage equipment moved, for each passenger in coaches 2.320 tons, for passengers in sleepers on Soo route, 6.083 tons, on C. & N. W. and C. M. & St. P. sleepers, 14.121 tons, on D. S. S. & A. sleepers 7.10 tons. The .411 times the intra passengers indicates 9,711,955 ton miles of baggage service chargeable to the intrastate passenger. The passenger miles in sleepers intrastate were computed and carried into the intrastate column at the average weight required for a coach passenger instead of at the weight of equipment actually carried for serving those passengers when riding in the sleepers on the various routes.

1633 The reduction in weight is caused by the fact that the coaches weigh less than the sleepers and that the loading of sleepers in number of passengers are very low as compared with the coaches. The passengers carried on the Soo route sleepers were a trifle less than 10 per car mile; in the other foreign sleepers, it averaged 5.04 and of that 5.04, .79% of 1 passenger per car mile was carried. The purpose of this exhibit is to show the effect if the passenger service is relieved of the burden of carrying the excess weight used in carrying the sleeper passengers. The figures in the last two columns show the tonnage of equipment required in carrying of passengers using the average weight of equipment required for passengers in coaches. The third from the last column headed "Excess of Sleepers" shows the excess ton miles used in 1917 in the carrying of passengers in sleepers. The weight of diners and of mail and express cars is shown; from the car ton miles, percentages for each service are computed being mail and express 14.06%, diners 12.46% excess om sleepers 18.16%, interstate passengers 16.23% intrastate passengers 39.09%. There is no change in the former item of traffic and no change in the former treatment of diners and observation cars. I have no factors applicable to the latter. The above was a re-distribution of ratio 1-*a*, distributing the car ton miles between the classes of service mentioned. The same process was followed with reference to ratios 1-*b*, 3 and 3-*a*, found on the second and third sheets of Defts.' Ex. 338, the notes given being self explanatory of the slight difference in treatment. The only constant item in any of these is the mail and express. The result is to exclude diners and mail and express from passenger service.

Sheet 4, "Switching in Yards" is an analysis of factors on p. 531 of Defts.' Ex. 325 and the items are here distributed on the basis of excess ton or car miles of sleeper or diner service. These subdivisions are switching applied to certain of the switch-
1634 ing and yard accounts being applied to the individual yard in each case.

The next four pages following the first four, apply the ratios or percentages to the different items of expenses separating to the service listed in the captions upon the percentages arrived at and shown on sheets 1-4.

The last page of the exhibit summarizes the expenses thus distributed, and the operating revenue and income account down to taxes. The last line shows the net result after taking out the additions and deductions shown on Defts.' Ex. 325, producing the figures which follow as being net corporate income applicable to taxes and to corporate use for dividends and interest. The figures in the first column are the same in Ex. 337 as is the case with all columns to "Excess of Sleepers." The $63,585 under column "Excess of Sleepers" does not enter into the division between inter and intra state passengers. The amount I divided between interstate and intrastate on this exhibit, 338, is $543,845, net corporate income as against $479,056, on Defts.' Ex. 325. In Ex. 338, I still have charged against the sleepers $64,831, and the difference betwen that amount and the amount in the $179,867 shown on Defts.' Ex. 325, p. 712, as sleeper has been assigned to or absorbed by interstate and intrastate passengers and baggage, while in Defts.' Ex. 337 the sleepers have been assigned into the interstate and intrastate traffic. A difference between this exhibit 338 and 337 in results is because here the baggage is absorbed and in Ex. 337 it is subject to the explanation there made. I have the distribution of taxes under way but have not distributed them so as to get a final net to apply to the property.

(The State's first claim is that sleepers and diners, mail and express should be treated as an outside service and excluded from
1635 the passenger service.)

Defendants' Ex. 326*a* refers to and modifies Defts.' Ex. 326, the question having arisen that the year 1914 being somewhat abnormal might prevent fair results.

The first (left) half of the sheet is a recapitulation and recomputation omitting the year 1914 from the average figures.

The right half of the sheet is a computation of passenger revenue requested by Mr. Tracy and should be applied in the same manner as the passenger miles on the left hand side of the page. This is mathematically accurate. I have not used the percentages on Defts.' Exs. 326 and 326*a* for anything in this case.

1636 C. A. PARKER recalled.

Direct examination.

By Mr. Wykes:

Defts.' Ex. 343 is a distribution of the 1914 Michigan property value to freight and passenger, and to interstate and intrastate passenger. The totals are taken from Defts.' Ex. 332. After inserting the allocations to freight, passenger and common services, the commonly used property in the first sub-total for the schedules listed, shown as $5,429,028, has been assigned to freight and passenger business on the basis of time (Ratio 4), for 1914, 25.60 per cent passenger. The results of that assignment are carried into the two columns, passenger and freight. The following schedules, 19*a*, 19*b*, 21, 22, 23 and 26, have been assigned individually on the basis indicated in the description at the end of the line for each item. From the sub-total immediately following this group of figures, all land items were deducted, though the deduction does not appear on the tabulation. I am speaking of the sub-total, $8,182,554, passenger $1,603,039, freight $6,579,515. Excluding the land items, the relation existing between the net figures is for the passenger proportion 21.19%, and that has been applied to the common portion of the schedules, 20, 21, 27, 29, 33, 38, 39 and 40. For schedules 30, "Locomotives," 31, "Passenger Train Cars," and 32, "Freight Train Cars," Hillman's apportionment, and for the last two items the direct allocations, are used.

The total following schedule 32, of $11,392,206, passenger $2,262,069, and freight $9,130,137, excluding land, produced the percentage of passenger, 21% and this is applied to the division of schedules 41 and 42.

The Grand total result of the Michigan valuation for 1914 is $11,674,751, $2,321,403, passenger, and $9,353,348 freight. The passenger item is divided to interstate and intrastate passenger
1637 on the ratio of passengers carried one mile in the respective services, the result being intrastate passenger equals 64.69%, equals $1,501,716.

Defts.' Exs. 344, 345 and 346 are separations of property for 1915, 1916 and 1917, respectively, and the description with reference to 1914, Ex. 343 is applicable to each of these years, the only difference being those caused by different percentages.

The figures which I put in relating to sleeper travel were the result of a careful analysis and special investigation of that travel, by counting conductors' card reports regarding every passenger mile and every passenger. It was made with the purpose of being accurate, and, while not rechecked, was carefully made. Our figures would come very closely to Mr. Delf's if we restored the mileage deducted as being made on the Mineral Range. I cannot understand why the Mineral Range mileage would not appear, even though there was some question about Mr. Delf's sleeper mileage. The statistics of D. S. S. & A. miles in those sleepers, are kept as to D. S. S. & A. operation and revenue.

We did not know of any discrepancy between our figures and Delf's when we left Marquette.

Defts.' Ex. 347 assembles the values and net corporate income from previous exhibits, adjusted for taxes in accordance with Delf's Ex. 210, and shows net returns upon the value of plaintiff's property, as follows:

Year.	Total Michigan.	Freight.	Passenger.	Passenger & baggage. Interstate.	Passenger & baggage. Intrastate.
	%	%	%	%	%
1914.....	3.83	0.48	18.02	22.98	26.60
1915.....	3.63	1.75	11.07	14.46	17.92
1916.....	7.19	6.00	14.72	19.84	20.47
1917.....	6.47	4.23	17.17	24.40	24.99

1638 I have deducted no assumed loss and have not taken into acount either of the exhibits in which I made special treatment of the sleeper business. This is based on Defts.' Ex. 325, making the correction indicated for taxes. The mail and express and sleepers and diners are excluded from the columns, passenger interstate and intrastate.

1639 GEORGE E. FISHER, a witness for defendants, produced before the Court, Nov. 28, 1917.

Direct examination.

By Mr. Groesbeck:

There were no engineering charges on locomotives purchased by the D. T. & I. and Toledo & Detroit Railroads in 1916. The freight charge would have to be added to the cost shown in the contracts.

1640 L. C. SMITH, a witness for defendants, produced before the Court, on Nov. 28, 1917.

Direct examination.

By Mr. Groesbeck:

I am Deputy Highway Commissioner of Michigan having held that office four and a half years and am familiar with the work and records of that department. It is a part of the duty of the department to build bridges, particularly in trunk line highways. I have investigated to determine the average price paid by the State for steel in the construction of bridges. The steel bridges built by the department vary from 50 to 150 foot span, and have been constructed all over the State. The average price for the fiscal year ending June 30, 1914, for structural steel in place and painted, was $3.20 per hundred, and for the year ending June 30, 1915, $3.70; for the year ending June 30, 1916, $4.94. The raise in price began at approximately the same time that war orders were placed in this country after the beginning of the European war. While our department

is building some steel bridges, we are in the main, changing to concrete because of the present inflated price of steel. In my opinion the cost of highway bridges fabricated and erected is slightly greater than railroad bridges as the highway bridges must be shipped by rail and then by wagons or trucks over country roads and the facilities for erecting highway bridges are not as modern or economical as those for railroad bridges. Railroad bridges run heavier as a rule and the fixed charges are therefore less per pound.

Cross-examination.

By Mr. Tracy:

I make my comparisons as a matter of opinion verified by consultation with men who sell bridges to us as well as to railroads. I would not say that their figures were based upon already constructed railroads. Figures of recent years would be for bridges in exist-
1641 ing railroads. I am acquainted with the country through which plaintiff's railroad runs. Considering the maintenance of traffic I think it will cost as much to install a bridge on this road now as to take it in by team haul, assuming the railroad to be built new. The cost to the department of steel purchased for the year ending June 30, 1917, in place, was approximately $6.50 a thousand.

1642 HAZEAL J. PAYNE, a witness for defendant produced before the Court, Nov. 28, 1917.

Direct examination.

By Mr. Groesbeck:

I live in Detroit and am a civil engineer. In September 1881, I went to work for the D. M. & M., my first work being the running of preliminary lines Marquette to Ishpeming and Negaunee for the Marquette and Western; at that time the line St. Ignace to Marquette was just being completed. The M. H. & O., was in operation from Marquette to L'Anse. Neither of the extensions Soo Junction to the Soo, or Nestoria to Duluth, were completed. I worked for the D. M. & M. during the fall and early winter of 1881 and during 1882 and 1883 was engaged by the Houghton & L'Anse and M. H. & O. on the construction L'Anse to Houghton. I was assistant engineer on the construction. In the fall of 1883-4 I was assistant engineer and engineer in the construction of the Marquette & Western from Marquette to Negaunee and Ishpeming.

In 1884 I became general engineer of the D. S. S. & A. continuing until in 1904. I know of the building of the L. S. & I. At that time Mr. Fitch was general manager and at first vice president and afterwards president of the D. S. S. & A. I was present at a meeting between Mr. Fitch and Mr. Mather of the Cleveland Cliffs Co. when the matter of the building of the L. S. & I. was discussed. After the Cleveland Cliffs Co. had made surveys and in about 1895 I was called into Mr. Fitch's office with a map of the Marquette Iron

Range when Mr. Mather was there. They discussed the proposed route of the L. S. & I. Mr. Mather said to Mr. Fitch, as I remember:

"Mr. Fitch, if we cannot make a contract with your company on the basis that I have proposed, we will build this railroad."

to which Mr. Fitch replied:

"Mather, you won't build that railroad, you cannot afford
1643 to, it is too expensive a proposition."

While I did not know the terms of the contract proposed, it related to ore charges. Mr. Fitch said several times that they were making the surveys as a bluff to get a term contract at a much reduced rate on iron ore.

I have never known of a railroad being built where the bridges were hauled across country by wagon. The usual method is to give the contractor time to put on his superstructure after the track reaches the bridge, often delaying track work a few days. The other method of building a road through a new country would be to build timber structures and carry the traffic on them until such times as the renewals were made necessary by age, wear and tear. If I were the engineer I would build my foundations ahead of the completed portion of the road as far as I could and hold track laying, or build temporary tracks over the bridges and carry my steel work to the site by rail in construction trains. For grading, through a place like Seney swamp for instance, the work would be carried on with a "drag line"; work of that character has been let within the last few years in county ditching for from 10¢ to 15¢ a yard. That would be a small portion of a line like plaintiff's. My experience has been that we could let the earth work on the basis of an earth classification for about 28¢. The allowance for hardpan would probably increase the cost 2¢ a yard. I think it could be done for that money at this time.

The plaintiff's road runs west through the Montreal Valley from 3 to 5 miles north of the Gogebic Iron Range and north of the towns of Bessemer, Ironwood, Hurley and a few other small locations. Further west Ashton lies about 11.5 miles away. If I were constructing new line through that country, I should locate for the local
business, of the Gogebic Iron Range, meaning particularly
1644 the freight business. The passenger business would cut some figure also. There would be considerably more local traffic along a line so located in Michigan than along the line as now located. I am at present employed by the Michigan Central Railroad.

Cross-examination.

By Mr. Eldredge:

Nestoria was the natural place for the plaintiff to start an extension west. The line had surveys and the branch track built into Bessemer at the time I went with it in 1889-1890 and I made surveys into Ironwood and Hurley. Whoever designed the road must have considered

the question of reaching the iron ore of the Gogebic Range. Its transportation would have involved going 12 miles over to Ashland or to have found some other lake port and built a line for the purpose of shipping the ore. When the plaintiff's road was built the Gogebic Range was already served by the Wisconsin Central and the Marquette & Lake Shore. I do not know what contracts these roads might have had on the Gogebic Range but if I was building a railroad I would attempt to get where the business was offered and take my chances on getting part of it. Passengers from the Gogebic Range could reach the plaintiff's railroad via Saxon over the Lake Shore, via Marengo over the Wisconsin Central. It might have been more than a question of engineering judgment to determine the location of the road. I have been doing contracting work other than railroad work for the past three or four years. There was a marked increase in the cost of labor in 1917. I think the average price of 30¢ for grading, including hardpan, would be about right for 1913-1916.

Redirect examination:

Spurs into the different mining sections of the Gogebic Range were not built when I left the South Shore road in 1904. Passen-
1645 gers from Ironwood and Hurley via Marengo and Saxon would have to travel an indirect course and many miles further than if this line went in there.

1646 ELDEN E. DADSON, a witness for defendants, produced before the Court.

Direct examination.

By Mr. Groesbeck:

I am a public accountant. I have made an examination of the reports of the Marquette, Houghton & Ontonagon, and Marquette & Western, Detroit, Mackinaw & Marquette, the Mackinaw & Marquette, & the Duluth, South Shore & Atlantic Railways to arrive at their investments and additions and betterments from 1872 to 1917 inclusive. Defts.' Ex. 319 is the result of my work. The total investment and additions and betterments for plaintiff's entire system, including Wisconsin, is about thirteen million dollars.

Plaintiff's report for June 30, 1917, shows approximately forty-eight million dollars in road and equipment, less about $900 set up for depreciation; against this investment, we have found items of obvious inflation amounting to $34,424,235.47. This is shown in the exhibit in three items, pages 8, 10 and 12, and is items charged to road and equipment account which are not properly chargeable. Page 3 of Defts.' Ex. 319 is a summary of operating revenues, expenditures and net income from operation, as shown by reports to Railroad Commission from 1872 to 1917 inclusive. Page 3 shows the reported net income from operations at $25,822,248.95.

Page 4 shows items reported as miscellaneous additions to income account of $1,385,191.35.

Page 5 shows the reported miscellaneous deductions from income account of $1,294,275.99.

Page 6 summarizes pages 4 and 5, and shows a total income of $27,207,440.30. This page shows the disposition of those earnings, leaving a deficit, as per balance sheet of June 30, 1917, of $6,532,151.66.

1647 Pages 7 and 8 list various items of obvious inflation reported by the M. H. & O. page 9 showing how the first of those items is calculated.

Page 10 shows inflations from the reports of the D. M. & M. By inflations, I mean charges to road and equipment where no money or equivalent value has been expended.

Pages 13 and 14 show, on the left hand, a computation based on the net admissible assets of the railroads, and on the right hand a computation based on the net value of the road and equipment after deducting inflations. We show the fair income from the remaining or true values calculated at the rates of interest the roads were currently paying during the years represented.

On page 14, at the right, it will be seen that the total return on investment of road and equipment for the entire system, from 1872 to 1917 inclusive, calculated at the current interest rates, aggregates $21,043,902.74. Calculated upon the net assets shown on the left hand of the income, at the same rate, shows $17,195,243.30. Dividends are shown in the disposition of earnings and surplus, on page 6, and aggregated $1,330,039.74. Allowing interest at the rates payable on their securities, upon the investment as I find it from year to year, they would have distributed $21,043,902.74 instead of approximately thirty one million, which they did distribute, which would leave the surplus, June 30, 1917, about four million dollars.

Some of the most obvious inflations are the following: Page 8 shows bonds sold to build the road from Houghton to L'Anse, at a 50% discount, with the aggregate discount of $464,037.90 charged to road account; page 7 shows a deficit on the books of the company, as reported to 1878, of $562,824.66, which is charged to road account and thus taken from the books as a deficit; page 11 shows the ex-

1648 pense of refunding the D. S. S. & A. debt, discount, etc., in 1892, to be charged to property account in the amount of $4,833,108.21;

Item 1, page 11, is based upon the fact that when the D. S. S. & A. organized, their first report, in 1887, showed road and equipment aggregating over twenty-six millions. The only road the records showed to have existed in fact was the old D. M. & M., and later the M. & M. which was bought in at Receiver's sale for approximately one million dollars ($1,010,000), and an extension of 47 miles, Soo Junction to Soo. Data obtained from the I. C. C. records at Chicago showed stock issued to promoters of the Wisconsin, Sault Ste. Marie and Mackinaw Railway of $5,820,000, and to promoters of the Duluth, Superior & Michigan Railway of $5,700,000, a total of $11,520,000. As we find no evidence of these roads being in existence

we have no reason to believe any road mileage was given for this stock. The road mileage reported by the D. S. S. & A. in the same year coincides with the mileage, St. Ignace to Marquette, plus that from Soo Jct. to Soo, or about 197 miles. We believe no road was represented by the stock issued for these items, though stock was issued and a sufficient amount added to road and equipment account to balance the ledger.

The D. S. S. & A. report for 1890 shows for the first time, first consolidated gold 4½% bonds, of $11,143,300. These were shown as being in the treasury this year and the next. In 1892, they had disappeared, and the road and equipment account, which had been shown at $28,268,918, increased to $42,093,666. I did not find where any money or property had gone into the D. S. S. & A. for that bond issue.

The D. S. S. & A. had been holding the M. H. & O. under lease, and this year they claimed to have acquired title. In 1891,
1649 they had been carrying the M. H. & O. as an investment at $6,980,532, and the M. & M. at $1,400,000. These ceased to be carried as an investment in 1897, accounting for about $8,300,000. The first consolidated 4% bonds were shown of June 30, 1917, as $15,107,000. We were not able from the reports to trace any of the proceeds of this issue into the road.

In calculating the investment in the latter years, when a depreciation reserve is shown, we deducted the amount of the depreciation reserve shown from the property values shown by the reports of the Company. The only depreciation we have allowed is that shown on their books. In making up the investment account, it was not always possible to find the actual amount the railroad claimed to have expended in building and equipping the property; it frequently happened that the accounts shown in the table of additions to plant accounts did not agree with the increase in the plant accounts themselves. We gave them credit for all the additions and betterments reported to the Railroad Commission that we were able to find; for instance, in the D. M. & M. report for 1881, we used the cost of construction and equipment, at a total of $2,528,963.62, shown on page 9, while the amount shown in the balance sheet was $12,041,892.01, treating the difference, or $9,512,928.39 as an inflation.

In the main, we accepted items of cost as reported. In cases where they were obviously overstated, we made calculations; e. g., in the case of the M. H. & O., item 1, shown on page 7, Defts.' Ex. 319, the report for 1873 states the road value at $7,088,148.64 and equipment at $1,077,421.26. As the road consisted of 84.34 miles, this seemed extremely high, and we made some calculations based upon Riggs'
appraisal of 1911. As a result of a computation based on
1650 $18,800 a mile, we deducted $5,500,000, leaving the value at $1,500,000 plus.

(Discussion and objection by plaintiff's counsel to the admissibility of proof of original cost at this time.)

Defts.' Ex. 319 is based upon the various reports of the plaintiff and its constituent companies to state authorities. I have attempted

to analyze and digest them and deduct such items as I deemed unwarranted, calling them inflations. On page 14, the first column shows the year of report, the second column, the name of railroad reported, third column, net assets less commercial liabilities and deductions—i. e., the net assets less operating and incidental liabilities. I consider bonded debt a capital liability. From that balance I deducted the inflation. Taking the year 1917, the value reported by the company, less current liabilities, less what I claim are inflated values, shows a net value of assets of $6,192,609.41.

In the next column, the result is arrived at by computing interest on amount of return upon the investment. The rate of 4.5% is taken because that is the average that the company is paying currently on bonded obligations. I thus arrive at the sum of $278,667.42 as the amount of return computed upon the value of the assets at 4.5%. On the right-hand side, the computation is made in the same manner, but basing it upon the net value of the road and equipment accounts, disregarding other assets and liabilities and deducting the same inflations, and I there find that the net value of the road and equipment would be $13,375,591.85, and that 4.5% on that would yield a return of $601,901.68. The column headed "Amount of Return" is arrived at from prior computations, taking 4.5% on the value of the property; the returns in earlier years were calculated at different
1651 rates, based upon the average paid in those years on the bonded indebtedness.

The method adopted by me in arriving at the cost as a basis for my computations with reference to the Riggs appraisal was: The value of road and equipment, as shown in the trial balance of M. H. & O., as per their report of 1873, which was the first report in which they showed that, seemed very high, and, in conjunction with Mr. Hillman, we made some calculations based on the Riggs appraisal of the D. M. & M. and of the M. H. & O., from Marquette to Houghton. We determined the ratio of cost of roadbed grading on those two lines, as shown by the Riggs appraisal, and discovered that the costs so shown on the M. H. & O. (portion of plaintiff's) lines was 77% higher than the costs on the D. M. & M. lines. Having before the cost of the D. M. & M. roadbed as shown in their report, detailed in their report of 1881, we added 77% to the mile cost as a cost of roadbed on the M. H. & O. as existing in 1873, on the theory that if the Riggs appraisal placed it at 77% higher than the other in 1913, that presumably the cost when built was approximately 77% higher than the cost of the other line for which we had the figures as reported by the road. With regard to the cost of bridges, by a similar calculation we found that the Riggs appraisal placed the per mile cost of bridges on the M. H. & O. lines at approximately 50% higher than that on the D. M. & M. lines, and having the reported cost of the bridges on the D. M. & M. lines as shown and detailed in their report of 1881, we added a mileage cost of 50% to that in arriving at the cost of bridges on the M. H. & O. That covers the method by which we arrived at the figure we have used as the cost of the road.

With regard to the cost of the equipment which we have
1652 shown in this exhibit, on page 7, item one, the detail of that was provided us by Mr. Hillman, though I checked some of it

with him, with the Riggs report and the other reports, and the detail of the calculated cost of this equipment is shown on page 9 of this exhibit. For instance, with regard to the 30 locomotives, in the Riggs valuation of 1913, he states the reproduction cost of the oldest locomotives on the line at that time, consisting of seven locomotives built in 1882, at an average cost, or cost each of $6,916. We therefore used a figure of approximately $7,000 on the thirty locomotives which were reported to be in existence in 1873.

With regard to the next item, five passenger cars, shown at $13,-300; we found in the report of the road one new passenger car in 1876 and was extended out to cost $2,736, and the five passenger cars are calculated on approximately that basis. The three baggage and smoking cars are based on a value per Riggs' exhibits, 1911, in which he shows cars number- 40, 42 and 43 at $2,500 each, the oldest cars shown by him in that report, and we used those figures in calculating this price.

In the Riggs appraisal, as shown in 1911 report, he shows the three oldest passenger cars in existence, numbers 40, 42 and 43, built after 1873, at $2,500 each.

My understanding of those figures was that they were reproduction in 1911, though I am not very conversant with the Riggs method of valuation. And as to those cars (although I do not remember the year in which they were built, yet I do remember it was later than 1873) we concluded that that was at least a liberal price at which to value the three cars that existed in 1873. The same method was followed with regard to the 28 box freight cars, the 72 platform cars, the 476 flat ore cars and the 3 section cars. With re-
1653 gard to the Harper cars shown, 1122 Harper ore cars, we found in some of the annual reports a price of approximately $240 each on some of those cars and we used that figure. That, I think, covers the items in the schedule.

As to the locomotives and passenger, baggage and smoking cars, to produce the value for 1873, we took Riggs' estimate of the cost of reproduction new in 1911 of the oldest locomotives he found on the line. We made no investigation of whether it would have cost more to build the car in 1873 or of the effect of the panic in 1873.

This total valuation is supposed to represent the actual cost at the time, as nearly as we could calculate it from the data at hand.

Cross-examination.

By Mr. Eldredge:

The operating revenues shown on page 3 of Defts.' Ex. 319 for the M. H. & O. from 1872 to 1887 at $12,000,000+ are as reported by the company. I made no adjustment of those. The information was taken from the reports of the company to the Railroad Commissioner and Railroad Commission. That is true of all the compilations I have made. The operating expenditures are also as reported by the company. We made an analysis of the miscellaneous additions to and deductions from income account, as shown on pages 4 and 5

of Defts.' Ex. 319. The taxes were taken as reported, except for 1872 and 1873, where we applied the same amount as shown for 1874.

We accepted the operating revenue, expenditures and income as shown for the Marquette & Western, as reported. Our purpose with respect to the income was to make a comparison of the actual income as reported with what seemed to be a fair income or return on capital investment, as shown on the final table of the exhibit.

1654 Apparently, the M. & W. for 1884, was operating at less than 50% of expenses to revenue. We did not go beyond the reports, or study whether they had maintained the road properly or whether there were omissions of proper charges in operating income. The D. M. & M. was operated but one year (1886) as the M. & M. The operating revenue for 151.9 miles of line was $68,000, operating expenses $47,000, and operating income $21,000. We had no information to determine whether the report was accurate or not and included all the items of expenditure, but took them as reported. The item on page 4, Ex. 319, "Balance left over for construction in 1883," appears in the inflation table as item 2 on page 10. The report for 1883 shows increases in property account, road and equipment, $279,468.48, and an increase of $250,000 not accounted for. We do find that this increase of $250,000 is offset by items referred to as miscellaneous additions to income account. This is our analysis of the report. We included this $250,000 as a part of the inflation we found. The item, page 4, "Received from the Land Department, Trustee, 1883, $23,625.20," we treat as a part of the income of the road, and it is included, not as operating income, but as an addition to income.

The return shown on page 14, Defts.' Ex. 319, is not a statement of return as reported by the railway company. The $21,043,902.74 shown on page 14 is what we calculate is a fair return on the investment in road and equipment, after deducting inflations, at 4.5% interest, or other rates which were currently paid on funded debt. In earlier years, they paid higher rates of interest. We did not go back of the reports beginning with 1872.

I was trying to find out the amount actually invested in the property. I thought it a fair way to take the estimated value in
1655 1871, without reference to time of construction. It did not enter my mind that it was impossible to do what I was attempting to do with the data at hand. The plan was devised mutually between Mr. Hillman and myself. The item of about $8,000,000 seemed excessive for 84+ miles, and we made comparisons with the appraisals.

I did not learn that the M. H. & O. to L'Anse was built to earn a land grant. There was a sale of approximately two and a half million dollars of lands at one time. It is shown in item 4, page 7. We observed the book value assets were not decreased, although this land was evidently disposed of; we found that they had decreased their liabilities by applying $2,000,500 to the payment of mortgage debts. It would not necessarily follow that it decreased the assets used in public service. It would not decrease them at all. It might have been a good proposition for the M. H. & O. to sell those lands at that

time, though they did not get the market prices that might prevail in later years. I had the justification for the insinuation that the assets were stated greater than they should be, in that the road showed certain assets on the balance sheet, and having disposed of some of them they showed no decrease. They already showed decrease of liabilities, though the disposal of the property for liquidation of liabilities would not necessarily make any difference in the net worth of a corporation, but it should show a difference in the total assets, which, in this case, it did not. Referring to discount on Houghton and L'Anse bonds, item 6, page 8, while it might under certain circumstances be a justifiable proposition to sell the bonds at 50¢ on the dollar, it is not proper to charge a discount of that kind to property account. Discount on bonds is usually amortized during the
1656 life of the bond as a charge against the operations of the years during which the bonds live, and is not properly chargeable to property account.

I treat the discount as an inflation because it is charged to property account improperly, while it is an expense item which should be absorbed during the life of the bonds.

The reports with regard to land sales, the information was very meagre, and all the information that we could obtain from them was that lands were sold at different times for a certain net amount of money. It seemed that in taking credit for those sales the charges for taxes and other legitimate charges against the lands were deducted and the net amount shown in the reports.

In our analysis of miscellaneous additions to and deductions from income account we included all items reported as additions to or deductions from income. We obtained this information from the reports themselves. The items of inflation were obtained from a study of the reports.

We obtained some information from Mr. Hillman; that which refers to the first item on page 7, the value of the M. H. & O. as shown in 1873. When I referred this item of the valuation to Mr. Hillman, he directed my attention to these appraisals and assisted us to find a ratio that seemed to establish a fair price for the road, as shown on page 9. The only information as to the fifteen odd million dollars of bonds issued to the Canadian Pacific, and the 4% bonds of the plaintiff, was that they were shown as outstanding in the annual reports at the end of each year.

I now know the plaintiff to be the owner of the M. H. & O. There is nothing in the investment of the plaintiff that represents the cost to it of the M. H. & O. The report of plaintiff shows a value of road and equipment and their ownership of the M. H. & O. 1887 to
1657 1880, as an investment, and the acquisition of the title in 1891, and in the next report they show an addition of about $14,000,000 to road and equipment accounts. It was our duty, as far as possible to find what the M. H. & O. investment was, but there was no data given us in the reports to show that, and we never went outside the reports.

I presume that upon a letter from the Attorney General the plaintiff's officials would have given me access to their books, but I was not

so advised. We made no investigation to determine what plaintiff paid for other railroads it acquired. The only thing we were able to do from the data at hand was to determine, as far as possible, how the values were made up. When the plaintiff was organized, it issued capital stock of $22,000,000, showing $325,000 of equipment and the rest in road account; of that $22,000,000, we know about $12,000,000 was issued to the promoters of the consolidated roads.

I am not an engineer, but I feel bound to use good business judgment as to fair accounts. In making up accounts, we do not accept figures regardless of how absurd they may seem.

The roads taken into consolidation showed no good will account or anything of that kind, and, of course, we were not called upon to investigate it.

Pages 13 and 14 of Defts.' Ex. 319 show a decrease in net assets to approximately $6,000,000 in 1917, and an increase in net value of road and equipment to approximately $13,000,000 in 1917, the decrease being caused almost wholly by continual book losses showing a decreasing net worth.

As shown by their books, the company was losing money all the time. The fairer deduction, and the most liberal one to the railway, is on the right hand side of the page, where we show an allowance of

1658 an income equivalent to the income on bonds on their investment in road and equipment. This is the computed income mathematically fixed by me. These figures are all based on the figures presented by the railway company itself, deducting only those items considered obvious inflations, and the investors then allowed on a fair basis the rate that the bonds paid, and if they obtained that rate on the investment they would have obtained, 1872 to 1917, $21,000,000 plus.

We considered that would be a fair return. If the road was worth $10,000,000, bonded for the same amount, it would belong to the bondholders, practically. It would be clear the stockholders had no investment in it, regardless of whether they paid more for it or not.

The purpose of Defts.' Ex. 319 is twofold, first, to refute the claim that there is a deficit of $6,500,000 in the operations of this road, and second, to show the value of investment in road and equipment. The sole purpose of computing the interest or amount of return is as bearing upon the deficit.

1659 CLEMENT C. WILLIAMS, a witness for defendants, produced before the Court, Nov. 1917.

Direct examination.

By Mr. Groesbeck:

I am and have been connected with the University of Kansas, as professor of railway engineering, for four years. Previously, I was assistant professor and later professor of Civil engineering at the University of Colorado. I have had actual experience in engineering work connected with railroads for about six years, with the Delaware, Lackawanna & Western, the Chicago, Milkaukee & St. Paul, and the

Illinois Central, in the engineering department. I am a graduate in civil engineering of the University of Illinois.

I have done research work pertaining to the problems relative to track maintenance in connection with my work at the University of Colorado, and more particularly in connection with my work at the University of Kansas; that has extended over a period of about four years.

My attention was first called to the matter of stresses in track, and the effect of traffic on track, by observing some broken angle bars lying alongside of the Colorado & Southern Railroad, and I took those into the laboratory and made a careful examination and observed they were fatigue failures; the steel had failed by fatigue rather than by being over-stressed; that is, rather than by stress beyond the ultimate strength of the material. I made a further investigation of the subject in which we put a scientific apparatus on the track and measured the deflections of the track under traffic; the stresses in the rail due to the presence of traffic. For the purpose of measuring the deflections of track under traffic, we devised a Traffic Deflectograph.

1660 (Question raised by counsel of the right of defendants to produce proof of the effect of traffic on track at this point in the case, it being claimed that additional proof could not be put in. The proof was admitted as applying to the division of accounts 1914-1917 inclusive and as applicable to theories previously or subsequently advanced.)

My work in of research was not connected in any way with any issue or trial between railroads; it was carried on as a scientific research in connection with scientific studies of the University, purely for the purpose of furthering the knowledge of track maintenance,—the science of railway engineering.

The first piece of equipment that we used, as we call it, the track deflectograph, was a device we constructed at the University for measuring the deflection of the track under the passage of trains. It consisted of a framework of pipe anchored entirely outside the roadbed, to which were attached four cylinders, which could be rotated and which carried sheets of paper on which a record was made. A pointer attached to the rail made a mark on the upper part of this paper chart as the rail was deflected, recording exactly to scale the deflection of the track. At the bottom of the chart was a secondary pointer which indicated by means of electric contact the position of the wheel with reference to the diagram that was being made at the top, so that it was possible to relate or connect up the diagram that was made by the deflection of the track with the position of the train wheels at any time. That gave qualitative results largely rather than quantitative.

The second piece of equipment we used is a commercial equipment called the Berry Strain Gauge. It is used generally by all of the scientific laboratories throughout the country, Universities and other places, for measuring stresses in any piece of material
1661 when it is under load. This is attached to the flange of the rail and enables one to read the stretch or the deformation of

the rail exactly. The two pointers at the bottom of this equipment are inserted in small holes in the flange of the rail and 8 inches apart, and a dial which is about the size of the face of a large watch, has recorded on it by the pointer there the amount of stretch of the rail in that 8 inches, and from that stretch or deformation it is possible very simply to calculate the stress in the rail, because a steel rail is a piece of elastic material and it is possible very simply to calculate the stresses in such materials. This piece of equipment was used for getting what I might call quantitative results, that is, actual stresses in pounds per square inch in figures.

Most of the observations were made on the Santa Fe Railroad, near Lawrence. A number were made on the Union Pacific, a few on the Missouri Pacific, and quite a number on the Interurban Railroad, the Kansas City, Kaw Valley and Western. We took these latter observations for the purpose of finding behavior of the track under trains which were not pulled by a locomotive, that is, under the cars themselves.

I supervised and was present at practically all of those investigations and tests; all of the blue prints are contained in Defts.' Ex. 320, lettered from A to Q, omitting J.

Sheet A is a chart taken by the deflectograph and shows the deformation, the depression of the track under a passenger train, which was operated over the apparatus at 40 miles per hour. There are four charts on the sheet and each one of these was taken
1662 by one of these cylinders that I spoke of, which was located at the middle of the rail; gauge number 4, near the joint and gauges 2 and 3 were at the intermediate points on the rail; so that the record is the entire half of the rail as the train passed over it. The dots down below indicate the position of the wheels and I have interpreted the mean of those dots by sketching in conventionally the wheels above.

Charts B, C, and D are similar in general purport, although somewhat differently drawn up, inasmuch as the interpretation of the wheels is not shown, but from these charts which represent passenger trains operated at various speeds I drew the conclusion that the deflection was not increased under trains operated at higher speed. The deflection or depression of the track was not increased by virtue of the greater sped of the trains. The speeds are indicated on the chart, varying from 25 to 52 miles per hour.

Chart E is taken by the same apparatus, but under freight trains. It shows particularly an interesting observation, and that is that here is a tremor in the track under freight trains that does not exist under passenger trains. This is probably due to the eccentricity of cast wheels as distinguished from turned steel wheels, as will be shown by a chart later in the exhibit. That is shown by the very small waves in the line. The major waves or vertical movements of the chart indicate the general depression of the track, whereas in addition to that general depression of the track there is secondary tremor in the track due to a vibration apparently, and that is indicated by the small vibrations, or the small waves, we might call them.

On Chart F, I have scaled off the actual deformations from these

preceding charts and from others, of which these are typical, and platted these deformations against speed and those show what
1663 I stated awhile ago to be true, that the deformation is not increased by virtue of speed under the same twpe of equipment. The speeds of freight trains are nowhere here shown.

Chart F refers only to passenger cars of the same type; not to the locomotive at all. Chart G is platted in a similar way to chart F, but refers to the depression of the track under the locomotive, scaled under the chart, made by the rear driver of the locomotive, and the trailer. The trailer is, as well known, the wheel following the drivers and supports a load practically the same as the drivers, but it is merely a supporting wheel, not used for driving the locomotive.

The upper figure in chart G is one type of locomotive; the Pacific or Sante Fe type, 3500 class, all of the same weight of locomotive; and the lower figure on chart G refers to the 1400 class, or Atlantic type of engine, all of the same class.

Chart G shows, incidentally, the difference in deflection under the driving wheel and under the trailer.

The scale of deflection in inches is indicated at the left. In the upper figure the deflection of the trailer is twenty-five hundredths of an inch from the normal position of the track; the track is pressed down twenty-five hundredths, or ¼ of an inch under the trailer and a little more than that under the driver. The figures, .300 and .200, at the left, merely indicate the scale of the chart. The distance between the 200 and the 300 represents just one-tenth of an inch. The position of the top rail if there were no weight upon it, is not indicated for the upper chart nor for the lower chart, it would be somewhere below the bottom of the sheet.

The actual deflection is indicated, the amount being in-
1664 dicated at the left in figures, that is in the upper chart the deflection of the trailer is uniformly twenty-five hundredths of an inch. It is half way between two tenths of an inch and three tenths of an inch, or a quarter of an inch. The reference line is not shown on the chart, but the amount of deflection is shown at the left in figures and it is drawn to scale, and the same is true with the lower chart, the deflection of the trailer, uniformly twenty-two hundredths of an inch, does not vary with the speed, the actual amount of deflection being shown at the left margin of the diagram, of the coordinate.

Those figures at the extreme left show the scale of the diagram and aid you in measuring the deflections shown on the diagram.

Chart H represents the stresses obtained by the Berry Strain Guage, the second piece of apparatus which I described, and these are actual stresses under passenger traffic operated at various speeds. It is shown there that the stress does not increase with the speed.

As a matter of fact the observations that are there platted which constituted all that I had of that series, really show a decrease in the stress due to speed, but I have indicated there in a broken line, a dotted line, what the probable average curve would be if more observations had been taken. It will be observed that at 60 miles an hour and at 40 miles an hour there was only one observation taken. If

more had been taken I should have expected them to be distributed somewhat as they are at the lower speeds, which would make the curve more nearly horizontal, as will be shown in another curve that I have here. When I say stress, I mean the actual strain in pounds per square inch. In this case, it was exerted horizon-
1665 tally, the pull on the bottom of the rail, tending to rupture the rail in tension by pulling it apart at the bottom.

Chart H literally interpreted, would show a decrease in stress with an increase in speed. That fact is not in harmony with other observations that we have taken, and so I drew a horizontal line, labeling it the probable average curve, if more observations had been taken, because our other observations did not show a decrease in the stress; neither did they show an increase in the stress, although this particular set does show an increase (Decrease) but I think it is due to the fact that we have so few observations in this series around 60 miles an hour. If there had been more at that speed, they would have been scattered, probably, and would have raised that end of the curve.

Chart I represents a similar graph or plat of stresses under electric interurban cars, all of the same type. I made arrangements with the general manager of this interurban railroad to operate the cars over our apparatus at various speeds, as we should indicate to the motorman, and we found in this case also that the stress in the rail did not increase in a general way with the speed, the speed apparently having practically no influence on the stress. These points are scattered, as one might expect, because the exact stress depends on the lurch of the car as it happens to pass the equipment, but the average curve does not show an increase in stress with the speed. I have other charts here, showing records of other experimenters, made independently for other purposes, which corroborate the conclusions that I drew from the test that I made myself. The remainder of these charts represent the results of these other experimenters.

Chart K is a record made by the Committee on Iron and Steel Structures of the American Railway Engineering Association, an association of engineers, and represents a part of the results
1666 of a very extended series of experiments. The lower chart in particular is more easily understood in this, because it brings out the point more distinctly. In order to explain this, it is necessary to say a word about the counter-balancing of locomotives. In explanation: a freight locomotive is counter-balanced for the speed at which freight trains operate; a passenger locomotive is counter-balanced for the higher speeds, that is, for the speeds at which passenger trains are supposed to operate. It will be observed from the chart, with this in mind, that the passenger locomotive does not cause a large increase in the stress in the rail until a certain speed has been passed, approximately that speed for which the engine was counter-balanced, but that the speed for the freight locomotive causes an increase in stress because the freight locomotive was counter-balanced for a lower speed; as a matter of fact, under 58 miles an hour in this case, the increase in stress due to speed, that is, due to

impact, was the same under the passenger locomotive as under the freight locomotive at 20 miles an hour, and that conclusion was made by the Committee and can be found in the proceedings. They arrived at that same conclusion.

Chart L represents the effect of impact due to counter-balance on locomotives that are counter-balanced for passenger train speed that are well adjusted for operating at passenger train speeds, and they show that under about 48 miles an hour for steam locomotives the effect of impact did not exceed in any case here about 8%. They illustrate the fact that the increase of stress under the locomotive is due to improperly adjusted counter-balance, and that is entirely in harmony with the conclusions that we drew with regard to the stresses under cars where there is no counter-balance; that is, that there is no increase in stress.

1667 Chart M represents the results obtained by a series of experiments carried on under the direction of Dean Turneaure, at the University of Wisconsin, showing the effect of impact at various speeds, when the effect of counter-balance has been eliminated, and Dean Turneaure's conclusion, as quoted in the transactions of the American Society of Civil Engineers, is to the effect that speed in itself does not increase the stress in the bridge, but that the increase that does result from higher speed comes from the counter-balance.

Chart N shows the relative effect of passenger trains and of a freight train passing over the same bridge, the passenger train at 40 miles an hour and the freight train at 28 miles an hour. This is an actual chart that was traced by a pointer attached to the member of the bridge as the train passed over it. It illustrates the fact that the freight train causes an intense vibration, which is not apparent or which does not appear in the passage of the passenger train, and that was a conclusion which Dean Turneaure drew from his tests.

Chart O shows the results of the Committee of American Railway Engineering Association appointed to investigate the effect of flat wheels on track and track structure. At the left is shown the actual amount of stress in pounds per square inch, while at the right of the chart the scale indicates the per cent of increase of the stress due to the flat spot. This test was made by loading a freight car of 80,000 pounds' capacity and operating it with two flat wheels. I mean by a flat wheel a wheel with a flat spot on it, such as frequently occurs in freight train operation. The flat spot was 2½ inches long, and that is the amount of flat spot allowed by railroads before the truck is removed from service, theoretically; as a matter of fact, flat

1668 spots very frequently occur that are much longer than that before the truck is removed from service, but that is the specification, and this chart shows that under certain cases the impact due from a flat spot two and a half inches long may increase the blow to the track or the pressure on the track seventy-five per cent of the normal. I made a similar test in connection with the work that I spoke of a while ago, and found a 50% increase, which is in accord with this.

Chart P shows a series of observations made by Mr. West, a foun-

dry expert, and reported in the American Society of Testing Materials on the rotundity or the evenness of cast freight car wheels; the deviation from a perfectly round wheel is exaggerated in the chart, but the figures are exact, so that they represent the exact amount. These were of new wheels, twelve of them taken at random, representing the product of several different manufacturers; no one of these was perfect; and the author of that investigation concluded that very few cast iron freight car wheels are perfectly round. It will be observed that as high as four hundredths of an inch in radius, and in one case as high as seven hundredths of an inch in diameter was observed as a maximum variation from a perfectly round wheel in a new cast iron wheel, and in that connection it might be worth while to mention that steel wheels such as are used under passenger trains commonly have a maximum variation of two thousandths of an inch, or about one twentieth of that amount.

Chart Q illustrates the effect of wear on the drivers of freight and passenger locomotives under various lengths of service. It is a well known fact that freight locomotive drivers wear rough much more readily than do passenger locomotive drivers, because of the more slippage; they pull a larger per cent of their capacity consequently the wheels slip more and the wheels wear rough.

In the sixth chart or diagram on this chart is shown the 1669 record of a passenger locomotive that had been run sixty thousand miles. I might say in explanation of this that the straight line represents a developed circle and the wavy line represents the contour of the locomotive driver referred to that perfect circle, or, in other words, the deviation from perfect rotundity, and this chart shows that a passenger locomotive, even at 60,000 miles total run, may be almost perfectly smooth. The one shown in diagram No. 1 is not perfectly smooth, but none of the passenger locomotives, even though the run exceeded that of the freight locomotives, was as rough and uneven as the freight locomotives. Those are all of the charts.

I have, this fall, about two months ago, measured some of these wheels on freight cars, myself. I used a templet turned in the lathe to the theoretical surface of a freight car wheel, and applied that templet to a large number of freight car wheels that were standing on yard tracks at Lawrence. That was not for the purpose of this case. I found that at the present time a very large percentage of the wheels of freight cars are rough, the largest percentage of rough wheels occurring under coal and gondola cars.

Under grain cars I found that 7% of the wheels were flat, the length of the flat spot being one to three inches; under stock cars 16 percent of the wheels showed flat spots, varying in length from one to two and a half inches; under coal and gondola cars 20% of the wheels showed flat spots, varying in length one to three inches. I made a study of the wheels under ten passenger coaches and none of them showed any flat spots at all There was absolutely no comparison between the condition of the wheels on the passenger coaches and the wheels on the freight cars.

In brief, the spring system of a freight car is more inelastic, under heavy load is almost entirely compressed, so that there is very
1670 little additional spring available, while under a passenger coach, where the load is not very great, that is, the live load being a small percentage of the total gross load, the springs are always in a condition to be compressed further, so that the shock absorbing capacity of freight cars, particularly when they are loaded, is very small, while the shock absorbing capacity of springs under a passenger car is always large, that is, they will readily absorb a shock, and not strike a blow to the rail.

A six wheel truck always has at least two of the three wheels resting on the same elevation, that is, one of three wheels may drop into a depression in the track, say at a low joint, and the other two of the three will support the truck. In the two wheel truck, that is not the case. When one of the two wheels drops into a depression in the track, it allows the entire car body to drop, but that is not the case with a passenger coach; the car body would not drop, would not be lowered at all when one wheel would drop into a slight depression in the track, because the other two wheels of the truck, of the set of three, would support the car body.

The effect of this continual hammering which I have spoken of caused by freight traffic is most apparent at the joints, in hammering down the joints and causing low joints. It is also manifest in pulverized ballast and in causing the roadbed to be worked up into the ballast, causing the ballast to require cleaning or renewal. It also pounds the ties to pieces, brooms the ties, as it is called. The ties are compressed and gradually mashed and destroyed under the rail, due to the continual pounding of the passage of wheels.

The rail itself is also injured. Most rail failures I might say result from imperfections, that is, they occur at imperfections in the rail, and flat spots of freight car wheels cause the failure to
1671 occur whenever one of these flat spots happens to strike an imperfection in the rail. If the rail were perfectly sound, most all traffic would be carried over without breaking the rail, but most all rail failures result from the fact that these flat spots and irregularities of the wheel seek out, you might say, the imperfections or defects in the rail, causing the rail to fail—to be broken.

These studies seem to show that the damage done to track by the passage of train is primarily due to the weight and in proportion to the weight of the traffic passing along the track and that the speed of the traffic is not an important factor, that the damage is not appreciably increased due to the speed of the traffic. In continuation of that answer I will say that we observed that the stress was in proportion to the weight, whether the traffic was locomotive or a car, that is, it was in proportion to the weight, one ton of weight of locomotive caused essentially the same stress and damage that one ton of car did, leaving out the effect of impact, which is slight.

So far as the operation of passenger trains is concerned, the chief object in superior maintenance is promotion of safety of operation, because a passenger locomotive is not taxed to its utmost to pull its

train. It could always pull a heavier train than it does pull at a lower speed, if necessary.

The object of superior maintenance, so far as freight operation is concerned, is to decrease the tractive effort, or to decrease the tractive resistance and thereby allow the locomotive to pull a heavier train load. The upkeep of tracks that are used in common between passenger and freight traffic is dependent more or at least as much on the desire to decrease train resistance as it is upon the desire to promote safety of passenger train operation.

1672 Suppose you have a freight train and the wheels are flat, or flattened; every time that wheel revolves, when the flattened part of the wheel comes in contact with the track, there is a blow delivered to the rail. That blow is not greater at a higher speed. The blow diminishes at the higher speeds, at speeds above 23 or 24 miles an hour, because the wheel turns so quickly that the car does not have time to drop down and strike the blow. That that is a fact, is a matter of common observation, and has been well established by laboratory experiments made at Purdue University.

"The Court: Suppose you enlarge the wheel to two or three times its diameter and then increase the speed, would you get a greater blow?

A. Yes, with the increased speed you would get a greater blow if the car body has time to make the drop.

The Court: The drive wheel of the locomotive has its counter-balance; isn't there a blow every time that part of the locomotive strikes the track?

A. There is some blow.

The Court: The locomotive wheel, and the size of the driver on the locomotive is, particularly on a passenger engine, oftimes three times what the size of a freight car wheel would be, isn't it?

A. About two and a third times. The diameter of a freight car wheel is standard 30 inches and passenger locomotive usually about 70, varying a few inches from that.

The Court: Take the same weight of locomotives, wouldn't there be a difference between 15 miles an hour and 60 miles an hour in the impact of the driver?

A. With the same locomotive, yes sir.

1673 The Court: Well, it appears in this case by the proofs so far that some of the heaviest engines on the road are passenger engines. Wouldn't that make a difference?

A. The passenger engines, your Honor, are adjusted. The counter-balance is adjusted for operation at the higher speed. There are two factors entering into the counter-balancing of locomotives; one part of the counter-balance, that is the added weight on the wheel, is to overcome the effect of the crank pin; that is, where the connecting rod is attached to the driver, to balance that. That part could be balanced exactly.

The Court: That would be like on a stationary engine?

A. It may be.

The Court: You use a balance wheel to overcome the inertia on the strain?

A. Yes, that is essentially so.

The Court: On a single cylinder engine there would be a dead center that you have got to go by each time?"

On a stationary engine, there is a shake back and forth of the engine, and traction and steam engines show that the engine jars back and forth. That jar back and forth is due to the movement of the reciprocating parts of the engine; that is, the piston head and the part where it is connected to it; they shake back and forth, because every time the piston goes forward it has to stop, and that causes the engine to lunge forward. Now, this second part of the counter-balance of the locomotive is designed to prevent just that thing in the locomotive, to prevent that shaking back and forth due to the reciprocating parts, and the adjustment of that is dependent upon the speed. Locomotives have their counter-balance adjusted to a particular speed. Freight locomotives have it adjusted for low
1674 speed; that is, speeds at which freight trains are supposed to operate, and passenger locomotives have the counter-balance adjusted for higher speeds; that is, speeds at which passenger trains are supposed to operate, and until the speed is exceeded for which the counter-balance is adjusted, there isn't a very great effect on the impact. Obviously, if a freight train is operated at high speed, inasmuch as it is adjusted to be operated at low speed, there would be a high impact; that is illustrated by all of the observations that have been made on the subject. It is true, theoretically, and it is true from experimental results, and those charts which I have submitted here, show that if your passenger train exceeds the speed for which the locomotive was adjusted, with respect to the counter-balance, there isn't a large impact. In fact, the chart shows that the impact under a freight locomotive at 20 miles an hour was the same as the impact under a passenger locomotive at 58 miles an hour, due to the fact that they were counter-balanced for different operating conditions.

"The Court: Is it wholly due to that, or is it due to the fact that freight locomotive was drawing the heavier load and running at the lower speed, which offsets the higher speed and the lighter load of the passenger locomotive?

A. This result, I believe, was obtained by a test taken where the train was essentially the same, a train especially made up for that purpose, the only varying factor being the locomotive. A train of the same weight was taken. Those were tests made by the Committee of the American Railway Engineering Association. The engine was the only factor that was charged. There is a slight wave of the track preceding the locomotive. We have found that to be the case. It isn't always noticeable, I might say, and I can't
1675 say under what conditions it is and under what conditions it is not, that is, what explains it, but it is noticeable in some cases and in other cases we do not notice it. A wave doesn't cause a high stress in the track, but there is a slight wave in some cases.

The Court: Would there be any difference in the lateral strain upon the track, say, upon a curve due to the higher speed?

A. We made at the University of Kansas some tests along that line, and we did not find any marked increase due to the speed, although our tests were rather inadequate; and it is a fact, been found, I believe, by some observers that there is a slight increase on curves due to speed, but not on straight track. Our observations, I might say, were made on straight track for the most part, although we attempted to find the result on curve, but not very successfully.

I would make one statement, your Honor, in connection with this effect of speed. It is a matter of common knowledge, scientific knowledge, that a slowly applied load causes a greater stress than a rapidly applied load. That is a statement, and experiments can be found in almost any test book on mechanics to substantiate that.

The Court: If the rapidly applied stress or suddenly applied stress is compared to the slowly applied stress, wouldn't there be greater liability to breakage?

A. For the same amount of load, it is not so. I can illustrate it in a rather crude but anomalous way: A phenomen*um* one observes, if he touches a hot iron with his finger; if he holds it there a long time,
he will be burned; if he touches it and removes it quickly, he
1676 will not be burned; that is an analogy, although it isn't an
exact parallel, but the same phenomen*um* occurs. It takes a certain interval of time, and if the load is applied only a fraction of the time required for the transmission of the stress, the whole stress will not occur.

The Court: In other words, if you had a screw pressure brought to bear upon, we will say, a steel rail, the rail would not break or bend any quicker or any slower with that kind of pressure, *that* it would if the same pressure was exerted by dropping a weight upon it?

A. The dropping of a weight, Your Honor, is not quite analogous, because we are likely to confuse the effect of the drop with the actual pressure blow, with the actual load applied.

The Court: No, I mean the combination of the force and the weight produces the same pressure upon a rail?

A. The quicker blow will cause the less deformation. I will just give a laboratory experiment along that line, and I think it will make it clear.

In this laboratory experiment, a wrought iron bar was put under a load of 1,600 pounds, and it gave a deflection of .480 of an inch; that is a little less than half an inch, when it was applied one minute; and when it was applied three minutes the deformation was .632 of an inch, an increase of 29% in the deformation with the same load for three minutes instead of one minute, and in another case a bronze bar gave an increase of 13½% when the load was applied five minutes instead of one minute. In the case of zinc, the tensile strength more than doubled by increasing the speed, and Fisher proves similar results for tin.

1677 The Court: I suppose that is somewhat upon the same principle that if you skate rapidly enough over thin ice you can go over without breaking?

A. It is the same principle exactly. It is a matter of common knowledge in mechanics, and I have references here to a number of text books, if it is required to give them.

Cross-examination.

By Mr. Tracy:

I am 35 years old, graduated from the University of Illinois in 1907, and had railroad experience both before and since. My experience consisted generally of maintenance, construction, designing, and work on location. The work on maintenance and location was on the Scranton Division of the Lackawanna, in 1905, 1906 and then in 1907.

I started my experiments in the fall of 1913, and have been working on some of them all the time, until this fall. My preliminary investigations were published in the Railway Age Gazette in July, 1915. I testified in the Missouri Pacific Rate Case, at Omaha, Nebraska, in October, 1917, on behalf of the state. Defts.' Ex. 320 represents my own experience and data taken from charts of experiments by others. The data on page K is from the same source as on L—from volume 12 of the American Railway Engineering Association proceedings, in 1912. By "deflection of rail" I mean pounding down on the rail. The deflection I measured was the temporary pounding down of the rail from its normal position. By the expression, "stresses," I mean the result of an action inside the material, which is the result of a load, this action tending to rupture the material.

Stress results from, but is not necessarily — proportion to, the deflection, though they are coexistent. I measured the vertical deflection, and the stress spoken of was that resulting from
1678 vertical deflection of the track. I testified only to deflection and stress of the rails, though we attempted observations on the stress of ties as well. While not altogether satisfied with the results for ties, there was nothing that showed anything different than the tests on the rails indicated. We used the same device, in a slightly modified form, for getting the deflection of the tie.

I said 2.5 inches was the limit of flat spot that the Master Car Builders' Association specifies before the car is removed from the service. They run them up to that. As a matter of fact, the effect of flat spot has been definitely proved by laboratory experiments to vary as a third or fourth power of the length of the flat. The experiments are not sufficiently complete to demonstrate fully whether it varies with the fourth power or the third power, but it is somewhere in there. Now, if the effect is the fourth power of the length of the flat, then a flat spot of 2½ inches long, which is the maximum allowed on a freight car wheel, will strike a blow 39 times as great as a one inch flat spot, which is allowed on the passenger car wheel; and if it varies as the third power, or the cube,—the two and one-half flat spot on the freight car wheel will strike a blow 15.6 times as great as the one inch flat spot on the passenger car wheel, operated, I am assuming conditions the same in other respects.

The Master Car Builders' Association limits the flat spots on passenger car wheels to one inch. As a fact, the rigid inspection to which passenger coaches are subjected much more nearly secures that

specification than does the rather lax inspection of the two and a half inch flat spot on some freight car wheels. I found one flat spot in this investigation that was over six inches long, for example, on a coal car, on the Union Pacific Railroad, in a *a* train on the
1679 main line, ready to be moved out of the station. So it is obvious that the flat spots on freight car wheels do exceed the two and one-half inch limit frequently.

The flat spots are more dangerous in cold weather, the commonly-ascribed reason being that the roadbed, being frozen, makes the blow more nearly like the blow of an anvil, on a solid base; there is no compression or resiliency, or give, under the track, and the result is more serious.

A break in a rail from a flat spot comes from what you might call the blow. So far as the rate of application of the load is concerned, the speed of the train is immaterial as to the stress which is caused upon any portion of the track. Experiments have shown that the effect of flat spots diminishes with the increase in speed. I cannot say that to avoid danger from a flat spot they should increase the speed rather than issue a slow order. There may be other causes entering into it, but, so far as the effect of the flat spot is concerned, the effect actually diminishes with the increase in speed. Primarily, though not entirely, the maintenance of track to a certain state of perfection is, as far as the passenger is concerned, for the safety and comfort of the traffic.

Redirect examination.

I think there were two points that came up in connection with my statements this morning that may not have been perfectly clear; one relates to the effect of the counter-balance of the locomotives as compared with the effect of a flat spot on a freight car wheel or any other wheel. They are not similar. The effect of the counter-balance on the locomotive is merely to increase and decrease periodically the pressure on the track; it is not in the nature of a blow; whereas, the effect of a flat spot upon a wheel is a distinct blow as the weight
1680 of the body of the car comes down on to the track.

One other matter I should like to make a little clearer is that the effect of the traffic going over a bridge is very different from the effect of the same traffic over a track that is lying on the ground. Certain of these exhibits refer to tests that were made on bridges, and the tests that I made myself relate to the track itself as it lies on the roadbed, and that matter might not be perfectly clear. A bridge is a whole structure, and each member of the bridge is free to vibrate to a greater or less extent. A bridge is supported at two points, at the ends, and is, in a way, like an immense fiddle-string; it can vibrate. And the members of a bridge are similar, the chords and the diagonals and all the members are not supported at intermediate points, but are supported at the ends, so that they are free to vibrate. Now, as a locomotive passes over a bridge, the effect of the counter-balance on the locomotive will depend very largely upon the vibration of the bridge in time, or in consonance, which is the scientific term—in tune you might say, with the period of rotation of the wheel; that is, if the

bridge, or the mem' er of the bridge, vibrates in time with the rotation of the wheel, the effect is cumulative, and so the stress is much greater than it is if there is no vibration. Now, the large effect of the counter-balance on bridges which has been observed in certain cases, is due to the vibration, and not directly due to the increased pressure of the counter-balance. The counter-balance sets up a vibration in the structure, and the weight of the structure itself vibrating really causes the increased stress, and not the direct pressure caused by the counter-balance. Those were the two points that I think were not quite clear.

1681 EDMUND J. KATES, a witness for defendants, produced before the Court, Nov. 30, 1917.

Direct examination.

By Mr. Groesbeck.

I reside at Lincoln, Nebraska. I am a mechanical engineer, devoting my time exclusively to studies relating to railway equipment and correlated subjects. I was from 1901 to 1909 with the Burlington on its lines west, in Nebraska, starting in the supply department; I was then transferred to the mechanical department and given two years as piece work inspector and foreman in the freight car shops, one year in the main drafting office, on equipment design, two years as shop engineer, in the passenger shop at Plattsmouth, and two years as shop engineer in the locomotive shops at Havelock, with a portion of a year as assistant shop improvement engineer.

From 1909 until 1914, I was in the engineering department of the Nebraska State Railway Commission, first as mechanical engineer and then as principal assistant engineer. During all that time, I had charge of the inspection and appraisal of all the equipment on the steam railways in Nebraska, my chief duties being the collection of data relating to the cost and depreciation of this equipment, and during that time I was also chairman of the Equipment Committee in the Association of Valuation Engineers, among the various commissions of the states, in which capacity I had charge of the collection of equipment cost and life data for the several states west of the Chicago line.

I was on the lines of the plaintiff several days, and inspected quite a considerable portion of the equipment. I inspected some of each of the several types of equipment they have on their line. I made myself familiar with the kind and character of equipment, as to locomotives and passenger and freight cars.

1682 I have a copy of the exhibit of Mr. Fowler (Pltf.'s Ex. 211-214) which contained a list of the equipment as to quantities in the different series and numbers of the series. I am able to estimate the present value of that equipment. The present value that I have attempted to obtain represents the remaining serviceability in the equipment as it exists at the date of the appraisal. I have made an appraisal of the four years, 1914, 1915, 1916 and 1917. As a basis for valuation, I determine first a value new for each item of equipment based on normal price conditions, not on such abnormal con-

ditions as exist today in the equipment market. The basis for my normal price conditions is the actual cost of equipment purchased by the railroads of the United States during the period from 1911 until 1913 and 1914, just prior to the influence of the war situation.

The data from which I take my price units is the actual costs to the railroads operating west of Chicago of the equipment they have purchased in recent years. I have had access during my work in various states, and in connection with my work on this committee of the Association of Valuation Engineers, to the actual costs of practically all of the equipment purchased on practically all of the railroads west of Chicago. That gave me an immense fund of information, from which it was possible to derive averages representing the actual cost to the carriers of their equipment. That gave me a set of units under normal conditions, which I apply to the different types of equipment on the South Shore at the date of the several appraisals, and arrive at a value new, based on the fair, normal cost of new equipment. From that I deduct a percentage representing the used or realized service, and measure the remaining value, the depreciated value, of the equipment on the same basis that a life insurance company uses in setting up a mortality table on human life.

1683 By the normal, I mean the average. I might also say in that connection that I have tested that average with the average for a five year period prior to 1911 and a ten year period to 1911, finding a striking similarity, or agreement, so I consider that the basis upon which I arrived at the new value of these various pieces of equipment is truly a normal price under normal market conditions.

I would hesitate to set up any definite factor of difference between 1916 and before, but in 1915 there was a slight slump in the prices; i.e., the average prices in 1915 would probably be somewhat lower than the average for the period immediately preceding it. In 1916, the war influence was felt, and there was a slight rise or recovery of the prices, though not nearly so much as has been felt in the past year.

My own investigations of the actual history of equipment on the railroads west of Chicago has shown me that the locomotives in service have actually given their owners an average service of 26 years. That is made from a study of a large number of pieces of equipment; for instance, it represents a study on the retirement of *1991* locomotives; the actual service of these two thousand locomotives averages 26 years, and I feel that that establishes a normal period of service which we can safely use in predicating the probable remaining service in equipment today, so far as it relates to that particular class.

As mechanical engineer for the Nebraska Commission, I had access to the records of all the railroads entering the state of Nebraska. As chairman of the Equipment Valuation Committee in the Association of Valuation Engineers, I had charge of the collection of like data for that Association, and in that connection was able to have the valuation engineers of the other states collect the data along the lines that I outlined, so that all of the states col-

1683*a* laborated and furnished me, or rather collected under my direction, the data from the railroads in their jurisdiction. Then, too, since leaving the Nebraska Commission, I have handled cases on several of the southern roads, including the Frisco, the Katie and the Santa Fe, so that I have been able to extend my personal investigations to the equipment on these roads.

My method was exactly analogous to that by which the life insurance companies estimate the probable remaining life of a human being. I set up, first, the curve representing the per cent of equipment remaining in service at the end of each year from the date it was new; that gives me a table of expectancy on the performance of equipment. The average of that curve at the time the equipment is new gives me the average life of equipment. In other words, a freight car can be expected to have 20 years' service at the time it is new. However, if that car lives to be 20 years, it still has some remaining service.

My curves enable me to set up for any period or any age of that car the expectancy of remaining service. Taking the freight car, for instance, as an example, when it is new, it has an expectancy of 20 years, as I stated; when it is ten years old, it has an expectancy of 10.6 additional years; when it is 15 years old, it has an expectancy of 6.6 additional years; when it is twenty years old, it has an expectancy of 3.6; when it is 25 years old, it has an expectancy of two additional years. If it lives to be 30, it still has some probable life, or an expectancy of 1.1 years.

Under my theory, so long as there is life there is hope, in that car. I never would come down to the actual vanishing point in the value of that car. Now, that gives me the expectancy, and by adding the expectancy to the realized life I get a measure of the total expected life. Now, as the value of a piece of equipment exists in the possibility of its use, so its value diminishes as its use has occurred.

1683*b* If at the age of 10 years we have 10.6 years' remaining service in that car, the proportion of its value which has been used by the company, or, rather, which remains to the company, is represented by the relation of this probable remaining usefulness in years of service, 10.6 as against the total represented by the sum of its realized life and probable remaining life, or 20.6. In that case, the remaining usefulness would be 51.4%. Now, 51.4% applied to the wearing value of the car, which in a case of freight cars is 75.3%, gives 38.7 as the remaining portion of the wearing value of the car.

In a car there exists two elements, one which is constant, the salvage value, that does not decrease—it is always in the car. When the car is scrapped, it is returned to the owner; therefore, the depreciation can only apply to the other part, or the difference between that and the total; that other part I designate the wearing or depreciating portion of the equipment value.

My Exhibit 321 represents my valuation of the present locomotive equipment of the plaintiff for each year, 1914, 1915, 1916 and 1917. The column, "Total Replacement Cost," represents the cost to replace that locomotive new, using, as I say, the average or normal price existent between the years 1911 and 1914. I might add that that

price is based on a cost per ton of locomotive and tender, using the loaded weight of the locomotive plus the light weight of the tender, and is a study on which I have been working for the past eight years, which sets up the average cost of locomotives per ton for each of the weights from forty tons up. In other words, the schedule in prices decreases per ton as the weight of the locomotive increases, a light locomotive costing more per ton than does a heavy locomotive.

My study of locomotive prices and depreciation is the result of the analysis of the actual costs of practically every locomotive purchased on practically every railroad west of Chicago, going back for a considerable period prior to 1911. I have used prices paid for locomotives in former years, bringing them up to the normal period by means of a scale of fluctuations in prices. The expectancy table for locomotives was derived in exactly the same way as I described in discussing the depreciation of freight equipment.

1383c

There are three distinct factors making for depreciation which of necessity must be considered in my calculations. The first is the liability to accidental destruction which adheres to the piece of equipment the moment it is placed on the rail. The second is the wear and tear and decreptitude, which is gradual and which culminates finally in the total destruction of the piece of apparatus. The third is the inadequacy or obsolescence which comes to the equipment just as surely as the years go by; no matter how well designed a piece of equipment may be when it is new, the advancement in the art of railroading will bring about a condition finally which has changed the conditions under which that piece of equipment must work and has rendered it obsolete or inadequate to meet the service. The combination of the three make for the total depreciation or elimination of the equipment, and, as my studies are based upon the actual performance of the equipment on these various Western railroads, I have necessarily included in that the liability against these various forms of depreciation.

Exhibit 322 is my valuation of the passenger train cars. The first three columns, as with locomotives, were taken directly from Mr. Fowler's exhibits. The cost to replace is based on my average units of the cost to construct passenger equipment. I paid especial attention to the passenger equipment while I was on the South Shore last week, examining a great number of their coaches and passenger cars,—I am positive over half of them,—so that I could gain a very clear idea as to the character of their equipment. Then, by means of my average prices, which have been worked up as with locomotives from the actual cost to the various companies in the United States, I was able to establish the cost new or cost to reconstruct the equipment in kind, using the normal price—not the price existent at the present time. That, then, was depreciated, as with locomotives and in exactly the same way, to get the present value, or, I prefer to term it, the present fair value, of the passenger equipment in each of the years, 1914, 1915, 1916 and 1917.

1683d

Defts.' Ex. 321*a* represents a valuation of the locomotives on South Shore which have been retired since April, 1914, or, rather, since September, 1913. The locomotives, then, that were in service at the

date of the several appraisals are included in this statement, which should be added to the statement shown in Defts.' Ex. 321.

Defts.' Ex. 324 shows, first, the locomotive price units I have used in the appraisal of the South Shore locomotives. The tabulated statement gives, first, the weight of the engine in tons, and in the corresponding column the price per ton. That weight of locomotive is the weight of the engine in running order, plus the weight of the tender light—that is, without coal or water in the tender. Below is a statement reading that the above prices include the costs of locomotives on the rails of the owner, except the freight from the factory; that is, these prices included all of the setting up and breaking in and messenger service charges, so that the only extra to be added is the freight from the factory, which in this case I have estimated at $6 per ton, that being approximately the cost to get locomotives from Philadelphia to an equal distance in the west. Not having definite data as to the exact freight rates to the South Shore points, I used that factor. The lower half of the sheet shows the price units used in establishing the new value of the passenger cars on South Shore. The statement on the left hand side of the sheet gives a value for the bare car body of the different lengths and different types. 1683*c* This price is sufficient to cover the cost of the body without the trimmings or trucks. On the right hand side of the sheet are the detailed prices for the trucks and fittings. From this schedule it is possible to take a description of a car and set up a table which will represent the normal price of building that particular car. These units are abstracted from the book of units which I have compiled from a study of the actual costs of equipment on the western roads, and represents a fair average normal price existent prior to the European war. The passenger coach price, or the passenger car prices, I might say, cover transportation to a point within a radius of approximately five hundred miles from Chicago, so that in this case it was unnecessary to add to the passenger car units a freight charge to get the equipment upon the rails of the South Shore.

My value on plaintiff's equipment is as described and set forth in Defts.' Exhibits 321 and 321*a*, Locomotives, 322, Passenger Cars, and 323, Freight Cars, for the years 1914-1917. Defts.' Ex. 324 shows the locomotive unit prices used.

KATES.

Cross-examination.

By Mr. Tracy:

I spent three days on South Shore, inspecting all the equipment I could find around Marquette, Ishpeming and Negaunee, the inspection of locomotives being to determine if the South Shore equipment was peculiar in any way to distinguish it from that of other railways of the country. I did not visit the shops and study the shop records as to repairs, or investigate the maintenance. I found nothing peculiar about the equipment.

In reaching my unit prices, I based them on the average of the

prices paid for similar equipment used on the western railroads in the period of time from 1911 to 1914. In arriving at my per-
1683*f* centage of condition, I based that upon the average life of all locomotives and passenger and freight cars of similar classes on the western railroads. I feel confident that my studies give a ratio which is truly reflective of the conditions today, with our present equipment. The percentage I applied was the percentage condition of the average of all the equipment of the same age on the western railroads—those west of Chicago.

I was on the South Shore three days of last week, going from Mackinaw to Marquette, spending considerable time around Marquette, going up to Negaunee and Ishpeming, and inspecting all the equipment I could locate in those two yards, and then spending another day in the yards at Marquette, inspecting every train as it came through relative to the passenger equipment and all of the freight equipment and locomotives that were in the yards at that time.

My inspection of the locomotives was made in the yard simply to determine if the equipment on the South Shore was peculiar in any way from that existent on other railroads of the country. It was an investigation as to type. I did not visit the shops or study the shop repair records, or investigate conditions regarding maintenance of equipment, or the character of water used in the locomotive boilers, and things of that kind. I proceeded on the assumption that, regardless of obsolescence, an engine is bound to wear out, and has an absolute life, regardless of maintenance, my table being computed upon a life of 26 years for locomotives, 33 for passenger train cars, and 20 for freight train cars.

KATES.

Redirect examination.

By Mr. Groesbeck:

On my visit to the South Shore, I found nothing peculiar or unusual about the condition of the South Shore equipment—nothing but what I would expect to find on any other road under similar circumstances. I valued the locomotives purchased in 1913 at the original cost to the company.

1638*g* KATES recalled by defendants December 4, 1917.

Direct examination.

By Mr. Groesbeck:

Defts.' Ex. 327 shows the mortality, depreciation and expectancy curves used by me in my valuation. On the first sheet of this exhibit I have given a brief summary of the processes by which the final ratios were computed. The mortality curve, as shown on the three classes, as I stated in my direct testimony, is history, being

taken from the actual performance of equipment on the western roads. The expectancy curve and the depreciation curve are mathematical deductions made from the mortality curve. The ratios expressed by the depreciation curve were carried forward on to the first sheet, to get them into statistical form, and it will be noted that the ratios shown on sheet 1 of this exhibit (327) are the ratios which I have applied against the cost new prices on the equipment in the appraisal which I have entered for the South Shore equipment.

I testified that the average life of a locomotive was 26 years, but that actual average life really does not enter the computation. The mortality curve and expectancy curve refer to life of remaining service, while the depreciation curve carries that into a value reference; therefore, the mortality curve and the expectancy curve will go from 100% down to nothing, while the depreciation curve will go from 100% not lower than the constant salvage value, or, in this case, 10%.

Take an engine 20 years old; the mortality curve shows expectancy of 9.1 years. We can expect that engine to remain in service 9.1 years more. On the mortality curve, if we add together the per cent for all the remaining or succeeding years and divide that by the height of the abscissa at the year representing the age of the locomotive in question, that will give an average for the additional life. In other words, that is by a mathematical calculation the exact expectancy for an engine 20 years old, as calculated or as shown by the performance of engine in actual service. If we start at the left hand side, the date the engine is new, and plat the percentage for each of the years from nothing down to 50, and divide that by 100, we will get 26 years, which I stated in my direct testimony is the average life for all conditions. That, however, is the only place in which the average life enters this calculation.

1683*h*

The actual cost of each of the locomotives purchased in 1913 by the D. S. S. & A., of the 700 class, was $18,264.50, including superheaters. The unit cost of those locomotives in 1913, according to my estimate, was $15,743. The cause of the apparent discrepancy is that these engines had superheaters. The average on which my basic unit prices are based includes engines which have superheaters and some which do not have superheaters, so that, applied to a group of engines, as is usually found on a railroad, some with superheaters and some without, the average works out. That is illustrated by the memo. I have added to the lower part of that sheet, wherein I have shown a record of the purchase of 316 locomotives during the year 1913, on which the actual cost to the railroad was $8,883,783. Applying to the weights of these 316 locomotives my average unit, I would get a value of $6,968,672, or just slightly in excess of the actual cost. In other words, almost an exact agreement with the unit cost. Now, the units, if applied to a single group of engines which had some extraordinary feature, such as superheaters, would, therefore, be slightly under, and there is no disagreement, then, in this apparent discrepancy with the actual cost. However, if the

unit be applied to engines, none of which have superheaters, then they are in excess, and that is actually what has happened in my appraisal on the South Shore, because I find that none of the other engines on which I based these units actually had superheaters. To that extent, I have given them credit, then, for something which they do not have.

1683*i* KATES.

Cross-examination.

By Mr. Tracy:

Q. I understand that you say the difference is due to the fact of the superheater?

A. No, I didn't mean exactly that. That is one of the things that would make a difference. There might be other things. You might have purchased these particular locomotives under adverse condition. In other words, I was trying to set up that comparison of units. That one actual purchase would be meaningless.

1684 EDGAR FRENCH, a witness for defendants, produced before the Court, Nov. —, 1917.

Direct examination.

By Mr. Groesbeck:

I am a civil engineer. I began railroad work in 1879, and have spent practically all my life in that kind of work. I was with the Grand Trunk Railroad for 22 years, as resident engineer and assistant engineer.

When I left the Grand Trunk, in 1901, I went into industrial engineering with Joseph H. Berry, of Berry Brothers, at Detroit. I had charge of all his real estate improvements and building operations in different parts of the country. I rebuilt in 1903, the Newberry Furnace, on this line; built a varnish factory for him at Walkerville; rebuilt the Manufacturers' Railroad in Detroit; was on the Saginaw & Flint Railroad, in charge of a part of that work; in charge of the building of an interurban line from Bay City to Saginaw, which is work very similar to much of this; rebuilt the Toledo & Detroit, from Toledo to Dundee.

I was in Mr. Barry's employ until 1907. My work with the Grand Trunk was maintenance of way and engineering. I had charge of the construction of all of the work the Grand Trunk did west of the Detroit and St. Clair Rivers, while I was with them, to the time they started double-tracking.

I had charge of building their line from Elsdon across to 49th St. in Chicago, to connect with the Western Indiana; I was on the construction of their line Valparaiso to Chicago, in 1879 and 1880.

I have never had charge of a piece of railroad construction work entering into a new country. I have never had to build where I had any great difficulty, in the transportation end of it. I have never

1685 really had to face the problem of whether in building 400 miles of new line I would have to ballast it as I went along, or ballast it afterwards.

I have recently been working on the South Shore, for the purpose of obtaining data concerning conditions and costs pertaining to that company's property. I began in the latter part of June; I left in August, 1917, on account of illness; and was again there in October, two weeks.

I walked all over the Mackinaw Division, except the branches; the main line from Soo to Marquette, and St. Ignace to Soo Jct.; also went over the Houghton Division, from Marquette to Houghton, and from Marquette to Winthrop Jct. over the south line. That is the old Marquette & Western. I did not walk from Nestoria to the Wisconsin state line. I have been over it a number of times on passenger trains.

I made an estimate of what it would cost under normal conditions in 1914, 1915 or 1916, to do the necessary grading on the various divisions of plaintiff's line. Taking into account the modern methods of moving earth, I figured that the earth could have been moved for 25 cents a yard straight through. I wouldn't change plaintiff's figures on solid or loose rock. The material would be principally sand, though part of it would be muck and clay. In doing the work through swamps with ditching machines, which would be the proper way, you would have no use for corduroy.

1686 HENRY C. ADAMS, a witness for defendants, recalled before the Court, Dec. 4, 1917.

Direct examination.

By Mr. Carr:

I am at the head of the Department of Political Economy, Business Administration and Sociology, at the University of Michigan. I have made a special study of the science of railroad economics and the principles of railroad accounting. I have also made a special study of the permanency of prices due to a condition of war; I have been obliged to study that whole question of war financeering. I have written a treatise on that subject.

My judgment as to whether the high present prices are likely to be permanent is that the prices at present are quite abnormal, and, judging by what has happened in other cases in the past, it is not likely that those prices will be maintained after peace has returned. That applies, in my judgment, to the prices of material and of labor used in railroad construction and operation. My answer is based upon the study and investigation I have made of the matter. I might perhaps add that in the study of war financeering it becomes necessary to trace both the effect of the financial administration of the war upon the prices during the war to find out when that upward tendency stops after the return of peace, and when the period of fall comes. I think it is correct to say that in all cases the movement of prices will follow that general order.

I know nothing in the present situation that would warrant the expectation that the high war prices of the present time will continue after normal commercial and industrial conditions return.

In my judgment, it is unfair to the public to include a valuation based upon the movement in prices. This rests upon two thoughts: one is that it departs from the basis of investment; the other is that under the established rules of accounting the maintenance of
1687 the property brings those increased prices as a burden to operating expenses. That is true, because when a unit of property goes out of service, there is charged to operating expenses the cost of replacing that property at the existing price, so that these increasing prices are taken care of from time to time by concurrent charges to operating expenses. I cannot think it quite fair that these prices should increase the charges that the public must pay for railway service, and at the same time that the railway should include the result of these increasing prices in valuation among its assets. It seems to me that it is counting the same thing twice, which of course would be improper. That is, the public pays it in the form of a charge at the time the particular units of property are replaced, so that if it is necessary to replace, in order to replace in kind a certain unit of property, to charge to operating expenses more than the original cost of that property, operating expenses are called upon to bear the difference.

In my judgment, if the appreciation of any kind which is not offset by a sale of securities, which means a real investment, is included in the valuation of property for testing rates, that is equivalent to a capital profit; that is, equivalent to the actual increase of the assets of the company, and that therefore in testing a rate there should be added to the operating profit which comes from operation this capital profit in order to get the true profit that the company has been benefited. For the purpose of testing a rate when the appreciation is included in the figure used, I would regard the total profit or income as made up of operating profit and of capital profit. On that theory, it is my judgment that appreciation in prices should be regarded as capital profit and added to income if the value of property is taken.

1688 The Court: Suppose there were involved in this suit solely the question as to the adequacy of the return in 1917; what values of property would you take to base that return upon, upon which a return should be given?

A. I should seek for a value which fairly represents the investment of the people who put the money into the business. I do not think I could find a value for testing a rate on this theory of confiscation if I were confined to the particular year when the case arises.

The Court: The peculiarity about this situation, that a rate statute may be constitutional at one time and unconstitutional at another with reference to the same railroad. Taking that into consideration, if we were solely ascertaining whether the statute were confiscatory at the present time, what values of the property would you take?

A. I would take the value which in my judgment represented the investment of the people, of those who put their money into the property.

The Court: Well, let us go a step farther: suppose it were assumed by both parties that the measure of the value is the cost of reproduction new, less depreciation.

A. It is difficult for me to discuss things of that kind because I am not altogether sympathetic with the theory of the costs of reproduction. I think there are a great many mistakes in it and you have assumed that that is correct; but even in that case I should exclude from that value appreciation which did not represent any investment whatever of those who put their money into the property in so far as I could discover in 1917 what that appreciation was.

1689 The Court: Would you do that regardless of what you term war conditions? For instance, to make my meaning plain, we have periods of depression, business and financial, commercial depression, when prices are abnormally low. It has been the history, I think that when the recovery begins it increases for a period of years, for a cycle of years. Now during the period of constantly increasing prices would you take as the basis of value of the property preceding the period, during the period or what might in view of experience be called probable future, or probable future increase?

A. I doubt if it is possible in a case of this kind, seeking after equity, to do equity to either party, if you take your valuation on a particular year. In all the cases that I have been connected with I have insisted at least in taking ten years, and my reason for taking at least ten years is that ten years is the usual period of industrial cycle, so that in those ten years you have had the bad, the good and the excessive; and I feel that in matters of this kind it is not possible to tie one's self down to a particular year, but that we must take the general trend, the average of a period and project that possibly on the experience of the past into the future. It was that feeling that made me hesitate about 1917.

The Court: Of course the larger element which constitutes a price is the labor element. It is true, is it not, that since the panic of 1893, with an occasional year of either stagnation or perhaps a slight decrease, the value of the labor element has constantly increased.

A. That is true in the past few years. It was not true after the war of 1860, that the high prices of labor did not fall. I suppose that at present the explanation of the more or less per-

1690 manency of labor prices is the organization of the men which is entirely a non-commercial fact, and whether or not that is likely to continue after this excessive demand for labor due to the requirement of the transition from the condition of peace to the condition of war and industry, is a very difficult question to answer. I will be perfectly willing to express my opinion on that or anything else, if it is desirable, but it gets into a pretty big subject, of whether or not the trades unions have gotten up as high as they are going to get; that is a pretty big question. There is no question but what at present a large element of the increase of these prices is due to

labor, but it is by no means all. It is due also in large measure to the peculiar war conditions of this country for the two years before they entered the war. It is tied up with the general fact that the financial center of the world is temporarily, at least, transferred from London to New York. It is tied up with the fact of the enormous demand for munitions on the part of European countries which are allied to this country, and which also we had to sell the bonds to pay for. While I recognize that the labor element is very important, I should not like to be understood as conceding that it is the only element in the explanation of the inflation which we now suffer.

Q. You think that is true Professor, that a period of high labor costs is followed by excessive development in labor saving machinery? Has that been a matter of history?

A. That was the result in 1860. Most of the agricultural inventions date from about 1862, and very high in 1863.

Q. Now, will you tell us from the study that you have made of railroad operation, as to the probable effect in your judgment, under ordinary conditions, of a reduction in rate upon the volume of traffic which may be expected.

1691 A. Answering that in a general proposition, it is true that the reduction in any price or any rate tends to increase the volume of sales, in this case, the volume of traffic.

I think my personal investigation on that subject is limited to what is known as the Michigan Central Charter Case, when the Michigan Central sued the State for damages on account of the repeal of its old charter, the result of which was to bring that property from a three cent basis to a two cent basis. In that case the change in the basal rate was followed by a considerable stimulation of traffic. I want, in fairness to the situation, however, to add that there was in connection with that situation the educational influence of the electric lines that are paralleling the Michigan Central, the education of the public to riding and using trains, so that in honesty I should hardly like to go on record as saying that all of the increased passenger traffic, following the repeal of the charter, was due to the change in the price. The reduction of the rate and the education of the public came at the same time, and the education of the public came through actual travel, under reduced rates.

I have made some study and investigation with reference to the historical reasons for the construction of that part of the South Shore system which runs west of Nestoria. I have drawn my historical information on that subject from the Railway Age, the Railway Gazette, the Railway Review, the Commercial Financial Chronicle, the Engineer News, Poor's Manual, the Michigan Railway Reports, some of the New York papers, and the Marquette Mining Journal. I have referred to publications put out at that time, or immediately preceding or immediately following the construction of that line. I went through these publications during the period that would be affected by this case. I took off over four hundred references.

1692 Mr. Eldredge: If I understand, all of this is a part of the Record already. I haven't the slightest objection to it, being

called to your Honor's attention, but it doesn't seem to me that it ought to be necessary to cumber this record with it the second time.

Mr. Carr: Now if the Court please, I don't understand that there is any of this material actually in the record; that the parties have proceeded on the assumption that the Court might take judicial notice of all of this because it is of a historical nature, and as counsel suggests, the purpose is merely to call the attention of the Court to it.

Mr. Wykes: It was in the record for use in brief. I don't know whether it was formally introduced, but it was produced as historical data, and I take it any means for bringing historical data to the attention of the Court is proper.

Mr. Eldredge: I doubt whether this is historical data or not. I haven't the slightest objection to it upon any other ground than that we ought not to put it in the record twice.

The Railroad Gazette of March 13, 1885, quotes the following from the Marquette Mining Journal relative to the purchase of the M. H. & O. and that part of the M. W. Railroad: "We have reason to believe that this sale is part of a general agreement, by the terms of which the M. H. & O. is to at once complete to a point of junction with the Milwaukee, Lake Shore and Western and the D. & M. is to build through to Sault Ste. Marie. The Canadian Pacific is now within sixty miles of the Soo, we understand, and will put its line to that point without delay, when sure that the connecting line is progressing to meet it. The completion of all these lines as indicated will give us the through route between the seaport so essential to the rapid development of this region and for which our people
1693 have waited so long and patiently."

The Court: If this were a jury trial, I am quite certain that the Court would have to rule out any testimony of this kind, I am quite certain it wouldn't be competent evidence.

Q. Based upon this investigation you have made, Professor Adams, will you give us your views of the reasons for the construction of this line west of Nestoria?

A. The line west of Nestoria as shown by the citation which I have before me was built for the purpose of connecting up a through system. It was not built for the local traffic. It was built to make a link between the Eastern Portion and certain railroads centering or terminating in Duluth and Minneapolis; and my interpretation of these readings is that it would not have been built had it not been for the desire to make a through east and west system.

Q. Professor Adams, are these citations to which you have referred and the data that has been available to you in your investigations, in your opinion, sufficient to establish this, as a historical question?

A. Unquestionably.

1694 C. W. HILLMAN, a witness for Defendants, produced before the Court, Dec. 5, 1917.

Direct examination.

By Mr. Groesbeck:

My place of business is at Louisville, Ky. My present residence is Utica, New York. I am a public accountant, specializing in railway accounting and investigations, having been in that work for eleven years.

I have been in a large number of cases of rate litigation, starting with Kentucky on the two cent rate under the McCord Act; following with North Carolina, on its two cent passenger rate case; special investigations for Florida, of railway matters for their Railroad Commission, three cent passenger rate there—a reduction from four to three; freight rate and express rates several times; Alabama on the two cent passenger rate case, combined with a change in commodity rates. I was with them twice. Returned to North Carolina on freight rate matter; for West Virginia in their passenger rate cases, Norfolk and Western and also Chesapeake and Ohio; on freight rates for the coal shippers out of West Virginia; Indiana on its express rates; Illinois on passenger rates and coal rates; North Dakota on coal rates; South Dakota on grain rates and two cent passenger rate case; Ohio coal rate cases; Michigan, two cent passenger Ann Arbor Rate Case. There have been a number of others where I have been in consultation and given testimony.

I commenced work in this case March 17, 1917. I had from three to five assistants, and Mr. Parker had two. In general, my work was to obtain the data from the books and records of the company or by investigations to determine, first, the amount of the expenses chargeable to Michigan; second, how much of those expenses were chargeable to the passenger business; third, how much of the passenger expenses in Michigan were applicable to the regular passenger
1695 and baggage business, how much to sleepers, to diners, and to mail and express; then to determine how much of the passenger business was due to intrastate and how much to interstate; to assign all additions to and deductions from income to these various classes of expenses; to apportion the property values; to determine the amount of capitalization, the value which was applicable or chargeable to each class of business, and then make the application; how much the return would pay in percentage on the investment.

Defts.' Ex. 329 contains my figures and the results of my work. The item taxes will be revised to accord with the actual payments now set forth and used by Delf, the taxes I have used being taken by me on the accrual basis. They will be divided proportional to the value of the property in each class of business.

The plan of the exhibit (329) is indicated by its index. The factors are first stated, being the ratios of our assignments to Michigan and to services. Then follow the expense accounts by items, with a summary; then an analysis of the revenues and income account.

To illustrate my method: Refer to page 27 of the exhibit No. 1, "Superintendence," Maintenance of Way and Structures, 1914. The road system figure is $23,253.50; assignment to Michigan was made on Factor 1-D, the relation of active accounts in this block of expenses in Michigan to the total; the Michigan percentage, 81.0531, equals $18,830.71, superintendence for Michigan. Factor 1-G (page 3 of the exhibit) shows the proportion chargeable to passenger, or 27.1648 per cent, equaling $5,115.32. To assign this to services, Factor 1-J is used, as this is an overhead account, divisible on the balance of the active accounts in the block of expenses.

1696 Referring to account 2, "Ballast" 1914. The Michigan expense was actually allocated; it was then assigned to passenger on Factor 16-A, page 20 of Defts.' Ex. 329. This factor is used as part of the tracks are exclusively freight, part exclusively passenger, and the remainder common to both, the latter, having been assigned to passenger on the basis of the gross weights using the common track. The derivation of the percentages used in Factor 16 is shown on the factor itself, referring for track percentages to Factor 14 and for gross weight to Factor 13. On Factor 14, page 18 of the exhibit, is shown the common trackage, 456 miles, exclusive freight trackage, 165 miles, and exclusive passenger, 2 miles.

As it costs more per mile to maintain main track than sidetrack, the question became the proportion between the two. We adjusted the mileage by treating the main track as two and the sidetrack as one, on the basis that it costs $2.00 to maintain a main track as against $1.00 for a sidetrack. To be liberal, we used this ratio, though our investigations indicated $1.50 per main track mile to $1.00 per sidetrack mile. In my investigations to determine this ratio, I found the road divided into sections, each in charge of a gang. I assigned the actual expenses of maintenance incurred on each section to the section; I then went over the blueprints of sections and took off the percentage of side and main tracks on each section; I then classified the sections, combining all those having 95 to 100% main track, then those having 90 to 95% main track, then those having 80 to 90% main track, and so on, classifying the sections until I came to the other end, where there was less than 10% main track or the bulk of the work was on sidetracks. This gave a series of equations showing how the expenses would be affected by

1697 the admixture of sidetrack with main track or main track with sidetrack, as my sections were scattered all over the road and represented all conditions of the traffic, because the sections having these percentages were not contiguous; they were scattered. I then equated the track and worked out the percentage which would be indicated by the admixture of the different classes of track. The highest percentage that I could obtain by any combination in the whole series was 172%, indicating that for every dollar expended on sidetrack per mile there would be $1.72 on main track. When we combined the results for the four years, the combination of all our percentages and equations gave us $1.49 per main track mile, against $1.00 per side track mile. These figures are derived from the actual operations of company and their actual book charges.

At Marquette, I examined the red books on which the reports of the section bosses are made to show the amount of material and labor they are using in their track. We used them constantly in the assignment just mentioned of maintenance expenses to different sections. I found them incorrect. I did not feel from my examination from prior records that the men making these reports were competent to put in the statement whether it was a freight expense or a passenger expense. I made one test to determine that, on section 34, in 1917, where the section men's report shows a large expense to passenger direct, as well as to freight, and there is not a mile of passenger track on that section. That confirmed my idea that the men were not competent to differentiate between freight and passenger, and I discarded Delf's location for 1917.

To continue as to Factor 16: 82.9078% of the adjusted trackage was common to freight and passenger. The expense of that common track we have assigned to freight and passenger on the basis of gross weight passing over the common track, as shown on
1698 Factor 13, page 17, or 30.108% passenger.

The reason for using the gross weight is that it is indicative of the wear of the track under traffic; the heavier the weight over your track, the more it is worn, and the more repairs and the better upkeep become necessary. This is distinctly shown by this road, where they were compelled to increase their rail and strengthen their bridges, to accom-odate the heavier weight.

The only matter to be determined is whether a ton of passenger traffic over the track has the same effect on track wear as a ton of freight traffic. The objection mostly made against the gross weight factor is that it takes no account of passenger speed. This claim neglects the reverse of the proposition which is that the freight equipment is not kept in as good condition as the passenger and therefore exerts more wear on track per ton moved than does the passenger. The more I have studied the matter the more I have come to the conclusion that the balance should be against the freight and that the freight tonnage should be weighted when the comparison of gross tons is made, and not the passenger traffic. Items to be considered in weighting the freight tons are, first, the construction of the freight rolling stock, running on insufficient springs, cast wheels instead of steel-tired wheels, trucks not balanced to absorb lateral and vertical pressure, and second, the constant nosing of the freight cars due to inequitable loading and to the exertion of the engine as it pulls from side to side, moving more slowly, jerking the cars backward and forward. This constant snake-like weaving motion can be noticed by sighting down the side of a train moving over the track. In the passenger train, the higher speed prevents to quite a large extent, this weaving motion. The engines are compensated for the load they have to draw and for a
1699 given speed; so long as the speed is retained within the limits of compensation there is no more hammer blow for the passenger than for the freight engine; when that speed in either passenger or freight engine is heavily exceeded, the hammer blow is more manifest than at regularly compensated speed.

In freight traffic, there are a number of flat wheels, which do not exist in passenger traffic. When a passenger car gets a flat wheel, it is repaired. In freight, it is not done with such frequency, and there is more latitude allowed in the number and size of flat spots than in passenger traffic. A flat wheel, from its very construction, must deliver a blow on the track.

To divide common Maintenance of Way and Structures Expenses, I used the gross ton mile basis.

A train slows up approaching a weakened bridge because on a bridge vibration has a very deleterious effect. When a bridge is weakened, it is necessary for them to go slowly over it in order to reduce the frequency of the vibration so it will not come to a danger point. On a bridge there is always a possibility of accident from the weights passing over it, and if a train is moving at a slow speed and the bridge gives way under the weight, the train will not be thrown off the bridge into the river or ravine, or whatever it is they are crossing. I think that has more to do with the matter than vibration.

My idea is that the slow orders over the bridges are for the prevention of accidents, as an accident is more dangerous at high speed.

The train miles enter into certain of my divisions of accounts. It is used in the item, 202, "Railway Maintenance," page 227 of Defts.' Ex-. 329, 221, "Fences," page 228, 223 "Snow and Sand Fences and Snowsheds," page ——, 225, "Crossings and Signs," page ——, and 372, "Dispatching Trains," page 238.

1700 For Dispatching Trains, inquiry developed that one-third of the dispatcher's time was spent in train movement, and the other two-thirds in the distribution of cars over the line in order to move the freight.

Since the attention of the dispatcher to individual passenger cars is infrequent, I have considered two-thirds of the dispatcher's time to be used in the distribution of freight cars and chargeable directly to freight. I considered it desirable to make the adjustment in this account, instead of burdening account 373, "Station Employees," with this matter.

When a train dispatcher sends an order, there is a reciprocal receiving service at the other end in the passenger station, which — taken care of by the operator there. In making our distribution of station services, we have not considered this time taken by agent-operators in receiving train orders. That we may have recognition of that service, I assumed that, though the train dispatcher's pay is higher than that of the men to whom he is sending the message, just as much of their time, as expressed in money, would be consumed in receiving his orders as of his in sending them. I have, therefore, taken one of the other thirds of his time and charged that to dispatching trains. As I had already charged of- these men's services under my Station Employees a certain percentage of their time to the passenger business, it was necessary to charge only the difference between the two percentages on the second third of the dispatcher's time to the train movement in order to determine the exact amount that should be in station service on this account, but, for convenience sake, had been recognized in this dispatching. This gave me a total percentage of

68.3911%, which, divided by three, gives 22.7967% of the dispatcher's time chargeable to the passenger business. The dispatcher is located at Marquette.

1701 The messages of the dispatcher controlling a train would probably be taken by every operator along the line, as a matter of information to other trains which might want orders or information for the passengers. All the time necessary for such messages and the dispatching of trains is considered by me to be included in this one-third of the dispatcher's time. I have offset the time of the dispatcher and his assistants as against that of the operators who receive the message. The taking of the message by the operator, to post his bulletin according to law, has reference to passenger trains. I did not take into account the question of the train dispatcher's higher salary as compared with the numbers on the other side. The numbers of the station agents would certainly offset the higher wages, perhaps exceed it.

I used engine miles for divisions of expenses, but where that has been used it has been pretty thoroughly agreed upon between us and the railway company. I used other special factors for the division of certain expenses, which are shown in the exhibit. I made a study of the Mackinaw Trans. Co. and assigned its expenses to freight and passenger on the basis that two freight cars equal one passenger car, that being the basis indicated by the road in its division of expenses. The receipts are almost entirely from passengers and taking passenger expenses from the receipts shows the passenger-carrying business of the Mackinaw Trans. Co. to be profitable. The freight cars are handled over the Mackinaw Trans. Co. ferry without charge, and the expenses divided up among the three owning companies. The plaintiff handles the Soo Line freight cars over the ferry, and the net expenses to the plaintiff are split up with the Soo Line on the basis of cars handled. The Soo Line thus participates in the passenger earnings over the Mackinaw Straits. The totals of this divi-

1702 sion have been worked out by Mr. Parker. The profits of the Mackinaw Trans. Co. on the passenger business was, for the various years, 1914 to 1917, as follows: 1914, $30,450.38, 1915, $27,126.71, 1916, $27,814.50, and 1917, $23,483.21; this is the entire profits, and not the plaintiff's share. To arrive at these profits, I have charged against the passenger earnings the passenger proportion of the entire expenses. There is a loss on freight traffic, and the expenses of that traffic are supposed to be divided between the three roads in proportion to the traffic of each. The only way the plaintiff participates in that profit is through its stockholding in that corporation. The basis of any consideration of the Mackinaw Trans. Co. is that plaintiff's trains are ferried across the Straits, and that this is a ferry bridge.

Referring to page 226 of Defts.' Ex. 329, the Mackinaw Trans. Co. operations are not included in my figures, but this company stands on its own feet, leaving the question to include or exclude it at the discretion of the Court. My computations with reference to the Mackinaw Trans. Co. appear in Defts.' Ex. 330.

In my computations, I have stated the Mineral Range as standing

by itself, as an item of expense which can in no wise be considered as having reference to the matter here in controversy. From Houghton to Calumet is a distance of 14 miles. I have taken the expenses which accrued upon and are directly attributable to that run and set them to one side, since the plaintiff received no compensation for that run; the fares all go to the Mineral Range Road, and therefore in the computation to determine the efficacy of the two cent passenger rate on the plaintiff's road these expenses should be set aside before any computation of that character is made. When I say that there is no compensation whatever, I am referring to the collection
1703 of fares on this 14 miles. There is a slight compensation, which I have taken care of, and which Mr. Parker took care of in his exhibits, for two of the trains which run up there, the C. M. & St. P. trains pay a certain rate which might be called a mileage charge, and of that mileage charge I have taken into my earnings on the D. S. S. & A. only the D. S. S. & A. mileage proportion; and against the Mineral Range run expenses, which I have set off, I have credited their proportion, the 14 miles, of this revenue or rental received from these trains, or privilege payment for running these trains.

The expenses set out for the Mineral Range are on a mileage or percentage basis, and I take out the total operating expenses of the train, including Maintenance of Equipment, Fuel, and Train and Enginemen's wages.

I have investigated the average tie life, the renewals and costs of ties, and the number of ties of different kinds of wood, on the plaintiff's railroad, and Defts.' Ex. 331 pertains to that subject. The line at the bottom of the second sheet, "Average for 10 years," shows the average tie life. This was for 10 years ending, in 1911, 11.69 years, in 1912, 11.81, in 1913, 11.38, in 1914, 10.47, in 1915, 10.20, in 1916, 10.14, and in 1917, 9.92.

The costs for ties stated is the price paid for the ties delivered on the plaintiff's property. I think it includes nothing for distribution. The data for Defts.' Ex. 331 was obtained from the company's reports. I find that the price stated is that at the distributing point and I should say includes inspection charges and distribution into a yard ready for use. The I. C. C. interpretation of the account, "Ties," is that it includes the cost, the labor of handling, distributing and putting in track is charged to account 220, "Track Laying and Surfacing," which would indicate that the price includes nothing beyond inspection.

1704 I investigated the reciprocal service which passenger service furnishes for the freight, and vice versa. The freight performs service for the passenger, in hauling company material afterwards commonly used. In my gross ton weight factor, 13, will be found the company material ton miles. The car weights carrying this company material are all included in my car miles as taken from the books of the company, so my gross total weight includes the company material and charges that much of the expense to freight. I have made a computation by primary accounts, to show how much this would affect the total carried. I find the total passenger per-

centage of the freight service due to carrying company material would be 1.1%, that is 1.1% of the freight expenses is undertaken in carrying the passenger material. On the other hand, there is a reciprocal service in passenger for the freight; e. g., in 1915, plaintiff's passenger miles were 29,682,083; that year, annual passes were issued for 2,165,113 passenger miles and trip passes for 2,346,867, a total of 4,511,910, which is 13.2% of the total passenger miles. Reducing these according to the general distribution of payrolls between freight and passenger, the conclusion is reached that 4.9% of the total passenger miles were issued in passes on freight account, which, multiplied by the general average of freight expenses to passenger expenses, gives 1.57% of the total expenses as chargeable to the freight account from passenger service, as against 1.1% of the total chargeable to passenger. 1.57% of my total expenses should be charged to freight and 1.1% to passenger. I have so many passenger miles; the resultant would be the cost per passenger, whether he paid his fare or not, and in freight a ton of company material accounts for just as much as a ton of revenue freight. In taking the payroll, a man drawing $150 a month would count three times as much as a man drawing
1705 $50, but I have no means of determining the specific employees using passes. It might be more nearly accurate to divide it on the employees, rather than the wages, until we come to those employees having duties in both passenger and freight. I think it would be more nearly accurate to divide according to the number of employees, and then to divide the common employees on the basis of those located rather than on the salaries or wages paid. There is no direct relation between wages paid and the miles the man is dead-headed. The only relation would be that passes are distributed over the whole service, and the measure of the pay would indicate the general number of men in the different services. I think it the rule that the employee carried must have transportation. I ascertained the number of miles from the stubs of the passes. This includes passes issued to members of the employees' families. If it was strictly followed out, there would be a slight charge against the freight service and a credit to the passenger—the difference between 1.1% and 1.57%. This does not enter into the computation in Defts.' Ex. 329. By material carried in freight trains, I include coal. It might be well to mention that official cars, in the service of both passenger and freight business, are charged in toto as to repairs to passenger service.

On account 201, "Superintendence," M. of W. & S. 1917, Ex. 329, Summary, page 249, I assigned to passenger $5,012, and Delf assigned $7,811, the difference being caused by the fact that it is an overhead account, treated alike by the both of us, and the underlying accounts are not the same in amounts.

Account 202, "Roadway Maintenance," page 227 of the exhibit I locate on Factor 16, line 9, which separates the exclusive track maintenance, per Factor 14, and the balance on the train mile factor including switching. Mr. Delf used his modified revenue train mile basis for the entire account, setting out his so-called allocated

1706 exclusive maintenance. I used my basis for setting off the exclusive from the common. In this account, maintenance is not dependent on wear, but facilitates the passage of a train as a unit. I believe my method closely approximates the use or tells the cost of maintenance for each service.

In account 208, "Bridges, Trestles and Culverts," my difference of $2,900 plus less than Delf is due to his use of the modified revenue train mile basis, while I divided the common on gross weight basis, Factor 13, as the weight measures the use of the bridge.

In Account 212, "Ties," I charges $12,910 to Michigan passenger, and Delf $21,775, the difference being due to Delf's use of the modified revenue train miles and my use of the gross weight basis for common. Parker and I both used the gross ton mile factor for this account. We differ slightly, because I have included the company materials and carried out my percentages a little farther.

I meant, when I said I had not included or charged for carrying company material, that I had not entered the amount due to company materials on the passenger account and made a like adjustment in freight for service performed by passenger. The total cost of carrying company material is now charged to the freight business, it being offset by the 1.57% of passenger service above described.

As the cost of carrying freigh' employees and their families is included in my passenger expenses, I regarded the 10 tons of passenger loading sufficient to include that. Including company freight, the gross weight basis on common track is 30.108% passenger; ignoring it, it is 30.629% passenger, for 1914.

1707 Accounts 214, "Rails," 216, "Other Track Material," 218, "Ballast," and 220, "Track Laying and surfacing," are assigned by me on the gross weight basis, and by Delf on the modified revenue train mile ratio, my ratio of 21.3972% being further modified by the separation of exclusive tracks, as against Delf's 42.21%. Delf takes out the exclusive in another method, so the percentage would not be comparable at this point.

(If witness followed Delf's method, he would first set off the exclusive track and divide the balance of the common by a different percentag—25.6875% passenger.)

I would first take 17.28% of the total expenses and set it off to freight and .1988% to passenger (Factor 14), and the balance, 82.5238%, I would divide on the gross weight basis of 25.6875% (Factor 13). Instead, I have combined the two percentages into a total percentage (Factor) of 21.3972% passenger (Factor 16). I have combined the equated track and gross ton miles in one factor.

I do not accept Delf's so-called allocation to exclusive track, as my investigation led me to discard the reports of the section men as being incorrect. The records on which plaintiff claims to have separated the maintenance of exclusive track were not records regularly kept in the conduct of the business. It was a side record, kept to meet the order of the I. C. C. to locate everything as far as possible. I do not consider them reliable.

Account 221, "Right of Way Fences," I divided on the train mile basis; Parker on the time ratio.

Accounts 223, "Snow and Sand Fences and Snowsheds," and 225, "Crossings and Signs," are assigned by me on Factor 11-E, revenue train miles plus switching, and by Delf on modified revenue train miles.

In account 227, "Station and Office Buildings," page 229
1708 of the exhibit, both Delf and I allocated to freight certain amounts and to passenger $1,764. The remaining common, of $4,541, Delf assigned on modified revenue train miles, 42.21%. Of this $178.98 referred to the Marquette station. After assigning the excess over that amount, of $4,362.21, on the basis of account 373, the portion of the Marquette passenger item relating to the building commonly used for the general purposes of the line was split 50-50, the results being shown in 227-B.

Account 231, "Water Stations," I divide on the basis of accounts 385 and 397, and Delf on accounts 382 and 394.

Account 233, "Fuel Stations," I divide on the basis of accounts 382 and 394. Delf and I differ on this, in the assignment to Michigan, as he permits the entire expenses to remain in Michigan, while I percent them over the system, on the theory that the use of water or fuel stations extends beyond their actual location.

Account 235, "Shops and Enginehouses," I split between shops and enginehouses, locating the enginehouses to Michigan and spacing the shops over the entire system, charging to Michigan only its proportion of the shops which they have used. 'This is done on Factor 2, line 1, page 208 of Defts.' Ex. 329, showing the repair account in shops as located in Michigan, 81.5%, by splitting the engine repairs on engine miles, the car repairs on car miles, freight and passenger, and the work equipment on work equipment miles, between states, which would result in the proper charge to each state. Those four repair accounts are then combined, and that is the use to which your shops have been put. I consider that a more equitable division than Delf made, as Delf's method leaves the entire shop expense in Michigan, regardless of the fact that work is done for service outside the state.

1709 In account 247, "Telegraph and Telephone Lines," Delf and I agree on the location to Michigan, but he uses modified revenue train miles, while my factor is overhead to the transportation block of expenses. The telegraph service is mainly in the conduct of the transportation business and can well be considered overhead to this business.

Account 249, "Signals and Interlockers," I assigned to passenger on a special investigation of the occupancy of tracks by time and the number of trains, which shows 5.24% passenger. Mr. Delf used modified revenue train miles.

Accounts 265, "Miscellaneous Structures," 269, "Roadway Machines," 271, "Small Tools and Supplies," 274, "Injuries to Persons," 275, "Insurance," 276, "Stationery and Printing," and 277, "Other expenses," we take as overhead, while Delf uses modified revenue train miles.

In account 272, "Removing Sand, Snow and Ice," the 1% to passenger and 70% common was by agreement with Delf. To divide the 70% common, I used train miles plus switching (Factor 11-E) while Delf uses modified revenue train miles.

In account 278, "Maintaining Joint Tracks, Yards and Other Facilities—Dr.," the difference from Delf is only $33.

In Account 279, "Maintaining Joint Tracks, Yards and Other Facilities—Cr.," in the freight, passenger and common assignment, Delf and I agree. The $5,092, common, Delf divides on modified revenue train mile basis. I separate into tracks, roundhouses, water tanks and other common expenses and divide the first three on the basis on which expenses were charged at for these various items for passenger. Delf's credit figure is $6,171, and mine is $5,252.

1710 Under the Maintenance of Way and Structures group, my charge to Michigan passenger is $131,341, and Delf's is $205,704, a difference of $74,363.

Under Maintenance of Equipment, I charge $109,056.64 to Michigan, against Delf's $111,624. In this group, I have assigned a portion of the Michigan passenger to the Mineral Range run. Delf made no similar assignment; e. g., under account 308, "Steam Locomotives-Repairs," we assigned to the Mineral Range that portion of the engine repairs which the mileage of their runs bear to the total passenger engine miles. I charge the Mineral Range run with a portion of the expense of account 309, "Steam Locomotives—Depreciation," 317, "Passenger Train Cars—Repairs," according to the mileage of passenger cars on that run, considering only the South Shore cars; also account 318, "Passenger Train Cars—Depreciation," and account 301, "Superintendence."

Under the group, "Traffic Expenses," there is no appreciable difference between Delf and myself.

Under Transportation Expenses, I have charged against Michigan passenger, for 1917, $347,480, against Delf's $327,337, a difference of $24,857. A number of minor differences between Delf and myself appear in the exhibits. Only the larger items will be here mentioned.

In account 373, "Station Employees," I charged to Michigan passenger, for 1917, $21,986.56, against Delf's $42,781, a difference of $20,795. We both located $79,330.95 to freight and $11,412.97 to passenger, leaving as common $84,072.96. As about 53% of this account had been located to freight and passenger, I divided the common on the basis of the located. I thought it a better factor to take a located expense than to reach over into some outside factor, such as modified revenue train miles, whose bearing on the

1711 question is not particularly direct. I confirmed the propriety of this basis by taking Marquette station, where they had both freight and passenger work and where the force was divided. I then took the freight and passenger receipts for Marquette, and found that for every dollar of freight handled in the city of Marquette the cost was 4.06 plus cents for station service, and that for every dollar of passenger business the cost was 2.617 cents. Applying the 4.06 to the total freight receipts of the road, of $3,394,-

350.53, gave me $137,888.12, and to the passenger receipts, of $668,-898.18, applying 2.617, would give $17,503.65. The comparison indicates a percentage of 11.26421 passenger. I have used 12.5769% passenger.

By freight handled, I mean the receipts at Marquette, for freight received and forwarded. The agent has to take it in and take care of his dollars when they come in, in billing and collections, and when they go out he has to take care of his freight and bill it out. In other words, he has to have dollars in and dollars out. I mean, by freight handled, the freight consigned to or shipped out of Marquette. If freight is received at Marquette it is included; if simply rehandled, it would not appear. This was simply in confirmation of my percentage. The trouble about taking a station which was not a division point was that they haven't the accounts split up into passenger and freight, excepting at points that are subject to criticism. Mr. Delf divides account 373 upon the modified revenue train miles basis.

Account 376, "Station Supplies and Expenses," is treated in the same way as 373.

In account 404, "Signal and Interlocker Operation," I assign 5.24% to passenger, against Delf's 42.12%, modified revenue train miles.

1712 The difference between Delf and me in the item, 372, "Dispatching Trains," and the methods I used, have already been commented upon.

Under Transportation Expenses, I assign from the Michigan passenger proportion to the Mineral Range run various items, aggregating $14,568.07, and Delf makes no similar allowance. Under account 371, "Superintendence," $234.76 is assigned to Mineral Range. I also charge the Mineral Range in account 392, "Train Enginemen," $3,239, being its proportion according to mileage; under account 394, "Fuel for Train Locomotives," $6,384.51, being mileage proportion; I also make charges to Mineral Range in accounts 397, "Water for Train Locomotives," 398, "Lubricants for Train Locomotives," 399, "Other Supplies for Train Locomotives," 401, "Trainmen," and 402, "Train Supplies and Expenses."

Under the group, "Miscellaneous Operations," there is no difference between Delf and myself.

Under the group, "General Expenses," we both divide as overhead to the balance of the operating expenses. There is a necessary difference between us because of our difference in previous assignments. Under this group, I charge passenger with $24,359.49, against Delf's $27,661.

For the year 1917, I have total charges against Michigan passenger of $685,491.51, while Delf has $790,721, a difference of $105,230. This is made up principally in track wear account, maintenance of way expenses, station services, station supplies and expenses, and dispatching trains.

The $19,095.72 charged to Mineral Range would reduce my $685,491 when I come to assign to interstate and intrastate, as that there disappears.

In 1914, an addition to the Thomaston enginehouse, located 14 miles east of the Wisconsin line, necessitated a charge to
1713 operating expenses of about $40,000. This expense I divided to states according to the service rendered by that enginehouse, assigning to Michigan passenger on account of it $4,923.49, which was considerably less than Delf's assignment. My total assignment to Michigan passenger on account 16, "Buildings, Fixtures and Grounds," for 1914, page 33 of the Exhibit, was $11,293.42.

In account 241, "Wharves and Docks," the passenger expenses for repairs of the ship dock at St. Ignace are assigned on the basis of one passenger car equaling two freight cars, which is the method adopted by the company. I call attention to it as that is the basis of our assignment of passenger expenses of the Mackinaw Trans. Co., it being the company's established ratio.

In Factor 11, I include the mileage of light engines, as they receive the same protection by the dispatcher in giving orders as a regular train mile. From my examination of plaintiff's accounts, I find that, outside the freight service, the losses, if any, are incurred in the mail and express and sleeper and diner business. I should say that, so far as the express business is concerned, the matter can be readily cured by contract, as the Soo Line owns the express company and the Soo Line and plaintiff are both controlled by the C. P. R. I treat the mail and express as an outside service.

West of Marquette, the foreign sleeper service is duplicated. While the dining service is furnished principally by the plaintiff, there are diners on the so-called Chicago runs of the C. & N. W. and C. M. & St. P., which are of little, if any, service to the intrastate passenger. They are maintained for the benefit of the through run, with the exception of passengers from Menominee and Escanaba.
I have no method of measuring that service. There is a diner
1714 on the C. & N. W., into the Copper Country, put on at Escanaba. I have shown in my exhibit the outside or auxiliary services separately, with the losses which pertain to each class of traffic.

Defts.' Ex. 332 is the State's claim of valuation in 1913, plus additions and betterments each year since, with an assignment of the values to passenger and freight for each consecutive year, which shows the values and divisions for respective years as follows:

Year.	Total.	Freight.	Passenger.
1914.....	$11,674,752	$9,108,698	$2,566,054
1915.....	11,697,474	9,098,716	2,598,758
1916.....	11,526,134	8,906,240	2,619,894
1917.....	11,875,868	9,231,665	2,644,203

The assignment to services is upon the factors in Defts.' Ex. 329. On the first sheet of the valuation exhibit the factor used is indicated. The additions for each year have been carried forward upon the factor noted. Direct allocations to passenger are marked "P" and to freight "F." For rolling stock, the values of Mr. Kates

were taken for each year and assigned on the basis of the mileages for that year.

For example, all track structures, such as ties, rails and ballast, are divided upon the gross weight basis, Factor 13-A. No exclusive track is set off, as that has been allocated, and does not appear in the common property. My factor of gross weight for 1914 is 30.108%, as against Delf's modified revenue train mile ratio of 45.09%.

I deem it necessary to divide common property on the same ratio or factor as I use for expenses. The reason is that there is a common use of the common property, and if we can find the
1715 factor which governs the use, it must necessarily govern the value which is used. It necessarily follows that, if the Court adopts my division of operating expenses applied to the track structure and roadbed, it must also adopt my division of the property on the same ratio, and if the Court should adopt Delf's division of expenses, I believe it should adopt his division of property.

In dividing expenses, I based all my methods as closely as I could obtain it on the actual use of the property, to the factor which it wears out and therefore shows its use, and when that is done the value of the property would be measured by the expense.

Defts.' Ex. 333 takes the Master's value for 1913 and adds to it from year to year the net additions and betterments. According to the same methods as indicated for Defts.' Ex. 332, this exhibit by the use of factors divides the value to freight and passenger.

Mr. Groesbeck: While items 35, "Engineering on Equipment," 37, "Contingencies," 43, "Working Capital," and the item "Appreciation" are listed on Defts.' Ex. 333, we claim they should not be included in the value.

They are included because the Master included them. Upon Defts.' Ex. 333, the various values are shown as follows:

Year.	Total.	Freight.	Passenger.
1914	$14,451,525	$11,147,160	$3,304,365
1915	14,474,319	11,087,938	3,386,381
1916	14,241,544	10,871,582	3,369,962
1917	14,449,251	11,085,443	3,363,808

For Defts.' Ex. 333, I have used the same unit prices, for 1917, that the Master adopted for 1913, plus the actual expenditures, according to reports, for each account. This means I have
1716 started with the Master's valuation and have made no depreciation since 1913.

Defts.' Ex. 334 is a combination of the Defts.' Exs. 332 and 333.

I have made a study of plaintiff's passenger traffic for the Western Division, from Nestoria west to the state line. The passenger miles on that division were:

Year.	Interstate.	Intrastate.
1916	5,090,983	1,072,032
1917	4,154,501	1,324,074

The constant sleeper costs on plaintiff's railroad, meaning those costs which would remain the same if the sleepers had not been run, as charged in the various accounts of Defts.' Ex. 329 to sleepers, for the years ending, June 30, 1917, were $40,590 for 1916, $42,686, for 1915, $38,326.

From my investigation of plaintiff's accounts and business I find that during each of the years, 1914, 1915, 1916 and 1917, plaintiff was making a fair return upon a fair value of the property used in the intrastate passenger business. That is my judgment.

1717 C. W. HILLMAN.

Cross-examination.

By Mr. Tracy:

I have been a witness in many rate cases of which I have mentioned the most important.

In the Western Passenger Fares Case before the I. C. C. the methods I used in dividing the accounts were substantially those I have used here. After dividing expenses to Michigan, my first effort was to find the amount assignable to maintenance of exclusive freight tracks. In general my method was to take a ratio, assuming it cost half as much to maintain a mile of side track or freight branch as a mile of main line, thus producing an equation resulting in my assigning about 17.27% of the total maintenance expense of track structures such as rails, ties, track laying, surfacing to the maintenance of exclusive freight track. I did not accept the Delf claimed direct allocation of the expenses for 1917, to different tracks because I felt the figures were not correctly reported by employees—they were not correctly assigned to freight or passenger. I referred to section 34 showing the amount assigned to passenger by the section foreman when there was no passenger track there. That assignment appears in September, October, February, March, April, May and June in varying amounts, the year's total being $1,525.54. That is the amount entered in the passenger column by the section foreman. I do not know whether that was corrected at headquarters. I find Mr. Delf assigned to exclusive passenger $793. The errors were in track material. I do not look to see how his labor book checked with that. I made this examination to determine whether the reports were correct and finding them unreliable I paid no further attention to it.

1718 I knew that they were not carried in by the company as a passenger item though reported as such. I abandoned the idea of allocations and undertook to determine the amount by estimate. I did not consider that they were allocations. My estimate is based on the assumption that one to two is the relative cost of maintenance of side track to main line. I confirmed my basis for this figure by taking the total expense for every section and comparing it with the total amount in the section. There was no such report except in 1917 when they commenced to report between freight and passenger. A number of things led me to doubt the accuracy of the report; it is a new innovation, the men are not used to it and I made

this investigation to determine whether I should accept the red books (Defts.' Exs. 335-336) or discard them. I took the total of each section foreman's report of material, priced it with the regular price list and calculated it out. This expense could be allocated if the company gave the proper directions and had bright enough section foremen to report it; they would have to give specific instructions as regards, for instance, a switch located on main track leading to a side track. The work of that switch would be done in main track yet the entire work would be chargeable to the side track.

After I obtained the assignment to exclusive freight track I divided the common portion of the maintenance accounts according to a number of ratios. For several I used the train mile ratio, but for the greater bulk of expenses I used the gross ton miles. Page 218 of Defts.' Ex. 329 shows the basis of my gross ton mile ratio for 1917. That includes the ton miles of company freight. That is included, though not properly chargeable as a freight item, because in my opinion it is more than offset by the free service given by the
1719 passenger train in carrying employees on passes. That is not the reason I included it. The reason for including it is because it is part of the freight service. The object of analyzing it was to determine how much of the freight service should be charged back to passenger. I decided to make no charge of that to passenger as it was more than compensated by the service given by passenger to freight. In the figures of miles on annual and trip passes I included travel by employees and their families for business or pleasure, and annual passes used by officials of plaintiff and other roads including exchanges. They are given to officials of other roads in exchange for passes to officials or employees of this road. If an employee, freight, passenger or common of plaintiff was compelled to make a company business trip to Chicago, an exchange pass would be requested for him. If it was properly company business his expenses would be properly chargeable to operating expenses and to the extent that he was able to travel free on other roads the operating expenses of plaintiff would be reduced. Exchanges passes are given on this theory. I made no attempt to find the amount of exchange passes.

In computing the gross ton mile ratio we take each car and each engine and multiply its weight by its mileage made. We multiply the ton by the distance it moves. That is on the theory that the expense of maintenance of the structures to which this ratio was applied is measured by the weight passing over it during the course of the year by the several classes of business. The ton mile is the measure of expense because in my opinion it causes it. I make no direct computation on account of the speed but it is not lost sight of. Defts.' Ex. 329, p. 219, 1917, contains my computation by which I obtained the apportionment of expenses assigned to exclusive freight
1720 tracks. That is 17.27% to exclusive freight. In other words, equating track two to one I find that 17.27% of the tracks are exclusive freight. It appears that a little under 5% of the tonnage was carried on these exclusive tracks, though I am not sure. (See later testimony.) Assuming the figures of the exhibit to be correct

it would be practically 6.5% of the freight which is made on the main track. Applying the 51,000,000 ton miles made on exclusive freight track to all ton miles on all tracks, freight and passenger, the percentage is 4.9%. This 17.27% is no theory, it is a fact. If they do not reconcile it is correct that my theory is wrong and the fact right. I think, you will find the facts in consonance with the theory.

Page 235, Defts.' Ex. 329, shows accounts 326, 327 and 328, Work Equipment divided between passenger and freight as overhead to the maintenance of way and structures expenses. The 1-8 factor opposite account 326, should be 1-7. Account 328, Work Equipment Retirements, I assigned to services on factor 1-17, not on 1-7 as misprinted.

Accounts 326-328, Work Equipment Repairs, Depreciation and Retirements, were all assigned to services on the same percentage, 1-17; in assigning these accounts as overhead to the maintenance of way group I follow the same theory as Delf. Whatever way the court decided, they would follow the apportionment of maintenance of way expenses.

Defts.' Ex. 329, p. 238, station employees—the common portion, I have divided between passenger and freight on the basis of the allocations using the same allocations as Mr. Parker. The allocations were checked over with Mr. Delf. The stations that I used were the Soo, St. Ignace, Marquette, Negaunee, Ishpeming and Houghton, being the points where the allocated expenses principally occur. I do not know what the allocations for Negaunee
1721 were; if they were common $416, freight $50 and passenger $150, that would settle the allocated expenses at Negaunee but would be too incomplete a basis for any computations for the balance of the road. If it appeared at Ishpeming that the expenses were, common $537, allocated freight $892, passenger $5, that would truly express the relation of the passenger and freight business at that station. I tested out the accuracy of the 12+% passenger by a computation as to the amount of money handled by the freight office and by the passenger office. While that is not proper cost accounting in a large station, the cost of handling a dollar of business of each class and applying that to the total number of dollars handled on the line would give an idea as to what the result would be had they both grown to the point where they could have a freight and passenger man to handle them. If the passenger fare were reduced from three to two cents the ratio would go down. We cannot use the gross earnings basis in any way save as a fact of general confirmation. It is a test only to see if your computations are excessive either way. If I had found that it run down to two or three percent or gone up by 40% or 50% passenger, I would feel that there was something wrong with my computation using 12%+. If one station handled nothing but iron ore or coal and another was a shipping point for furniture there would be no comparable unit which could be arrived at on the amount of money received or handled. My confirmation proves nothing except that for every dollar the agent handled in passenger there was an expense of 2.6¢ and in freight 4¢+. It proves nothing save setting a general test to determine

whether or not you have passed the boundaries of probability, either higher or lower. The division of 376 station supplies and expenses, is dependent on 373 station employees, in part as is 227, re-
1722 pairs to station buildings. The idle time of employees at different stations varies. I presume there is a considerable portion of the time when the men are not busy. At small stations where the agent is not as busy as at a larger station, his compensation is sometimes based upon the importance of his station. Defts.' Ex. 329, p. 246, Accounts 452, Clerks and Attendants in General Offices, 453, General Office Expenses and Supplies: the common portion is assigned on factor 12-15 and 9-15 is a misprint. Those "9" factors are all misprints for "12."

The group "general expenses" were assigned by both Delf and myself as overhead to all other groups and changes made in the other groups would be reflected here. To divide the passenger expenses between inter and intra state I used the passenger miles the same as Delf, except as to station accounts. I assigned station employees to inter and intra on intra factor 1, p. 224, Defts.' Ex. 329. That is on the time of the agent consumed in sale of tickets. I differ from Parker who assigns on the relation of passenger miles and Delf who assigns on the relation of passengers travelling. The effect of my calculation: coupon tickets and simplex (card) was to reduce Delf's ratio from 88.78% intra to 88.07%. To reach my basis (Referring to p. 156, Defts.' Ex. 329, 1916) I had one of my men go to each train for a period of six weeks and with a special watch test the time it took the agent to dispose of a passenger and find out what class of ticket the man was getting. I found it took an average of about ten seconds to handle a simplex or Mineral Range ticket; it took 50 seconds average, to sell a coupon ticket, it being there necessary to punch limits on the side and possibly look up facts with which the agent is not familiar. On coupon tickets, interstate and in-
1723 trastate the average time was about 5.75 times as long as for the card or simplex ticket; I then determined how many simplex tickets were sold in inter and in intra state. I then found how many tickets other than Mineral Range, were sold and multiplied each of the inter and intra coupon ticket sales by 5.75. On the mileage handled by agents I used the same percentage. From the results of these figures I found the elapsed time in seconds to be intra 536,672, inter 75,136, or that intra tickets represented 87.55% of the agent's effort to sell them. On timing sales of sleeping car tickets we found the time selling and making the entry ran about with the coupon ticket, though we made no computation based on this. I have made a separate assignment of expenses to the operation of sleepers and diners including chair and observation, mail and express cars, having shown results separately for sleepers and diners. This is the first case where I have made that assignment though I have always had it in mind. I used it to a limited extent 7 years ago in an express case in Minnesota. That was to get information as to the amount the Wells-Fargo was paying for express service on the St. Paul. This is the first time I have gone into it in detail in a passenger rate case. From my exhibit you could determine the net

revenue from plaintiff's freight business by subtracting my Michigan passenger expenses from my total expenses and apply the balance to the Michigan freight revenue.

My division of revenues and the equipment accounts, between passenger and freight would correspond with those of Mr. Parker sufficiently for comparison.

Redirect examination.

By Mr. Groesbeck:

Page 218, Defts.' Ex. 329: The heading "all tracks" is in error. It was my intention when I first set up this data to add under
1724 the head of "all tracks" the train weights on exclusive freight tracks, which were outside of train and yard switch. We found that a task of considerable magnitude requiring much data and as we did not intend to use it omitted it. Inadvertently I allowed the heading "all tracks" to remain and the heading is misleading as there will be freight movement where there are exclusive freight tracks—could not possibly be the same as common tracks. The figures under that heading included the switching tonnage and do not include any tonnage on the exclusive tracks or in ore movement.

Recross-examination:

The items in the first column on p. 218 are the cars, locomotives and loading of the trains on plaintiff's road as distinguished from the movement of cars and equipment on common track. In addition to the train movement on common track or in train or yard *yard* switching, there would be whatever movements there were over exclusive freight tracks of which there is 12.07 miles main track, 20.87 miles ore spurs, 20.76 industrial spurs, and 116.71 sidings. The freight main track and ore spurs would certainly have a movement which has not been considered in our train or yard switching. The 12.07 miles of main track I obtained from Mr. Parker and it was checked with Mr. Delf. The detail shows 4.23 miles Negaunee to Winthrop Junction; 2 miles Republic Branch, 3.8 Fiborn Quarry branch, 2.3 Bessemer Branch. I do not think the mileage on all these branches is included in the switching miles. It is now my claim that the figures shown in the first column "All Tracks" with the train movement are the total tons of train movement on common track only. Delf's Ex. 204, p. 14, gives the total Michigan freight net tons, one mile as the same. I judge that would represent Mr. Delf's calculated ton miles for the road It does not indicate
1725 a mistake in my exhibit under "Common Tracks;" it may occur from the fact that the computation of Delf's ton miles was from the billing point. If it included the whole amount it would be necessary for us to reduce the tonnage on common track. I claim a train movement on 12.07 miles of exclusive main line track and 21.87 miles of ore spurs as distinguished from switch movement and not fully included in my switching miles. I do not know it to be the fact that the service on the Fiborn Quarry, Bessemer and

Republic Branches is entirely switching. To arrive at the ton miles of yard switching, the tonnage engine miles in the yard were calculated and to that was added 4.8 cars per movement with their average weights, in the method pointed out by Mr. Parker. The average percentage of loaded and empties is taken. The average percentage of load for the switching movement is the average loading of cars on the road. I do not know how Mr. Delf made his computation of ton miles. I took his figures for that.

1726 C. W. HILLMAN, recalled.

Examined by Mr. Groesbeck:

Defts.' Ex. 339, assigns the passenger values, shown on Defts.' Ex. 332, to the different classes of service, 1914-1917. The method of assignment is shown in the column headed "Factor." In account 36 appears the Soo Union Depot all charged to passenger and baggage, though a study might be made whereby we would assign it to different services. The production of the overhead percentage is shown on the lower left hand part of the exhibit. In the division of the passenger and baggage expenses to inter and intra, accounts 17 and 36 are divided on my intra factor 1, as they are both station accounts and divisible on the basis of station services. The balance of the account I divided on intra factor 3, the intrastate passenger mile percentage. The second and each alternate sheet of the exhibit shows the net intrastate passenger return applicable to investment and the percentage of return for fiscal years ending June 30, 1914, 1915, 1916 and 1917, before the payment of taxes which I intend to rework. For 1914 a credit to intrastate passenger and baggage of $422,217 is shown. We have a loss on sleepers for 1914 of $108,145 Parker's Ex. 313, shows the intrastate percentage of sleeping car passenger miles in 1916 as 30.62%; this being the nearest year's percentage, we apply it to the loss for 1914 and at this point absorb 30.62% of the loss on sleepers or $33,114. Our loss on diners at the same point, Defts.' Ex. 329, is $70,990.39, the nearest factor is to assume that the diner service will be proportionate to the men that ride in sleepers, it may or may not be accurate, but it is nearer the proper amount than a passenger mile basis. On that assumption we absorb a loss on diners of $21,737. We must also absorb taxes to get the net result and finding that they amount to 1.7495% for the year, we have $13,995 taxes which would accrue on the passenger and baggage business. The taxes on sleeper and diner property,
1727 assuming 30.62% intra, are also absorbed. Deducting the amounts to be absorbed $74,231 from the $422,217 profit, we have a net profit of $347,986 for 1914. The total value of the intrastate passenger property including passenger and baggage, sleepers and diners, is $1,107,730, upon which the percentage of net return shown is 31.41% or after allowing the loss as computed by Delf, 19.56%. This is after absorbing both the expenses and values of the sleeper and diner service. I suggest this point: that the bulk of the traffic wherein the losses occur is interstate; only 8.8% of

the intrastate passengers out of 23,000,000+ miles, passenger in 1917, used the sleepers and 33+% of the interstate passengers out of 9,800,000 passenger miles used the sleepers, which are the heaviest cars they have and the heaviest expense that is incurred. I believe the South Shore derived the return shown, on the value of the property used in intrastate passenger business, in 1914. Mr. Delf's figure for the value of intrastate passenger property is $2,741,000 this being what the Master found. The difference between my intra passenger and the Master's is due to the difference in method of assignment to passenger and that he uses a different percentage to assign to the intra its proportion of the sleepers and diners. My total valuation is $2,566,054, and my passenger value is $1,107,730, of which I assign approximately one-half to intrastate passenger. The sleeper and diner business are responsible for it as there is no difference in the cost between inter and intra passenger on this road save the slight excess to intrastate on account of the station services. I arrived at the results for subsequent years in the same manner as described for 1914. The results are as follows:

1728

Year.	Total intra valuation.	Net return.	Per cent return.	Per cent return allowing loss.
1914.....	$1,107,730	$397,986	31.41%	19.56%
1915.....	1,174,267	210,454	23.03	12.37
1916.....	1,196,698	288,127	24.07	13.55
1917.....	1,292,659	319,583	24.72	13.13

Referring to the so-called constant costs for 1917, in the expenses charged out on my Ex. 329 to sleepers, diners, mail and express, certain expenses would exist if there was no such business: e. g. to illustrate, Account 201, Superintendence, 202, Road Maintenance, 221, Right of Way Fences. These are examples, my exhibit will set forth each account and the amount.

I furnished Mr. Dadson some data for his exhibit, No. 319. I obtained it from the annual reports of the Company filed with the State (evidently printed reports) containing expenses. I told Mr. Delf I would examine into their capitalization and asked him for the data which the Company had. They had furnished these books for the benefit of the Interstate Commerce men who were examining on this point. I requested Delf to leave the books there, which he did, and I used them while at Marquette. The accounts taken from those printed reports were afterwards checked over by Mr. Dadson in Lansing and minor changes made in them from the sworn reports.

Defts.' Ex. 340 shows the so-called constant operating costs by primary accounts, assigned to sleepers, diners, mail and express, for 1915, 1916, and 1917. They would remain constant even if the sleepers, diners, mail and express had been eliminated from the train consists.

Defts.' Ex. 341, is a statement showing the amount paid employees of the Soo Union Depot for the year ending June 30, 1917. This is taken from the joint accounts and does not appear in the

1728*a* item "Station Employees." Dividing one-half to Soo Line, I find the amount paid passenger employees to be $3,044. It was not included in the allocation of amounts to station employees at the six stations listed from which I obtained a passenger percentage of 12.6. Including it would raise my 1917 passenger percentage to 15.4.

Defts.' Ex. 342 shows the amount of Maintenance of Way and Structures accounts assigned by me on various factors, 1914 to 1917 inclusive.

I have had experience with reference to the effect of a reduction in rate as stimulating business. At least one experience along that line, in the case of Louisville and Nashville v. Florida; the rate was reduced from four to three cents. The railway claimed the traffic had reached the maximum and a reduction in fare would be followed by a reduction in earnings. Before the final hearing of the case, which ran three years with the three-cent rate in operation, the earnings more than doubled. I attribute that both to the growth of the country and the reduction of rate. There has been a steady growth in passenger traffic in Florida during the last decade, though this road is outside the excursion limits or belt. In my opinion, there is stimulation of business where the rate is reduced, though the amount can only be determined by experiment.

1729 W. W. WALKER, recalled, before the Court on Dec. 7, 1917, by plaintiff in rebuttal.

Direct examination.

By Mr. Tracy:

I reside in Duluth; am and have been plaintiff's vice-president and general manager six years. Have been in plaintiff's employ since 1890 in the capacity of travelling freight agent, assistant general freight agent and general freight agent, the latter for 10 years prior to being general manager. The Mineral Range Railroad Co. stock is owned by plaintiff 52% and by Tamarack & Osceola Mining Co. 48%. It is managed by a separate board of directors on which the minority stockholders have large representation. The operating officials are the same as plaintiff's but the accounts are kept separately. The Mineral Range is an old railroad and I understand was in operation prior to the construction of the M. H. & O. to Houghton. The Mineral Range operates, the shore line between Hancock and Lake Linden, and from Gay to Traverse Bay on a leased line. At one time it operated passenger trains between Calumet and Houghton. The building of a trolley line between those places caused them to discontinue the passenger operations. The center of population of Houghton County is Calumet, it being the largest center of population on the South Shore. The trolley line practically destroyed the passenger earning power of the Mineral Range. We were unable to pay operating expenses. We operate on the Shore line now, as there is no trolley from Houghton or Hancock to Lake Linden and we must furnish the service. The plaintiff commenced

operating its train on the Mineral Range to Calumet prior to 1911—10 or 12 years ago. The reason for its doing so was that to secure business for our line we had to go where it originated; we used through trains where the volume of business was the largest. Train No. 2, Calumet to St. Ignace is started from Calumet and the extra expense of the Mineral Range run paid as there is a great deal
1730 of business originating at Calumet destined to lower Michigan points and by starting our train there we get it as against its going via Chicago. The competition through Chicago for any line is very great. People want to go through there; unless there is an attractive route by some other line, they will go through Chicago. The Copper Range and C. M. & St. P. run a solid through vestibule train from Calumet to Chicago. The Copper Range is separately owned and not controlled in any way by the plaintiff. The trains between Calumet and St. Ignace are No. 1, going east and No. 2, going west. The same reasons exist for No. 1, going through to Calumet as for No. 2, starting there. Train 16 from Calumet, at night, connecting with 7 and 8 at Nestoria, is operated from Calumet for the same reasons as 1 and 2. There is also a sleeper on that train for Duluth with which we encounter active boat competition during seven months of the year. 16 has one sleeper to Duluth and one to St. Ignace. The St. Ignace sleeper meets competition by way of Chicago. Our train No. 3, starts at Marquette and at Negaunee picks up the C. & N. W. equipment going to Calumet. It is our crew, locomotive and baggage cars and the rest of the equipment is C. & N. W. and Pullman cars maintained by it. Previous to our arrangement with C. & N. W. train 3, operated with our own equipment. 103 is the C. M. & St. P. train, Champion to Calumet, hauled by us, with their equipment, maintained by themselves, with our locomotive and crew. The plaintiff gets the fares on trains 3 and 4 and 103 and 104 and in addition we receive about $14,000 a year rental. It would be impossible to obtain this revenue from either road if our train ran only to Houghton, as the C. & N. W. train was in competition with the C. M. & St. P. road over the Copper Range to Calumet, and both trains must go through to Calu-
1731 met. As a railroad official and manager I feel that it is worth enough for our railroad to go into Calumet to make the arrangement we have by which we run our train through to Calumet over the Mineral Range and allow it to keep the portion of the fare made on its line. The Mineral Range gets the fares on the trains Calumet to Houghton and we receive from both the C. M. & St. P. and C. & N. W. $14,000. We have a similar arrangement on our lines at Marquette with these same railroads. They operate their trains and we get the revenues. The C. & N. W. runs a train of their own with their own crew Negaunee to Marquette in the morning, pay all the expenses of the train's operation and our road gets all the fares. They want to go to Marquette to get the business originating there. Like us they encounter competition. The train originates at Negaunee, goes to Marquette and then comes back and runs to Chicago. The C. M. & St. P. goes to Marquette, ties up there and starts from there in the morning.

As general manager my particular duty is to make money for the railroad and its stockholders. I attempt to get as much revenue as I can. The intrastate freight revenues are as much as we are able to obtain. Starting in March this year we attempted an increase in interstate freight revenues; we filed a tariff to that effect and the I. C. C. suspended it. At the same time we attempted increases in our intrastate freight rates. Under an agreement with the Michigan Railroad Commission we withdrew the tariffs to await the action of the I. C. C. Thy told us if we did not withdraw them they would suspend them.

The statistical miles travelled by sleeping car passengers intrastate 33%, interstate 67%, do not altogether reflect the true conditions of travel on our road from one portion of Michigan to another.
1732 Considerable travel from the Gogebic Range, Hurley and Ironwood to the Marquette Range and the Copper Country, goes out on the C. & N. W. to connect with us at Saxon, making that an interstate journey. They go 15 miles into Wisconsin and come back 15 miles, and that appears in the statistics as an interstate journey. There is much business from points on our line that goes from Michigan to Michigan through Chicago. A considerable amount of the traffic between Marquette Range and Copper Country and Gogebic Range is sleeper travel. A considerable portion of the mileage on passes was that of persons travelling on exchange passes. Our employees travel on other lines on exchange passes on company business and this is not shown in our operating expenses. The amount represented by this would be considerable. I imagine the exchanges we get on other roads would be larger than we give, as we are in an isolated country and all our men who want to go anywhere have to go as far as Detroit or Chicago to get started.

Cross-examination.

By Mr. Carr:

If employees of other roads wish to travel over our road for pleasure, exchange passes permit them to do so without paying fare.

The traffic originating and terminating in Michigan is controlled by interestate rate. Our application for increased freight rates was on the theory that the intrastate freight rates should be increased and to the I. C. C. on the theory that our interstate rates should be increased. The proposition of increasing the interstate freight rates is now pending before the I. C. C. and is not yet determined. The effect of increased freight rates would be an increase in gross earnings. If we get 15% increase of all freight traffic it would give us $450,000 in round numbers. We now consider that insuffi-
1733 cient, we ought to have more. It should be at least 20% on both inter and intrastate freight. The Canadian Pacific controls both the Soo Line and South Shore. The C. & N. W. and C. M. & St. P. trains to the Copper Country are pulled by South Shore locomotives; we use our larger passenger engines on those trains. The C. & N. W. train is made up of a South Shore locomotive and baggage car and C. & N. W. car, coach, reclining chair car,

Pullman car and dining car, making a heavy train. This requires a pusher up L'Anse Hill. Because of the size of these trains the train crew is increased by one flagman. The C. M. & St. P. trains are equally heavy, about of the same consists. The pusher takes the trains from L'Anse to Summit. The sleepers run to Calumet to pick up through traffic to points south. One reason for this is the competition of the Copper Range. The sleeper on #16 for Duluth, we take to Calumet and back because of the water competition to and from Duluth. The C. & N. W. train at Marquette uses all the stational terminal facilities. We get the fares and the rental and keep the tracks and station in repair and our employees then serve the train. When under its own management the Mineral Range independently ran trains from Houghton to Calumet and took care of the local traffic. The interurban line which forced the Mineral Range to take off its passenger trains was built about fifteen years ago. Then the plaintiff proceeded to operate the trains for the reasons given. A large proportion of the passengers Calumet to Houghton are through to other parts of the system; the local people use the traction line.

1734 The respective parties have agreed upon the foregoing statement of the evidence as being a full, true, proper and complete statement thereof, and consent that the same may be approved by the District Judge, not intending, however, to waive the right to have further evidence returned as provided by the rules in case it shall later be found that anything is inadvertently omitted.

ROGER I. WYKES,
Attorney for Appellants.
JOHN E. TRACY,
Attorney for Appellee.

I hereby approve of the foregoing statement of the evidence in this cause as a sufficient compliance with equity rule 75, and direct that the portions thereof included in the exact words of the witnesses be so returned.

C. W. SESSIONS,
District Judge.

Dated October 30", 1918.

Filed Nov. 2, 1918, at — o'clock — M.
ELMER W. VOORHEIS, *Clerk.*

1735 UNITED STATES OF AMERICA,
Eastern District of Michigan, ss:

I, Elmer W. Voorheis, Clerk of the District Court of the United States for the Eastern District of Michigan, do hereby certify that the above and foregoing is a true copy of Volume 4 of Narrative Statement of Testimony on Appeal comprising typewritten pages num-

bered one thousand three hundred and twenty-four to one thousand seven hundred and thirty-four inclusive, in the therein entitled cause as the same appears on file and of record in my office; that I have compared the same with the original, and it is a true and correct transcript therefrom and of the whole thereof.

In testimony whereof, I have hereunto set my hand and affixed the seal of said Court, at Detroit, in said district, this twenty-first day of November, in the year of our Lord one thousand nine hundred and eighteen, and of the Independence of the United States of America the one hundred and forty-third.

[Seal of the U. S. District Court, Eastern District of Mich.]

ELMER W. VOORHEIS, *Clerk.*

1736 UNITED STATES OF AMERICA:

In the Supreme Court.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, Addison A. Keiser, et al., Defendants and Appellants,

vs.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, Plaintiff and Appellee.

It is hereby stipulated and agreed, by and between the above named parties, as follows:

The Clerk shall print so much of the record in said cause as is designated below by the Appellants and the Appellee, respectively.

(Designation by Appellants.)

Bill of Complaint. (Filed July 26, 1911. Docket No. 1.)

Order for Hearing, Application for Interlocutory Injunction, and Temporary Restraining Order. (Filed July 26, 1911. Docket No. 6.)

Answer. (Filed Dec. 2, 1911. Docket No. 21.)

Replication. (Filed Dec. 26, 1911. Docket No. 22.)

Order appointing Special Master. (Filed May 17, 1912. Docket No. 42.)

Opinion on Motion for Preliminary Injunction. (Filed May 29, 1912. Docket No. 45.)

Order continuing Preliminary Injunction conditionally. (Filed May 29, 1912. Docket No. 48.)

1737 Bond of Complainant in pursuance of Order of Court dated May 29, 1912. (Filed June 13, 1912. Docket No. 48.)

Order Continuing Restraining Order. (Filed Jan. 23, 1913. Docket No. 65.)

Memorandum Order in re Deposit in Clerk's Office of Bank Receipts of one-third of Plaintiff's Gross Earnings. (Filed Oct. 25, 1915. Docket No. 78.)

Order regarding Fund to secure Payment of Refund Coupons. (Filed Oct. 29, 1915. Docket No. 80.)

Stipulation as to Certain Exhibits (substituting duplicates, on account of originals missing). (Filed Feb. 1, 1917. Docket No. 337.)

Report of Special Master, Herbert L. Baker. (Filed Feb. 1, 1917. Docket No. 340.)

Defendants' Exceptions to the Report of the Special Master. (Filed Feb. 20, 1917. Docket No. 343.)

Complainant's Exceptions to the Report of the Special Master. (Filed Feb. 26, 1917. Docket No. 344.)

Opinion on Pleadings and Proofs. (Filed Jan. 9, 1918. Docket No. 362.)

Final Decree. (Filed Feb. 14, 1918. Docket No. 368.)

Petition for, and Allowance of, Appeal, and Assignment of Errors. (Filed March 6, 1918. Docket No. 369.)

Citation, with Acceptance of Service. (Filed —— —, 1918. Docket No. —.)

Motion and Order enlarging Time for docketing Appeal and filing Record on Appeal, and Second Citation, with Acceptance of Service. (Filed —— —, 1918. Docket No. —.)

Motion and Order of Sept. 13, 1918, extending Time for docketing the Appeal and returning the Record.

Stipulation re Exhibits, dated Sept. 16, 1918.

1738 Statement by the Defendants and Appellants for the Purpose of limiting the Record on Appeal.

Statement of the Testimony taken before the Special Master and before the District Court and returned to this Court, together with the stipulations of counsel and the orders of the District Court regarding the Testimony and Exhibits to be returned. The marginal record pages found opposite the testimony were inserted for the convenience of counsel and need not be printed.

The Præcipe directing the Return of the Pleadings, Testimony and Exhibits by the Clerk of the District Court.

A sufficient number of the printed comparison of valuation exhibits (Complaniant's 1, 1*a* and 40 and Defendants' 15) have been printed so that the Clerk will be furnished with the requisite number. The report of the Special Master, Plaintiff's Exhibits 201 to 210 inclusive, and Defendants' Exhibits 325 and 329 have been printed, and the requisite number of printed copies for use in making up the record will be furnished to the Clerk.

(Designation by Appellee.)

Plaintiff's Exhibits 33, 35, 36, 43, 52, 53, 54, 55, Sheets 5, 7, 11 and 14 of Plaintiff's Exhibit 67, Plaintiff's Exhibits 68, 201*a*, 201*b*, 201*c*, 220 and 221.

It is also stipulated and agreed that, instead of printing the Exhibits mentioned above as designated by the Appellee, the Clerk may, if the Appellants shall so direct and the same shall be satisfactory to the Court, cause said Exhibits to be reproduced by the photographic process.

Dated March 20, 1919.

ALEX. J. GROESBECK,
LELAND W. CARR,
Attorneys for Defendants and Appellants.
WM. D. McHUGH AND
JOHN E. TRACY,
Attorneys for Plaintiff and Appellee.

1739 [Endorsed:] File No. 26,845. Supreme Court U. S., October Term, 1918. Term No. 759. Alex. J. Groesbeck et al., Appellants, vs. Duluth, South Shore & Atlantic Ry. Co. Stipulation in regard to printing record. Filed April 7, 1919.

1740 COMPLT.'s EX. No. 33, DELF, OCT. 4", 1912.

Filed February 1, 1917, at — o'clock — M. Elmer W. Voorheis, Clerk, by Carrie Davison, Deputy-Clerk.

4117.

Duluth, South Shore & Atlantic Railway Company.

Statement of Revenue Train Mileage, Year Ending June 30th 1910.

	Mich.	Wis.	Minn.	Total.
Freight Train Miles.....	897,790	176,995	....	1,074,785
Mixed " "	13,113	.....	....	13,113
Mixed " "	13,113	.....	....	13,113
Special Service Train Miles	1,358	.....	....	1,358
Total	1,659,246	324,061	3,659	1,986,966
Per cent	83.51	16.31	.18	100.00

1741 Duluth, South Shore & Atlantic Railway Company.

Statement of Freight Train Mileage, Including Proportion of Mixed and Special Service Train Miles, Year Ending June 30th, 1910.

	Mich.	Wis.	Minn.	Total.
Freight Train Miles.....	897,790	176,995	....	1,074,785
Mixed " " (75%)	9,835	.....	....	9,835
Total	907,625	176,995	....	1,084,620
Per cent	83.68	16.32	....	100.00

Statement of Passenger Train Mileage, Including Proportion of Mixed and Special Service Train Miles, Year Ending June 30th, 1910.

	Mich.	Wis.	Minn.	Total.
Passenger Train Miles.....	746,985	147,066	3,659	897,710
Mixed " " (25%)	3,278	.....	....	3,278
Special Service Train Miles Passenger	1,358	.....	....	1,358
Total	751,621	147,066	3,659	902,346
Per cent	83.30	16.30	.40	100.00

1742 Duluth, South Shore & Atlantic Railway Company.

Statement of Passenger Proportion of Michigan Revenue Train Mileage, Year Ending June 30th, 1910.

	Total Michigan revenue train mileage.		Passenger proportion of Michigan revenue train mileage.
Freight Train Miles.....	897,790		.....
Passenger " "	746,985		746,984
Mixed " "	13,113	25%	3,278
Special Service Train Miles.....	1,358		.....
Total	1,659,246		750,263
Per cent	100.00		45.22

1743 Duluth, South Shore & Atlantic Railway Company.

Statement of Revenue Train Mileage, Year Ending June 30th, 1911.

Entire Line.

	Mich.	Wis.	Minn.	Total.
Freight Train Miles.....	818,325	183,538	....	1,001,863
Passenger " "	764,277	149,738	3,544	917,559
Mixed " "	90	.....	....	90
Special Service Train Miles	2,668	411	3	3,082
Total	1,585,360	333,687	3,547	1,922,594
Per cent	82.46	17.36	.18	100.00

1744 Duluth, South Shore & Atlantic Railway Company.

Statement of Freight Train Mileage, Including Proportion of Mixed and Special Service Train Miles, Year Ending June 30th, 1911.

Entire Line.

	Mich.	Wis.	Minn.	Total.
Freight Train Miles.....	818,325	183,538	....	1,001,863
Mixed " " (75%)	67	.....	....	67
Special Service Train Miles				
Freight	313	.....	....	313
Mixed (75%)	1,195	225	....	1,420
Total	819,900	183,763	....	1,003,663
Per cent	81.69	18.31	....	100.00

Statement of Passenger Train Mileage, Including Proportion of Mixed and Special Service Train Miles, Year Ending June 30th, 1911.

Entire Line.

	Mich.	Wis.	Minn.	Total.
Passenger Train Miles.....	764,277	149,738	3,544	917,559
Mixed " " (25%)	23	.....	....	23
Special Service Train Miles				
Passenger	762	111	3	876
Mixed (25%)	398	75	....	473
Total	765,460	149,924	3,547	918,931
Per cent	83.30	16.31	.39	100.00

1745 Duluth, South Shore & Atlantic Railway Company.

Statement of Passenger Proportion of Michigan Revenue Train Mileage, Year Ending June 30th, 1911.

Michigan.

	Total Michigan revenue train mileage.		Passenger proportion of Michigan revenue train mileage.
Freight Train Miles.....	818,325		.....
Passenger " "	764,277		764,277
Mixed " "	90	25%	23
Special Service Train Miles			
Freight	313		.....
Passenger	762		762
Mixed	1,593	25%	398
Total	1,585,360		765,460
Per cent	100.00		48.28

1746 Duluth, South Shore & Atlantic Railway Company.

Statement of Revenue Train Mileage, Year Ending June 30th, 1912.

Entire Line.

	Mich.	Wis.	Minn.	Total.
Freight Train Miles.....	799,990	181,350	....	981,340
Passenger " "	732,293	152,605	3,426	888,324
Special Service Train Miles	2,904	422	5	3,331
Total	1,535,187	334,377	3,431	1,872,995
Per cent	81.97	17.85	.18	100.00

1747 Duluth, South Shore & Atlantic Railway Company.

Statement of Freight Train Mileage, Including Proportion of Mixed and Special Service Train Miles, Year Ending June 30th, 1912.

Entire Line.

	Mich.	Wis.	Minn.	Total.
Freight Train Miles.....	799,990	181,350	....	981,340
Special Service Train Miles				
Freight	448	.....	....	448
Mixed (75%)	921	14	....	935
Total	801,359	181,364	....	982,723
Per cent	81.54	18.46	....	100.00

Statement of Passenger Train Mileage, Including Proportion of Mixed and Special Service Train Miles, Year Ending June 30th, 1912.

Entire Line.

	Mich.	Wis.	Minn.	Total.
Passenger Train Miles.....	732,293	152,605	3,426	888,324
Special Service Train Miles				
Passenger	1,228	404	5	1,637
Mixed (25%)	307	4	....	311
Total	733,828	153,013	3,431	890,272
Per cent	82.43	17.19	.38	100.00

1748 Duluth, South Shore & Atlantic Railway Company.

Statement of Passenger Proportion of Michigan Revenue Train Mileage, Year Ending June 30th, 1912.

Michigan.

	Total Michigan revenue train mileage.		Passenger proportion of Michigan revenue train mileage.
Freight Train Miles.....	799,990		.....
Passenger " "	732,293		732,293
Special Service "			
Freight	448		.....
Passenger	1,282		1,228
Mixed	1,228	25%	307
Total	1,535,187		733,828
Per cent	100.00		47.80

1749 COMPLT.'S EX. No. 35, DELF, OCT. 4, '12.

Filed February 1, 1917, at — o'clock, —. M. Elmer W. Voorheis, Clerk, by Carrie Davison, Deputy Clerk.

4117.

Duluth, South Shore & Atlantic Railway Company.

Operating Revenues, Year Ended June 30th, 1910.

	Entire line.	Michigan.	
Freight Rev.	2,138,750.60	1,906,529.05	
Switching "	17,203.18	14,955.10	
Misc. Frt. "	2,318.58	2,102.22	
Storage "	80.96	80.96	
Car Service	2,262.50	2,045.25	
	2,160,615.82	1,925,712.58	= 66.99%
Pass. Train Rev.	1,115,922.80	947,817.04	
Spl. " "	705.50	705.50	
Station & Train Privileges	524.20	436.49	
Storage—Baggage	23.95	23.95	
	1,117,176.45	948,982.98	= 33.01%
Telegraph Serv. Rev.	520.84	486.35	
Rents of Bldg. etc.	8,469.15	8,165.65	
Miscellaneous	4,845.96	4,842.12	
	13,835.95	13,494.12	
Joint Facilities—Dr.	26.00*	26.00*	
" " —Cr.	10,544.81	8,438.82	
	10,518.81	8,412.82	
	3,302,147.03	2,896,602.50	

[*In red in copy.]

1750 Duluth, South Shore & Atlantic Railway Company.

Operating Revenues, Year Ended June 30th, 1911.

	Entire line.	Michigan.	
Freight Rev.	2,012,584.00	1,765,815.20	
Switching "	13,774.68	11,098.38	
Misc. Frt. "	2,318.83	2,191.17	
Spl. Train "	3,299.61	2,835.58	
Storage "	173.76	161.30	
Car Service	2,689.40	2,370.15	
	2,034,840.28	1,784,471.78	= 65.77%
Pass. Train Rev.	1,085,777.18	926,681.87	
Spl. " "	2,032.43	1,692.41	
Station & Train Privileges	675.85	562.84	
Storage—Baggage	37.95	37.95	
	1,088,523.41	928,975.07	= 34.23%
			100.
Telegraph Serv. Rev.	598.98	526.94	
Rents of Bldgs. etc.....	9,543.05	9,262.60	
Miscellaneous	4,772.82	4,736.87	
	14,914.85	14,526.41	
Joint Facilities—Dr.	24.00*	24.00*	
" " —Cr.	10,563.62	8,932.77	
	10,539.62	8,908.77	
	3,148,818.16	2,736,882.03	

[*In red in copy.]

1751 Duluth, South Shore & Atlantic Railway Company.

Operating Revenues, Year Ended June 30th, 1912.

	Entire line.	Michigan.	
Freight Revenue	2,061,096.00	1,829,175.98	
Switching "	10,716.26	8,390.59	
Miscl. Freight Revenue ..	3,254.40	3,114.75	
Special Train " ..	2,889.50	2,864.30	
Storage—Freight " ..	112.25	110.83	
Car Service " ..	3,785.60	3,562.10	
Total Freight Revenue	2,081,854.01	1,847,218.55	= 67.06%
Pass. Service Train Revenue	1,044,809.06	903,986.02	
Special Service Train Revenue	3,088.00	2,701.37	
Station & Train Priveleges	600.00	494.54	
Storage—Baggage	23.75	23.75	
Total Passenger Revenue	1,048,520.81	907,205.68	= 32.94%
			100.
Telegraph Serv. Revenue	620.72	610.14	
Rents of Bldgs. & Other Prop.	8,967.05	8,638.55	
Miscellaneous	4,618.26	4,568.38	
Total	14,206.03	13,817.07	
Joint Facilities—Dr.	24.00*	24.00*	
" " —Cr.	7,918.18	6,640.13	
	7,894.18	6,616.13	
Total Operating Revenue	3,152,475.03	2,774,857.43	

[*In red in copy.]

Filed February 1, 1917, at — o'clock — M. Elmer W. Voorheis, Clerk, by Carrie Davison, Deputy Clerk.

4117.

Duluth, South Shore & Atlantic Railway Company.

Operating Revenue, Year Ended June 30th, 1910.—Michigan.

	Total.	Assigned to— Freight.	Passenger.
Freight Revenue	1,906,529.05	1,906,529.05	
Switching "	14,955.10	14,955.10	
Misc. Frt. "	2,102.22	2,102.22	
Storage—Frt. "	80.96	80.96	
Car Service	2,045.25	2,045.25	
		1,925,712.58 = 66.99%	
Pass. Train Rev.	947,817.04	.....	947,817.04
Special Train Rev.	705.50	.....	705.50
Station & Train Priv.	436.49	.....	436.49
Storage Baggage	23.95	.....	23.95
Total Frt. & Pass. Rev.	2,874,695.56	.....	948,982.98 = 33.01%
Telegraph Serv. Rev.	486.35		
Rents of Bldgs. etc.	8,165.65		
Miscellaneous	4,842.12		
Joint Facil. (Bal.)	8,412.82		
Frt. 66.99%. Pass. 33.01%.	21,906.94	14,675.46	7,231.48
Total Operating Revenue	2,896,602.50	1,940,388.04	956,214.46

THIS PAG

Duluth, South Shore & Atlantic Railway Company.

Operating Revenues, Year Ending June 30th, 1911.

Michigan.

	Total.	Assigned to— Freight.		Passenger.	
Freight Revenue	1,765,815.20	1,765,815.20			
Switching "	11,098.38	11,098.38			
Misc. Freight Revenue	2,191.17	2,191.17			
Special Train "	2,835.58	2,835.58			
Storage "	161.30	161.30			
Car Service "	2,370.15	2,270.15			
		1,784,471.78	(65.77%)		
Passenger Train Revenue	926,681.87	.....		926,681.87	
Special " "	1,692.41	.....		1,692.41	
Station & Train Privileges	562.84	.....		562.84	
Storage—Baggage	37.95	.....		37.95	
Total Frt. & Passr. Rev.	2,713,446.85			928,975.07	(34.23%)
Telegraph Serv. Revenue	526.94				
Rents of Bldgs., etc.	9,262.60				
Miscellaneous	4,736.87				
Joint Facilities (Bal.)	8,908.77				
Frt. 6577%—Pass. 34.23%.	23,435.18	15,413.32		8,021.86	
Total Operating Revenue	2,736,882.03	1,799,885.80		936,996.93	

Operating Revenues, Year Ended June 30th, 1912.

Michigan.

	Total.	Assigned to— Freight.	Passenger.
Freight Revenue	1,829,175.98	1,829,175.98	
Switching "	8,390.59	8,390.59	
Misc. Frt. "	3,114.75	3,114.75	
Storage—Frt.	110.83	110.83	
Car Service	3,562.10	3,562.10	
Special Train Rev.	2,864.30	2,864.30	
		1,847,218.55 = 67.06%	
Pass. Train Rev.	903,986.02	.....	903,986.02
Special Train Rev.	2,701.37	.....	2,701.37
Station & Train Priv.	494.54	.....	494.54
Storage Baggage	23.75	.....	23.75
Total Frt. & Pass. Rev.	2,754,424.23		907,205.68 = 32.94%
Telegraph Serv. Rev.	610.14		
Rents of Bldgs., etc.	8,638.55		
Miscellaneous	4,568.38		
Joint Facil. Bal.	6,616.13		
Frt. 67.06%. Pass. 32.94%.	20,433.20	13,702.51	6,730.69
Total Operating Revenue	2,774,857.43	1,860,921.06	913,936.37

THIS PAGE BOUND VERTICAL IN BOOK

1755 COMPLT.'s EX. No. 43, DELF, OCT. 8", 1912.

Filed February 1, 1917, at — o'clock —. M. Elmer W. Voorheis, Clerk, by Carrie Davison, Deputy Clerk.

4117.

Duluth, South Shore & Atlantic Railway Co.

In Michigan.

	Number of passengers.	Passengers one mile.	Average haul.	Rate per pass. per mile.
1902	527,548	27,730,780	52.57	.02760
1903	588,289	29,579,008	50.28	.02840
1904	553,546	27,415,002	49.53	.02815
1905	509,857	26,401,713	51.78	.02762
1906	567,520	28,697,476	50.57	.02825
1907	630,542	33,256,965	52.74	.02785
1908	619,850	32,438,206	52.33	.02590
1909	640,718	31,145,196	48.61	.02541
1910	689,503	32,813,258	47.59	.02543
1911	715,081	32,677,027	45.70	.02519
1912	717,769	31,574,678	43.99	.02551
Intrastate.				
1910	588,745	18,358,957	31.18	.02563
1911	621,628	19,645,802	31.60	.02558
1912	628,593	20,090,114	31.96	.02604
Interstate.				
1910	100,758	14,454,301	143.46	.02518
1911	93,453	13,031,225	139.44	.02460
1912	89,176	11,484,564	128.79	.02458

1756 Duluth, South Shore & Atlantic Railway Co.

Entire Line.

	Number of passengers.	Passengers one mile.	Average haul.	Rate per pass. per mile.
1902	581,668	32,816,802	56.42	.02692
1903	641,210	35,327,390	55.10	.02733
1904	603,308	33,388,599	55.34	.02654
1905	554,093	31,019,854	55.98	.02673
1906	618,337	34,413,938	55.66	.02694
1907	691,585	40,284,349	58.25	.02662
1908	679,253	39,627,046	58.34	.02446
1909	707,653	37,924,125	53.59	.02413
1910	719,169	40,128,377	55.80	.02463
1911	785,622	39,484,915	50.26	.02452
1912	790,239	37,653,013	47.65	.02469

COMPLT.'s EX. No. 52, DELF, JAN. 8", 1913. D. L.

Filed Feby. 1, 1917, at — o'clock -- M. Elmer W. Voorheis, Clerk.

4117.

Ex. 52.

Duluth, South Shore & Atlantic Railway Co. in Michigan.

Estimated Loss by Application of Act 276.

Year 1910.

	Intrastate.	Interstate.	Total.
Amount that could be obtained under a Two Cent Rate, except on fares of five miles or less and certain fares via Negaunee and Champion included herein on which more than two cents could be obtained as shown below:			
Adults 2¢ per mile	$359,491.18	$282,518.58	$642,009.76
Children 1¢ " "	3,843.98	3,283.72	7,127.70
	$363,335.16	$285,802.30	$649,137.46
Add:			
Amount in excess of 2¢ per mile that could be obtained from fares of five miles or less	1,650.52	.....	1,650.52
Amount in excess of 2¢ per mile that could be obtained on certain business via Negaunee and Champion	89.68	5,269.08	5,358.76
Total	$365,075.36	$291,071.38	$656,146.74
Amount that was received under Three Cent Rate	470,580.29	363,949.87	834,530.16
Loss 1910	$105,504.93	$72,878.49	$178,383.42

THIS PA

Estimated Loss by Application of Act 276.

Year 1911.

	Intrastate.	Interstate.	Total.
Amount that could be obtained under a Two Cent Rate, except on fares of five miles or less and certain fares via Negaunee and Champion included herein on which more than two cents could be obtained, as shown below:			
Adults 2¢ per mile	$385,233.62	$253,962.68	$639,196.30
Children 1¢ " "	3,841.21	3,330.91	7,172.12
	$389,074.83	$257,293.59	$646,368.42
Add:			
Amount in excess of 2¢ per mile that could be obtained from fares of five miles or less	2,017.56	.....	2,017.56
Amount in excess of 2¢ per mile that could be obtained on certain business via Negaunee and Champion	125.59	4,090.13	4,215.72
Total	$391,217.98	$261,383.72	$652,601.70
Amount that was received under Three Cent Rate	502,511.08	320,614.73	823,125.81
Loss 1911	$111,293.10	$59,231.01	$170,524.11

1759 Duluth, South Shore & Atlantic Railway Co. in Michigan.

Estimated Loss by Application of Act 276.

Year 1912.

	Intrastate.	Interstate.	Total.
Amount that could be obtained under a Two Cent Rate, except on fares of five miles or less and certain fares via Negaunee and Champion included herein on which more than two cents could be obtained, as shown below:			
Adults 2¢ per mile	$394,449.98	$223,860.66	$618,310.64
Children 1¢ " "	3,676.15	2,915.31	6,591.46
	$398,126.13	$226,775.97	$624,902.10
Add:			
Amount in excess of 2¢ per mile that could be obtained from fares of five miles or less	1,825.78	.....	1,825.78
Amount in excess of 2¢ per mile that could be obtained on certain business via Negaunee and Champion	96.71	4,396.70	4,493.50
Total	$400,048.62	$231,172.76	$631,221.38
Amount that was received under Three Cent Rate	523,146.59	282,385.90	805,532.49
Loss 1912	$123,097.97	$51,213.14	$174,311.11

Passenger Traffic in Michigan Divided as Between Adults & Children.

		Intrastate.	Interstate.	Total.
Year 1910:				
Number of Passengers:	Adults	575,467	98,623	674,090
" "	Children	13,278	2,135	15,413
" "	Total	588,745	100,758	689,503
Passengers One Mile:	Adults	17,974,559	14,125,929	32,100,488
" one mile:	Children	384,398	328,372	712,770
" " "	Total	18,358,957	14,454,301	32,813,258
Revenue:	Adults	$465,430.72	$360,072.44	$825,503.16
"	Children	5,149.57	3,877.43	9,027.00
"	Total	$470,580.29	$363,949.87	$834,530.16
Year 1911:				
Number of Passengers:	Adults	608,292	91,226	699,518
" "	Children	13,336	2,227	15,563
" "	Total	621,628	93,453	715,081
Passengers One Mile:	Adults	19,261,681	12,698,134	31,959,815
" " "	Children	384,121	333,091	717,212
" " "	Total	19,645,802	13,031,225	32,677,027

Duluth, South Shore & Atlantic Railway Co.

Passenger Traffic in Michigan Divided as Between Adults & Children.—Continued.

	Intrastate.	Interstate.	Total.
Revenue: Adults	$497,305.04	$316,656.86	$813,961.90
" Children	5,206.04	3,957.87	9,163.91
" Total	$502,511.08	$320,614.73	$823,125.81
Year 1912:			
Number of Passengers: Adults	618,483	87,451	705,934
" passengers: Children	10,110	1,725	11,835
" " Total	628,593	89,176	717,769
Passengers One Mile: Adults	19,722,499	11,193,033	30,915,532
" one mile: Children	367,615	291,531	659,146
" " " Total	20,090,114	11,484,564	31,574,678
Revenue: Adults	$517,924.64	$278,809.93	$796,734.57
" Children	5,221.95	3,575.97	8,797.92
" Total	$523,146.59	$282,385.90	$805,532.49

1761 COMPLT.'s EX. No. 53, DELF, JAN. 8, 1913. D. L. C.

Filed Feby. 1, 1917, at — o'clock —. M. Elmer W. Voorheis, Clerk.

4117.

Ex. 53, Delf.

Duluth, South Shore & Atlantic Railway Company.

Population of the State of Michigan from Census of 1910.

Entire State	2,810,173
Northern Peninsula	325,628
Southern "	2,484,545

Railroad Mileage from Report of the Michigan Railroad Commission 1910, *Pages* 210 *and* 211.

	Entire State.	Northern peninsula.	Southern peninsula.
Main Line Owned	5,720.97	1,491.31	4,229.66
All Tracks "	10,369.38	2,976.65	7,390.73
Total Operated	13,270.76	3,328.53	9,942.23

Population per mile of:	Entire State.	Northern peninsula.	Southern peninsula.
Main Line Owned (1910)	491	218	587
All Tracks " "	271	109	336
Total Operated "	211	98	249

1762 COMPLT.'s EX. No

Duluth, South S

Stateme

Ex. 54.

	Gross earnings.	Operating expenses.	Net earnings.	Oth inc
Year ended Dec. 31, 1887	1,465,689.23	861,730.89	603,958.34	...
1888	1,468,592.16	883,798.06	584,794.10	8,3
1889	1,976,350.38	1,146,876.12	829,474.26	2,8
1890	2,241,097.12	1,422,703.81	818,393.31	1,1
1891	2,160,118.24	1,332,292.34	827,825.90	...
1892	2,249,194.25	1,484,695.20	764,499.05	...
1893	2,078,777.54	1,474,754.88	604,022.66	10,1
1894	1,670,987.00	1,094,238.81	576,748.19	3,7
1895	1,811,823.03	1,121,503.33	690,319.70	55,0
1896	1,905,810.53	1,234,679.67	671,130.86	32,4
1897	1,591,114.88	1,064,723.70	526,391.18	20,6
1898	1,821,807.59	1,224,045.79	597,761.80	5,4
1899	2,407,437.39	1,468,896.17	938,541.22	4,9
1900	2,557,973.46	1,628,839.21	929,134.25	5,4
Jan. 1st to June 30, 1901	1,168,524.26	790,821.51	377,702.75	4,0
Year ended June 30, 1902	2,690,569.36	1,688,818.38	1,001,750.98	6,2
1903	2,772,134.67	1,758,089.74	1,014,044.93	14,6
1904	2,524,612.07	1,749,456.12	775,155.95	11,4
1905	2,706,936.02	1,852,705.09	854,230.93	15,6
1906	3,057,775.40	2,057,459.76	1,000,315.64	9,1
1907	3,311,878.06	2,320,857.89	991,020.17	8,9
1908‡	2,986,958.38x	2,252,786.68	734,171.70	30,4
1909‡	2,785,586.83x	2,037,900.83	747,686.00	146,2
1910‡	3,372,089.65x	2,330,599.63	1,041,490.02	50,6
1911‡	3,219,861.55x	2,330,955.87	888,905.68	249,5
1912‡	3,224,906.58x	2,464,234.01	760,672.57	39,2
	61,228,605.63	41,078,463.49	20,150,142.14	736,3

‡Includes revenue from Sleeping and Dining Cars.
x " expenses of Sleeping and Dining Cars.
[*In red in copy.]

[Endorsed:] 4117. Filed Feby. 1, 1917, at — o'clock —

DELF, JAN. 8", 1913.

& Atlantic Ry. Co.

Operations.

Ex. 54.

Total income.	Taxes accrued.	Interest on bonds.	Other deductions from income.	Profit or loss.
603,958.34	31,091.57	265,758.07	175,919.68	131,189.02
366,100.43	36,158.48	440,072.00	196,707.31	79,837.36*
852,312.26	36,956.25	519,352.00	329,670.57	53,666.56*
819,551.31	43,844.95	519,012.00	313,417.86	56,723.50*
827,825.90	44,825.90	516,932.00	253,692.62	12,375.38
764,499.05	44,569.61	671,704.54	165,716.63	117,491.53*
614,158.17	42,846.18	870,166.66	.....	298,854.67*
580,535.67	44,024.97	868,000.00	2,950.10	334,439.40*
745,395.70	35,001.65	806,385.00	26,735.86	183,326.81*
703,533.06	38,462.47	861,098.34	856.47	196,884.22*
546,998.74	41,031.71	860,168.33	7,953.78	362,155.08*
603,179.71	41,754.84	859,616.67	.....	298,191.80*
943,478.53	53,653.43	859,700.00	16,067.66	14,057.44
834,580.70	78,990.27	859,700.00	.....	4,109.57*
781,753.18	80,344.42	429,850.00	393.45	128,834.69*
008,036.20	128,008.92	859,700.00	.....	20,327.28
028,710.13	200,213.67	859,700.00	2,647.00	33,850.54*
786,639.91	210,391.07	859,700.00	.....	283,451.16*
869,881.28	216,733.73	859,700.00	.....	206,552.45*
009,428.52	292,471.22	859,700.00	13,593.40	156,336.10*
999,950.65	170,282.84	859,700.00	25,503.76	55,535.95*
			Dep. 35,539.30	
764,576.92	186,345.24	859,700.00	39,653.56	356,661.18*
			" 28,204.21	
992,894.67	203,599.70	859,700.00	32,418.53	230,027.77*
			" 184,628.63	
992,148.16	225,917.63	859,700.00	173,616.86	351,714.96*
			" 19,340.81	
138,475.37	215,179.79	859,700.00	112,673.78	68,419.01*
			" 41,675.42	
709,911.18	217,417.86	859,700.00	93,352.98	412,235.08*
986,513.74	2,960,718.37	19,724,215.41	2,292,930.23	4,091,350.27*

lmer W. Voorheis, Clerk.

1763 Duluth, South Shore & Atlantic Railway Co.

Statement of Resources and Disposition from Jan. 1st, 1887, to June 30th, 1912.

Resources.

Capital Stock	22,000,000.00
First Mortgage 5% Bonds	4,000,000.00
Consol. " 4% "	15,107,000.00
M. H. & O. Bonds	4,856,700.00
Income Certificates, 4%	3,000,000.00
Car Trust Obligations	2,126,624.73
Total Income	20,886,513.74
Total Resources	71,976,838.47

Disposition.

Road & Equipment	47,182,526.58	
Less Reserve for Accrued Depreciation	420,217.42	
		46,762,309.16
Investments		1,423,154.84
Paid Interest on Bonds		12,631,201.90
" Interest on Unfunded Debt, Car Trusts & Miscel. Int.		892,869.58
" Rents		192,586.32
" Taxes		2,853,718.37
" Pro. Exp. Mackinac Trans. Co.		107,066.06
" Dividends on M. H. & O. Pref. Stock		673,176.24
Refund to Mineral Range R. R. Co. account Equipment Rental		48,399.44
Accounts Written Off		37,113.18
Loss on Tracks and Buildings abandoned		29,811.04
Depreciation prior to June 1st, 1907 on Equipment destroyed since that date		309,388.37
First Mortgage 5% Bonds retired		184,000.00
M. H. & O. Bonds retired		3,779,700.00
Car Trust Obligations retired		1,728,411.54
		71,652,906.04

Current Accounts.

Cash on hand		149,193.34	
Material on hand		342,563.35	
Due from Agents & Conductors		102,164.01	
Miscellaneous Accounts Receivable		217,297.89	
Deposits with Trustees of Car Trusts, etc.		28,353.33	
Insurance Paid on Advance		797.50	
		840,369.42	
Unpaid Vouchers and Wages	483,770.81		
Unused Mileage	19,365.66		
Traffic and Car Service Balances, Net	10,293.94		
Miscellaneous Accts. Payable	3,006.58		
		516,436.99	
			323,932.43
Total Disposition			71,976,838.47

1764 Duluth, South Shore & Atlantic Railway Co.

Statement of Investments from Jan. 1st, 1887, to June 30th, 1912.

Mackinac Transportation Co.			237,371.70
Sault Ste. Marie Bridge Co.			250.00
Lake Superior Terminal & Transfer Ry. Co.—			
Stock		70,800.00	
Advances		8,300.00	
			79,100.00
Mineral Range R. R. Stock			751,995.00
Sainte Marie Union Depot Co.—			
Stock		37,500.00	
Advances		21,279.86	
			58,779.86
South Shore Land Co. Stock			3,000.00
Mineral Range R. R. Equip. Notes			198,754.61
Duluth Board of Trade Membership			70.00
Other Properties:			
Rails and Fastenings loaned to—			
Edw. Hines Lumber Co.			25,824.02
Holt Lumber Co.			17,451.79
Lake Sup. Iron & Chemical Co.			28,977.84
Claussen Bros.			924.21
Gladstone Lots			10,130.00
House & Lot, Ridge St., Marquette, Mich.			6,900.00
Miscellaneous			3,625.81
Total			1,423,154.84

1765 COMPLT.'S EX. No. 55, DELF, JAN. 8", 1913. D. L. C.

Filed Feby. 1, 1917, at — o'clock — M. Elmer Voorheis, Clerk.

Ex. 55.

4117.

Five-year View of Railroad Income per Mile.

	Gross operating income (taxes not out), 1908–1912.	Net operating income (taxes not out), 1908–1912.	Av. mileage operated, 1908–1912.
C. & N. W. Ry.....	9,144.00	2,841.00	7,695
C. M. & St. P. Ry.....	8,245.00	2,506.00	7,509
C. R. I. & P. Ry.....	7,939.00	2,236.00	8,020
C. St. P. M. & O. Ry...	8,349.00	2,799.00	1,737
Gt. Nor. Ry.....	8,597.00	3,366.00	7,007
Ill. Cent. Ry.....	12,429.00	3,166.00	4,569
No. Pac. Ry.....	11,774.00	4,828.00	5,809
Wabash R. R.....	11,034.00	2,790.00	2,515
D. S. S. & A. Ry.....	5,048.00	1,377.00	606

1766 *Five-Year View of Railroad Operating Expense Ratios.*

	Total operating expense ratios, 1908–1912.	Condg. transf. & traffic exps. ratios, 1908–1912.	Maint. of way & structs. ratios, 1908–1912.	Maint. of equip. ratios, 1908–1912.
C. & N. W. Ry.....	68.78%	41.72%	13.25%	12.12%
C. M. & St. P. Ry..	69.61%	42.17%	12.63%	13.10%
C. R. I. & P. Ry...	71.68%	41.62%	14.50%	12.89%
C. St. P. M. & O. Ry.	66.47%	40.35%	12.24%	11.76%
Gt. Nor. Ry.....	60.84%	30.00%	16.73%	12.33%
Ill. Cent. Ry.....	74.53%	38.46%	12.60%	21.22%
Nor. Pac. Ry.....	59.00%	32.91%	12.75%	11.81%
Wabash R. R.....	74.71%	43.36%	12.23%	16.31%
D. S. S. & A. Ry...	73.01%	41.43%	17.22%	11.58%

Figured on average mileage operated.

1767 COMPLT.'s EX. No. 67, DELF, JAN. 29", 1914.

Filed Feby. 1, 1917, at — o'clock — M. Elmer W. Voorheis, Clerk.

* * * * * * *

Duluth, South Shore & Atlantic Railway.

Statement of Revenue Train Mileage, Year Ending June 30th, 1913.

Entire Line.

	Mich.	Wis.	Minn.	Total.
Freight Train Miles.....	852,914	194,394	....	1,047,308
Passenger " "	760,891	155,517	3,513	919,921
Mixed " "	14,570	.....	....	14,570
Special Service Train Miles	3,115	343	3	3,461
Total	1,631,490	350,254	3,516	1,985,260
Per cent	82.18	17.64	.18	100.00

* * * * * * *

1768 Duluth, South Shore & Atlantic Railway Company.

Statement of Passenger Proportion of Michigan Revenue Train Mileage, Year Ending June 30th, 1913.

Michigan.

	Total Michigan revenue train mileage.		Passenger proportion of Michigan revenue train mileage.
Freight Train Miles.....	852,914		.....
Passenger " "	760,891		760,891
Mixed " "	14,570	25%	3,643
Special Service Train Miles			
Passenger	1,442		1,442
Mixed	1,673	25%	418
Total	1,631,490		766,394
Per cent	100.00		46.98

* * * * * * *

Operating Revenue, Year Ended June 30th, 1913, Michigan.

	Total.	Assigned to— Freight.	Passenger.
Freight Revenue	$1,980,176.94	$1,980,176.94	
Switching "	9,219.77	9,219.77	
Miscellaneous Rreight Revenue	2,225.54	2,225.54	
Miscellaneous (Dockage & Handling Iron Ore)	18,412.32	18,412.32	
Storage—Freight	121.35	121.35	
Car Service	4,435.90	4,435.90	
Special Train Revenue	2,964.29	2,964.29	
		2,017,556.11	
		68.11%	
Passenger Train Revenue	941,015.90	.....	941,015.90
Special Train Revenue	2,970.56	.....	2,970.56
Station & Train Privileges	496.24	.....	496.24
Storage—Baggage	49.20	.....	49.20
Total Freight & Pass. Revenue	2,962,088.01	.....	944,531.90
			31.89%
Telegraph Service Revenue	686.71		
Rents of Buildings, etc.	10,158.50		
Miscellaneous	4,978.34		
Joint Facilities (Balance)	2,894.95		
Freight, 68.11%; Pass., 31.89%.	18,718.50	12,749.17	5,969.33
Total Operating Revenue	2,980,806.51	2,030,305.28	950,501.23

* * * * * * * * * * * * *

1770 Duluth, South Shore & Atlantic Railway Company.

Year Ended June 30th, 1913.

In Michigan.

Number of passengers.	Passengers one mile.	Average haul.	Rate per passenger per mile.
760,252	33,158,849	43.64	.02538
	Intrastate.		
669,350	21,744,820	32.48	.02578
	Interstate.		
90,902	11,414,029	125.56	.02462
	Entire Line.		
842,073	39,528,611	46.94	.02460

* * * * * * *

COMPLAINANT'S EXHIBIT 68, DELF.

Duluth, South Shore & Atlantic Railway Company.

In Michigan.

Estimated Loss by Application of Act 276.

Year 1913.

	Intrastate.	Interstate.	Total.
Amount that could be obtained under a Two Cent Rate, except on fares of five miles or less and certain fares via Negaunee and Champion included herein, on which more than two cents could be obtained, as shown below:			
Adults, 2¢ per mile	$426,379.14	$222,448.04	$648,827.18
Children 1¢ per mile	4,258.63	2,916.27	7,174.90
	$430,637.77	$225,364.31	$656,002.08
Add:			
Amount in excess of 2¢ per mile that could be obtained from fares of five miles or less	1,930.06	.....	1,930.06
Amount in excess of 2¢ per mile that could be obtained on certain business via Negaunee and Champion	180.88	4,885.66	5,066.54
Total	$432,748.71	$230,249.97	$662,998.68
Amount that was received under Three Cent Rate	560,539.36	280,995.40	841,534.76
Loss 1913	127,790.65	$50,745.43	$178,536.08

1772 Duluth, South Shore & Atlantic Railway Company.

Statement of Children's Fares in Michigan, Year Ended June 30th, 1913.

Number of passengers.	Michigan state.	Michigan interstate.	Michigan total.
Cash Fares	2,420	17	2,437
Local Tickets	9,772	307	10,079
D. S. S. & A. Coupon Tickets	1,879	998	2,877
Foreign " "	817	797	1,614
All Tickets	14,888	2,119	17,007

Passengers one mile.	Michigan state.	Michigan interstate.	Michigan total.
Cash fares	49,148	1,783	50,931
Local Tickets	188,187	43,294	231,481
D. S. S. & A. Coupon Tickets	126,689	146,377	273,066
Foreign " "	61,839	100,173	162,012
All Tickets	425,862	291,627	717,490

Revenue.	Michigan state.	Michigan interstate.	Michigan total.
Cash Fares	718.82	27.43	746.25
Local Tickets	2,487.86	509.70	2,997.56
D. S. S. & A. Coupon Tickets	1,773.36	1,675.51	3,448.87
Foreign " "	845.47	1,208.59	2,054.06
All Tickets	5,824.51	3,421.23	9,246.74
Per Pass. Mile	.0137	.0117	.0129
If @ .02¢ per mile	8,517.26	5,832.54	14,349.80
Difference	2,691.75	2,411.31	5,103.36

1773 Duluth, South Shore & Atlantic Railway Company.

Passenger Traffic in Michigan, Year Ended June 30th, 1913.

Statement of Number of Passengers, and Revenue, Traveling Distance of Five Miles or Less.

	No. Pass.	Revenue.
Cash Fares	26,493	$2,558.93
Local Tickets	28,629	3,081.40
Mileage	1,001	103.00
D. S. S. & A. and Foreign Coupon Tkts.	556	46.84
Total	56,679	$5,790.17
One-third =		$1,930.06

Statement of Traffic Interchanged with Connecting Roads at Negaunee and Champion on which More than Two Cents per Passenger Mile Could Be Obtained.

Year 1913.

	Intrastate.	Interstate.	Total.
Number of passengers:			
Full fare	474	12,720	13,194
Half fare	4	274	278
Excess revenue above 2¢ per mile	$180.88	$4,885.66	$5,066.54

(Here follow insert tables 201 A, 201 B, and 201 C, marked pages 1774, 1775, and 1776.)

1777 PLFF. EX. 220. C. S. C.

Duluth, South Shore & Atlantic Ry. Co.

Statement of Operations in Michigan, Year Ended June 30, 1914.

	Total Mich.	Freight.	Passenger.
Total Operating Revenue (Ex. 202, p. 6)	$2,954,875	$1,895,905	$1,058,970
Sleeping Car Revenue (Ex. 206, p. 5)..	30,482	.....	30,482
Dining Car Revenue (Ex. 206, p. 5)...	34,966	.....	34,966
Rents Recd.—Joint Facilities (Ex. 206, p. 5)	10,972	2,579	8,393
Interest	4,987	3,193	1,794
Total Mich. Income.....	$3,036,282	$1,901,677	$1,134,605
Operating Expenses (Ex. 206, p. 4)....	$2,288,975	$1,536,488	$752,487
Sleeping Car Expenses (Ex. 206, p. 5)..	18,540	.....	18,540
Dining Car Expenses (Ex. 206, p. 5)...	44,076	.....	44,076
Rents Paid—Joint Facil. (Ex. 202, p. 11)	9,882	7,503	2,379
Rents Paid Miscel. (Ex. 202, p. 10)....	101	101	.....
Hire of Equip. Dr. Bal. (Ex. 202, p. 10)	28,435	27,163	1,272
Separately Operated Prop. (M. T. Co. Ex. 202, p. 6).....	24,149	24,149	.....
Taxes paid State of Mich. (Ex. 210, p. 12)	204,255	140,875	63,380
	$2,618,413	$1,736,279	$882,134
Net Income, Mich.	$417,869	$165,398	$252,471
Percentage on valuation of 1917.....	2.31%	1.32%	4.53%
Percentage " " of 1913.....	3.00%	1.71%	6.00%
Estimated Loss	196,046	.....	196,046
Net Income after deducting Estimated Loss	$221,823	$165,398	$56,425
Percentage on Val. of 1917.....	1.23%	1.32%	1.01%
" " " " 1913.....	1.60%	1.71%	1.34%

1778

Val. 1917—Frt.	$12,500,644
Pass.	5,569,514
	$18,070,158
Val. 1913—Frt.	$9,695,721
Pass.	4,206,217
	$13,901,938

1779 Duluth, South Shore & Atlantic Ry. Co.

Statement of Operations in Michigan, Year Ended June 30, 1915.

	Total Mich.	Freight.	Passenger.
Total Operating Revenue (Ex. 203, p. 6)	$2,569,095	$1,666,094	$903,001
Rents Recd.:			
Hire of Equipment (Ex. 203, p. 9)	8,027	5,867	2,160
Joint Facilities (Ex. 203, p. 10)	20,914	7,021	13,893
Interest	2,937	1,902	1,035
Total Mich. Income	$2,600,973	$1,680,884	$920,089
Operating Expenses (Ex. 207, p. 4)	$1,962,631	$1,245,380	$717,251
Rents Paid:			
Hire of Equip. (Ex. 203, p. 9)	3,495	1,636	1,859
Joint Facil. (Ex. 203, p. 10)	9,052	7,159	1,893
Miscellaneous (Ex. 203, p. 10)	42	42	.....
Separately Operated Prop. (M. T. Co. Ex. 203, p. 5)	16,048	16,048	.....
Taxes on Sleeping Car Tickets (Ex. 207, p. 5)	77	.....	77
Taxes on Observation Car Tickets (Ex. 207, p. 5)	38	.....	38
Taxes paid State of Mich. (Ex. 210, p. 12)	203,642	140,452	63,190
Total deductions from Income	$2,195,025	$1,410,717	$784,308
Net Income, Mich.	$405,948	$270,167	$135,781
Percentage on Valuation of 1917	2.25%	2.16%	2.44%
Percentage on Valuation of 1913	2.92%	2.79%	3.23%
Estimated Loss	167,535	.....	167,535
Net after deducting Estimated Loss	$238,413	$270,167	*$31,754
Percentage on Valuation of 1917	1.32%	2.16%	0
Percentage on Valuation of 1913	1.72%	2.79%	0

[*In red in copy.]

1780 Duluth, South Shore & Atlantic Ry. Co.

Statement of Operations in Michigan, Year Ended June 30, 1916.

	Total Mich.	Freight.	Passenger.
Total Operating Revenue (Ex. 204, p. 8)	$3,085,411	$2,152,115	$933,296
Rents Received:			
Hire of Equip. (Ex. 204, p. 12)....	14,522	11,494	3,028
Joint Facilities (Ex. 204, p. 12)..	19,171	5,589	13,582
Interest (Excluding Int. from rate case fund)	7,638	5,323	2,315
Total Mich. Income.....	$3,126,742	$2,174,521	$952,221
Operating Expenses (Ex. 208, p. 4)....	$2,0?4,622	$1,401,677	$692,945
Rents Paid:			
Hire of Equip. (Ex. 204, p. 12)....	22,444	20,749	1,695
Joint Facilities (Ex. 204, p. 13)...	10,610	8,644	1,966
Miscellaneous (Ex. 204, p. 12).....	37	37	.....
Miscellaneous Interest	7	5	2
Separately Operated Properties (M. T. Co. Ex. 204, p. 7).....	30,048	30,048	.....
Taxes on Sleeping Car Tickets (Ex. 208, p. 5)	168	.....	168
Taxes on Observation Car Tickets (Ex. 208, p. 5).....	90	.....	90
Taxes paid State of Mich. (Ex. 210, p. 12)	200,963	138,604	62,359
Total Deductions from Income..	$2,358,989	$1,599,764	$759,225
Net Income, Mich.....	$767,753	$574,757	$192,996
Percentage on Valuation of 1917.....	4.25%	4.59%	3.47%
Percentage on Valuation of 1913.....	5.52%	5.93%	4.58%
Estimated Loss	176,641	.....	176,641
Net after deducting Estimated Loss	$591,112	$574,757	$16,355
Percentage on Val. of 1917.....	3.27%	4.59%	.29%
Percentage on Val. of 1913.....	4.25%	5.93%	.39%

1781–2 Duluth, South Shore & Atlantic Ry. Co.

Statement of Operations in Michigan, Year Ended June 30, 1917.

	Total Mich.	Freight.	Passenger.
Total Operating Revenue (Ex. 205, p. 7) 3,553,297			
Less 1,115			
	$3,552,182	$2,505,048	$1,047,134
Rents Recd.:			
Hire of Equip. (Ex. 205, p. 15)....	13,627	10,844	2,783
Joint Facilities (Ex. 205, p. 9)....	17,979	4,815	13,164
Interest (Excluding int. on rate case fund)	5,820	4,101	1,719
Total Mich. Income.....	$3,589,608	$2,524,808	$1,064,800
Operating Expenses (Ex. 209, p. 4)....	$2,541,192	1,750,471	$790,721
Rent Paid:			
Hire of Equip. (Ex. 205, p. 15)....	89,232	87,566	1,666
Joint Facilities (Ex. 205, p. 7)....	11,755	10,090	1,665
Miscellaneous (Ex. 205, p. 9).....	168	168	.....
Miscel. Interest	13	9	4
Separately Operated Properties, (M. T. Co.) (Ex. 205, p. 8).....	27,520	27,520	.....
Taxes on Sleeping Car Tickets (Ex. 209, p. 5)	48	.....	48
Taxes on Observ. Car Tickets (Ex. 209, p. 5)	26	.....	26
Taxes paid State of Mich. (Ex. 210, p. 12)	187,570	129,367	58,203
Total deductions from Income...	$2,857,524	$2,005,191	$852,333
Net Income, Mich.....	$732,084	$519,617	$212,467
Percentage on Valuation of 1917.....	4.05%	4.16%	3.82%
Percentage on Valuation of 1913.....	5.27%	5.36%	5.05%
Estimated Loss	218,234	.....	218,234
Net after deducting Estimated Loss	$513,850	$519,617	*$5,767
Percentage on Val. of 1917.....	2.84%	4.16%	0
Percentage on Val. of 1913.....	3.70%	5.36%	0

[*In red in copy.]

Summary.

Before deduction of loss 1914 Net.....	$417,869	$165,398	$252,471
1915 "	405,948	270,167	135,781
1916 "	767,753	574,757	192,996
1917 "	732,084	519,617	212,467
	$2,323,654	$1,529,939	$793,715
Average 4 years	$580,913	$382,485	$198,428
Percentage on Val. of 1917.....	3.21%	3.06%	3.56%
Percentage on Val. of 1913.....	4.18%	3.95%	4.72%
Total Net—1914 to 1917 Incl.....	$2,323,654	$1,529,939	$793,715
Estimated Loss 1914 to 1917 Incl.....	758,456	.....	758,456
4 Years—Net after Estimated Loss	1,565,198	1,529,939	35,259
Average	$391,299	$382,485	$8,814
Percentage on Val. of 1917.....	2.17%	3.06%	.15%
Percentage on Val. of 1913.....	2.81%	3.95%	.21%

1783 Ex. 221.

Plaintiff's Computations of Rate of Return on Property Valuation.

	1914.	1915.	1916.	1917.
Value of Intrastate property....	$3,006,938	$3,470,498	$3,307,262	$3,935,976
Net Intrastate Passenger Income before deducting estimated loss	170,091	102,544	133,078	138,055
Rate of return	5.66%	2.95%	4.02	3.51%
Net Intrastate Passenger Income after deducting estimated loss	$38,392	Loss 22,636	$7,188	Loss 11,693
Rate of return.....	1.29%	.....	.22%	.....

Endorsed on cover: File No. 26,845. E. Michigan D. C. U. S. Term No. 759. Alex J. Groesbeck, Cassius L. Glasgow, Charles S. Cunningham, and Addison A. Keiser, appellants, vs. Duluth, South Shore & Atlantic Railway Company. Filed December 4th, 1918. File No. 26,845.

United States District Court

EASTERN DISTRICT OF MICHIGAN

SOUTHERN DIVISION, IN EQUITY.

Dossin, South Range & Atlantic Railway Company,

Complainant,

vs.

Former C. C. No. 4117.

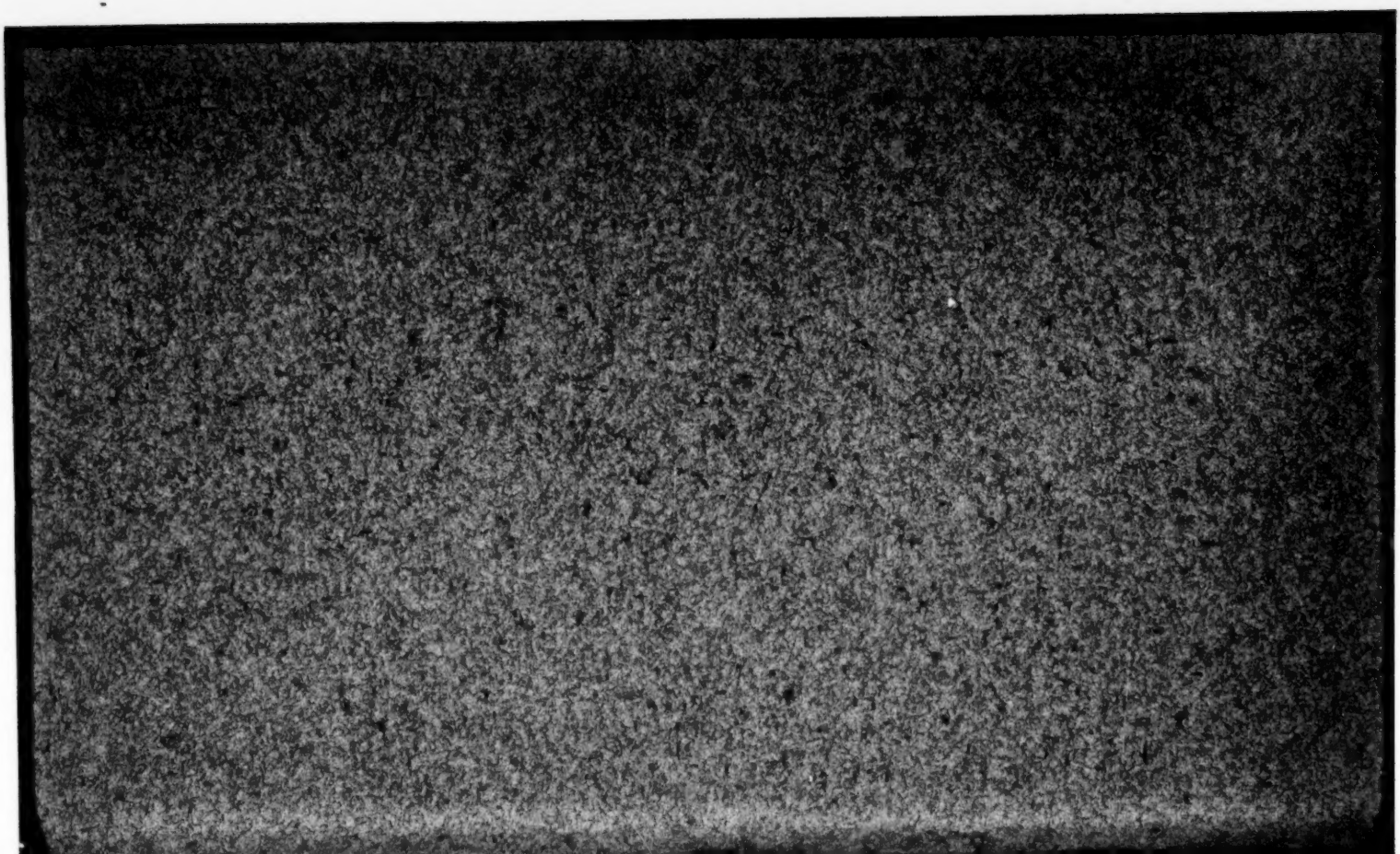
Oscar Marlow, Charles S. Glasgow, Lawton T. Hemans, C. S. Cunningham, et al.,

Defendants.

REPORT OF HERBERT L. BAKER,

Special Master.

(Filed February 1, 1917.)



United States District Court.

EASTERN DISTRICT OF MICHIGAN,

SOUTHERN DIVISION, IN EQUITY.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY,

Complainant,

vs.

Former C. C. No. 4117.

GRANT FELLOWS, CASSIUS S. GLASGOW, LAWTON T. HEMANS, C. S. CUNNINGHAM, ET AL.,

Defendants.

REPORT OF HERBERT L. BAKER,

Special Master.

(Filed February 1, 1917.)

The Bill of Complaint in the case was filed to restrain the operation of, and to relieve the complainant from, compliance with Act 276 of the Public Acts of Michigan, of 1911, which reduced the rates of fare permitted to be charged by railroad companies operating in the Upper Peninsula of Michigan.

The complainant, a corporation organized under the general railroad laws of Michigan, operates a railroad

of approximately four hundred seventy-five miles, crossing the northern peninsula of Michigan from Sault Ste. Marie upon the east to the Wisconsin State Line upon the west, the complainant doing both an intrastate and an interstate business in Michigan.

In 1911, the Michigan Legislature, by the Act complained of, Act 276, reduced the rate of charge for the carriage of passengers for railroad companies operating in the Upper Peninsula from three to two cents per mile for all those companies, the gross earnings of whose passenger trains as reported to the Commissioners of Railroads for 1906 equaled or exceeded $1,200 per mile of road operated; this act permitted three cents per mile to be charged for all distances not exceeding five miles, and also required children under the age of twelve years to be carried at half fare.

The grounds for relief alleged in said bill and made the basis of the prayer to restrain the operation of the statute as applied to the complainant, were the following:

(1) That the act, though applicable in terms to intrastate passenger carriage only, will, by its necessary and direct effect, cause the reduction of interstate passenger fares, for which reason it is unconstitutional, as interfering with interstate commerce. This point has been disposed of adversely to the claim of the complainant in the *Minnesota Rate Cases* and associated cases.

(2) That said act deprives the complainant of its rights of property in violation of the Fourteenth Amendment, in that said rates are unreasonable and inadequate, and therefore confiscate its property.

(3) That the said rates do not afford sufficient or reasonable compensation for the service required to be rendered in consideration thereof.

The answer to the bill upon behalf of the state officials

made defendants, denies practically all the material averments of the bill as to the effect of the Act in question upon interstate business rates, and upon the amount of return which would be permitted to complainant upon its property necessarily engaged and used in carrying on its business and in the several classes or parts thereof.

After the cause was at issue, I was appointed Special Master to take proofs and report thereon. Very extensive records, consisting of 12,000 pages of oral testimony taken and reduced to writing, and many exhibits, were presented by the proofs of the respective parties. Numerous briefs were prepared by respective counsel, and there was an exhaustive oral argument. I then prepared a proposed report and furnished counsel for the respective parties with copies thereof, and stated to them, in substance, that the report was intended to cover everything except the question as to what is required to constitute a sufficient rate of return, which question I reserved for consideration until it should be known whether the rate of return shown by the report would be materially affected by my consideration of the objections which counsel might make thereto. I also further stated to them as follows: "In dealing with such a mass of material and such a multitude of questions, many of which were very perplexing, errors or omissions are almost inevitable, and I am particularly desirous that counsel will call my attention, either by way of objection or otherwise, to everything thought to be erroneous, so that it may be duly considered.

Counsel were requested to serve copy of their objections on opposing counsel.

Thereafter counsel for each party filed objections, as requested, and I then requested that counsel for each side should answer the objections of the other side. Counsel for complainant thereupon answered in detail all

of the objections of counsel for the defendants, excepting only those with reference to which defendants made no argument but stated that they reserved the right to make the objection to the Court. Counsel for the defendants did not answer the objections made by the complainant, but did answer complainant's reply to defendants' objections.

On careful consideration of these objections, I found that some errors had been made in my findings of facts, and also found occasion to change my views with reference to other questions of fact, and in some instances with reference to matters of law, and also found occasion to discuss further some of the more important questions involved. This report embodies the said tentative report with such changes in and additions to the same as were thus found to be required. All such changes and additions are, I believe, fully noted and explained either in my discussion of the various objections or elsewhere. I found it desirable also to make some slight changes in the language of the tentative report for the sake of clearness, and in many instances percentages and other figures are necessarily different. These changes I have not in general noted, because they are of no interest or importance to the Court and they will be readily recognized and understood by counsel. The exhibits which were attached to the tentative report have been revised accordingly.

I have attached to my report the objections of the respective counsel, together with my answers thereto. With reference to such answers, I found it desirable, for the sake of perspicuity, to embody them as far as practicable in the main body of the report and in immediate connection with the subject to which they relate. This I have done, and wherever an answer is so embodied, I have not repeated it in the answers attached, but have

there stated instead where it would be found in the body of the report.

These objections cover substantially the entire case and involve a great many questions, but I have been able to consider those questions fully without the aid of further oral argument by reason of the fact that I have had before me not only the voluminous printed and typewritten briefs submitted by counsel, but also a complete stenographic report of the very full oral arguments heretofore had in the case.

I have embodied in this report a statement of the method adopted for the division of passenger property between the interstate and intrastate services, which statement was inadvertently omitted from the tentative report.

The defendants request me to find, and I so find, that in the determination of this case, the following principles are to be recognized:

(1) The right exists in the state to regulate the rates of public service corporations and of those who devote their property to serving the public. The principle being fixed, the question remaining is, what are the limitations upon it?

Granger case, 94 U. S., 113, 155, 164, 179.
Railroad Commission Cases, 116 U. S., 307.

(2) The authority of the state to regulate rates is not without limitation. That authority is to declare and fix reasonable rates, taking into consideration both the interests of the property owners and the public. The generally expressed and controlling limitation is that vested rights of property cannot be destroyed by the fixing of rates so low as not to be remunerative. In other words, the value of the property cannot be destroyed by

taking away the ability to earn a reasonable return upon it.

Reagan vs. Farmers' Loan & Trust Co., 154 U. S., 362.

Smyth vs. Ames, 169 U. S., 466.

(3) The authority to determine reasonable rates by a state, through its legislature or a regularly constituted commission, is subject to judicial review, to determine whether the return permitted is sufficient, or whether vested property rights are in fact interfered with or destroyed.

Chicago & Grand Trunk vs. Wellman, 143 U. S., 339.

Reagan vs. Farmers' Loan & Trust Co., 154 U. S., 362.

(4) The owner of the property devoted to a public use is entitled to maintain a schedule of rates sufficient to pay a fair and reasonable return upon the value of the property devoted to the public service.

San Diego Land & Town Co. vs. National City, 174 U. S., 739.

Willcox vs. Consolidated Gas Co., 212 U. S. 19.

(5) The value is not dependent upon the original cost of the property, the amount or value of stocks or bonds issued, or the value as influenced by past earnings. The cost of reproduction, allowing for depreciation sufficient to reduce the property to present condition has, in certain cases, been treated as the value.

San Diego Land & Town Co. vs. National City, 74 Fed. 79; 174 U. S. 739.

Smyth vs. Ames, 169 U. S., 466. 546.

San Diego Land & Town Co. vs. Jasper, 189 U. S., 439.

Knoxville vs. Knoxville Water Co., 212 U. S., 1, 9.
Seaboard Air Line vs. Ry. Commission of Alabama, 156 Fed. 792, 806.
Louisville & Nashville Ry. & Light Co. vs. Milwaukee, 87 Fed. 577, 584.
Matthew vs. Board of Corporation Commissioners of North Carolina, 106 Fed. 7.
Railroad & Telephone Companies vs. Board of Equalizers of Tennessee, 85 Fed. 302.
Cotting vs. Kansas City Stock Yards, 183 U. S., 79.

(6) In the case of a property engaged in both interstate and intrastate business, where the question is the sufficiency of the rates under a state regulating statute, the interstate earnings and property must be eliminated and the intrastate rates and earnings applied to the property engaged in that business, to determine the sufficiency of the return.

Smyth vs. Ames, 169 U. S., 466.
Arkansas Rate Cases, 187 Fed. 290.
Minnesota Rate Cases, 230 U. S., 435.

(7) While no fixed rate of return is applicable to all properties, the rule seems to be that the rate of return to which a property is entitled is ordinarily that at which capital will seek investment in properties of similar character in that community or locality.

Shepherd vs. Northern Pacific, 184 Fed. 815.
Willcox vs. Consolidated Gas Co., 212 U. S., 19, 48.
Capital City Gaslight Co. vs. Des Moines, 72 Fed. 829.
San Diego Water Co. vs. San Diego, 118 Cal. 556; 50 Pac. 637.
Spring Valley Water Works vs. San Francisco, 124 Fed. 574.

Central of Georgia vs. Railroad Commission, 161 Fed. 925, 993.

Milwaukee Electric Railway & Light Co. vs. Milwaukee, 87 Fed. 577, 855.

(8) The presumption of reasonableness and sufficiency follows the legislative rate. Before a rate will be set aside as insufficient, it must be proven to be so beyond a reasonable doubt. The presumption of reasonableness can only be overcome by showing that the rates fixed are clearly and palpably in violation of the rights of the owners of property, and are so low as to amount to a confiscation of property through depriving it of the right to a reasonable return. The burden of proof to overcome the presumption of reasonableness is upon the complainant attacking it.

Knoxville Water Co. vs. Knoxville, 12 U. S. 1.

San Diego Land & Town Co. vs. National City, 174 U. S. 739.

(9) The value upon which a return is required to be paid is that at the time the validity at the rates sought to be enforced is in question.

Smyth vs. Ames, 171 U. S., 361, 365.

Willcox vs. Consolidated Gas Co., 212 U. S., 19, 52.

San Diego Land & Town Co. vs. National City, 174 U. S., 739, 757.

(10) Each case must depend upon its own special facts.

Wood vs. Vandalia, 231 U. S., 7.

Minnesota Rate Cases, 230 U. S., 434.

The determination of this case on the record presented involves the consideration and determination of many intricate and complex propositions. Briefly stated, the principal and general propositions, each of which will

allow of considerable separation and under each of which a number of separate questions will arise, may be stated as follows:

(1) The amount and value of the property engaged in the public service business, intrastate in Michigan.

(2) The gross income produced by that business.

(3) The operating expenses and fixed charges to be deducted from that income.

(4) The rate of return furnished by the net income upon the value of that property.

(5) Other questions are raised by the record which involve the determining of:

(a) The proportion of the property engaged in each separate class of the business done by the company; namely, passenger and freight; and the division of that engaged in each, between the interstate and intrastate business.

(b) The gross income arising upon the business of each class, together with the portion of the expenses and charges properly attributable thereto, and the net income therefrom.

As an aid to a fuller understanding of the complainant's status and its relations to the State and to the public which it serves, the following undisputed facts are specifically found:

Incorporation of Complainant, its Railroad and Financial Status.

The complainant is a consolidated railroad corporation duly created in 1887 under the laws of the State of Michigan, has its principal office in the City of Marquette in the State of Michigan, and owns, maintains, and operates lines of railroad in the State of Michigan and

Wisconsin, and, in order to reach Duluth, operates its trains thereto over a line of railroad of another company from the City of Superior, Wisconsin.

As of June 30, 1913, its system of railroad, including its main line and its branches, comprised 601.66 miles of railroad, owned by it, and about 20.83 miles of railroad over which it operated its trains under agreement with other companies, and 491.61 miles thereof are situated within the State of Michigan. Its line extends from Sault Ste. Marie, Michigan, to Duluth, Minnesota, with a branch from Soo Junction in Luce County, Michigan, to St. Ignace, and a branch from Nestoria, in Baraga County, to Houghton, in Houghton County, Michigan, and other short branches in that state.

The whole of said railroad constitutes one system, and long has been, and is now operated as such. Its cars, engines, supplies and appliances are, for the most part, used upon the system wherever required, without regard to state lines. It is impossible to operate separately with due regard to economy or the interests of the public that portion of the system of the complainant situate in any particular state. To a large extent, the trains of the complainant, both freight and passenger, necessarily move between different states, and even when their movements are confined to one state, the same trains and the same cars carry both interstate freight or passengers and intrastate freight or passengers.

Stocks and Bonds Outstanding.

As of June 30, 1913, the complainant had outstanding common stock of the par value of $12,000,000 and preferred stock of the par value of $10,000,000. It also had outstanding first mortgage five per cent bonds of the par value of $3,816,000, and consolidated four per cent mortgage bonds of the par value of $15,107,000, and

in addition covering (as a first lien thereon) its main line from Marquette to Houghton and its branch from Humboldt to Republic, Michigan, with the side tracks and other property appurtenant to such main line and branch line, and constituting about one hundred and four miles of its railroad in Michigan, six per cent mortgage bonds of the par value of $1,077,000. In addition, it had outstanding four percent income certificates of the aggregate par value of $3,000,000 and certain car trust obligations constituting a first lien on certain of its equipment and rolling stock of the par value of $398,213.19.

Book Cost of Railroad.

As of June 30, 1913, the book cost of the entire railroad and equipment of the complainant, exclusive of a reserve fund of $420,217.42, held for accrued depreciation was the sum of $46,767,309.16.

Acquisition by Complainant of Present System.

The railroads comprising the present system of the complainant were acquired by it as follows:

That portion of said railroad extending from St. Ignace to Marquette, Michigan, and which was constructed in 1880 and 1881 and was then generally known as the Detroit, Mackinaw and Marquette Railroad, was purchased from its owners in 1886 by the Mackinaw and Marquette Railroad Company which, with other railroad companies, became in 1887, by consolidation, the complainant.

That portion of the said railroad (partly constructed in 1865, in 1872 and 1883) extending from Marquette to Houghton, and commonly known as the Marquette, Houghton and Ontonagon Railroad (including the certain line of railroad from Marquette to Ishpeming, known as the Marquette and Western Railroad, constructed in

1883, and owned in the same ownership) was purchased by the complainant in 1890.

That portion of said railroad extending from Nestoria, Michigan, to Iron River, Wisconsin, was constructed by a railroad syndicate and purchased by the complainant in 1888.

That portion of said railroad extending from Iron River, Wisconsin, to Superior, Wisconsin, was constructed by the complainant in 1892, and that portion of said railroad extending from Sault Ste. Marie, Michigan, to Soo Junction, Michigan, was constructed by the complainant in 1887.

In acquiring all said railroads, the complainant only received in public lands, 82,385.29 acres, and those were acquired by conveyance from the Marquette, Houghton and Ontonagon Railroad Company. It received as a grant direct from the United States rights of way for 55 miles of its railroad lines in Michigan.

The said Marquette, Houghton and Ontonagon Railroad was bought subject to the six per cent bonds hereinafter described. The outstanding stocks and the other outstanding bonds of the complainant were issued mainly in payment for parts of said railroad and the balance were sold and the proceeds used in the construction of the remainder of the railroad of the complainant.

Entire Operation of Complainant's Railway and Its Financial Results.

From its organization in 1887 to June 30th, 1913, as well as up to the present time, the complainant has never paid any dividends on either its preferred or common stock, or otherwise made any return to the owners of the property upon their investment. For the period commencing with the incorporation of the complainant down to June 30th, 1913, the complainant, after paying

its operating expenses and taxes, has failed to earn enough to pay all the interest on all its outstanding bonds (which for the last twelve years has been $859,700 annually) and is in default on such interest to the extent of $4,624,562,47.

The results in each year of the operation of the complainant's railroad as shown by its books are specifically shown in the following statement of the operations of the complainant from the time of its organization down to June 30, 1913 (the same being Sheet 1 of Complainant's Exhibit 54 Delf.)

Complainant's Exhibit 54—Delf. (Revised by the addition of figures for the year 1913) Sheet 1

Duluth, South Shore & Atlantic Railway Company.

STATEMENT OF OPERATIONS.

	Gross Earnings	Operating Expenses	Net Earnings	Other Income	Total Income	Taxes Accrued	Interest on Bonds	Other Deductions from Income	Profit or Loss
Year ended Dec. 31, 1887..	$ 1,465,689.23	$ 861,730.89	$ 603,958.34		$ 603,958.34	$ 31,091.57	$ 265,758.07	$ 175,919.68	$ 131,189.02
1888.....	1,468,592.16	883,798.06	584,794.10	$ 8,306.33	593,100.43	36,158.48	440,072.00	196,707.31	79,837.36
1889.....	1,976,350.38	1,146,876.12	829,474.26	2,838.00	832,312.26	36,956.25	519,352.00	329,670.57	53,666.56
1890.....	2,241,097.12	1,422,703.81	818,393.31	1,158.00	819,551.31	43,844.95	519,012.00	313,417.86	56,723.50
1891.....	2,160,118.24	1,332,292.34	827,825.90		827,825.90	44,825.90	516,932.00	253,692.62	12,375.38
1892.....	2,249,194.25	1,484,695.20	764,499.05		764,499.05	44,569.61	671,704.34	165,716.63	117,491.53
1893.....	2,078,777.54	1,474,754.88	604,022.66	10,135.51	614,158.17	42,846.18	870,166.66		298,854.67
1894.....	1,670,987.00	1,094,238.81	576,748.19	3,787.48	580,535.67	44,024.97	868,000.00	2,950.10	334,439.40
1895.....	1,811,823.03	1,121,503.33	690,319.70	55,076.00	745,395.70	35,601.65	866,385.00	26,735.86	183,326.81
1896.....	1,905,810.53	1,234,679.67	671,130.86	32,402.20	703,533.06	38,462.47	861,098.34	856.47	196,884.22
1897.....	1,591,114.88	1,064,723.70	526,391.18	20,607.56	546,998.74	41,031.71	860,168.33	7,953.78	362,155.08
1898.....	1,821,807.39	1,224,045.79	597,761.80	5,417.91	603,179.71	41,754.84	859,616.67		298,191.80
1899.....	2,407,437.39	1,468,896.17	938,541.22	4,937.31	943,478.53	53,653.43	859,700.00	16,067.66	14,057.44
1900.....	2,557,973.46	1,628,839.21	929,134.25	5,446.45	934,580.70	78,990.27	859,700.00		4,109.57

COPY BOUND C

June 30, 1902.	2,690,569.36	1,688,818.88	1,001,750.48	6,255.20	1,028,710.13	200,213.67	859,700.00	2,647.00	
1903.....	2,772,134.67	1,758,089.74	1,014,044.93	14,665.20	786,639.91	210,391.07	859,700.00		283,451.16
1904.....	2,524,612.07	1,749,456.12	775,155.95	11,483.96	869,881.28	216,733.73	859,700.00		206,552.45
1905.....	2,706,936.02	1,852,705.09	854,230.93	15,650.35	1,009,428.52	292,471.22	859,700.00	13,593.40	156,336.10
1906.....	3,057,775.40	2,057,459.76	1,000,315.64	9,112.88	999,950.65	170,282.84	859,700.00	25,503.76	55,535.95
1907.....	3,311,878.06	2,320,857.89	991,020.17	8,930.48				Dep. 35,539.30	
1908.....	2,986,958.38*	2,252,786.68†	734,171.70	30,405.22	764,576.92	186,345.24	859,700.00	39,653.56 " 28,204.21	356,661.18
1909.....	2,785,386.83*	2,037,900.83†	747,686.00	146,208.67	893,894.67	203,399.70	859,700.00	32,418.53 " 184,628.63	230,027.77
1910.....	3,372,089.65*	2,330,599.63†	1,041,490.02	50,658.14	1,092,148.16	225,917.63	859,700.00	173,616.86 " 19,340.81	351,714.96
1911.....	3,219,861.55*	2,330,955.87†	888,905.68	249,569.69	1,138,475.37	215,179.79	859,700.00	112,673.78 " 41,675.42	68,419.01
1912.....	3,224,906.58*	2,464,234.01†	760,672.57	39,238.61	799,911.18	217,417.86	859,700.00	93,325.98	412,235.08
Total, 1888-1912.	$61,228,605.63	$41,078,463.49	$20,150,142.14	$736,371.60	$20,886,513.74	$2,960,718.37	$19,724,215.41	$2,292,930.23	$4,091,350.27
1913.....	3,495,672.33*	2,802,658.57†	693,013.76	34,806.30	727,820.06	219,625.03	859,700.00	Dep. 46,072.54 198,620.53	596,198.04
Total.....	$64,724,277.96	$43,881,122.06	$20,843,155.90	$771,177.90	$21,614,333.80	$3,180,343.40	$20,583,915.41	$2,537,623.30	$4,687,548.31

*Includes revenue from Sleeping and Dining Cars.
†Includes expenses of Sleeping and Dining Cars.

Complainant's Railroad Well Located, Etc.

The railroad of the complainant is well located, was built pursuant to a public demand therefor, and is honestly, economically and efficiently operated and maintained.

At least ever since the commencement of this action, said railroad has been, and is now, well equipped, reasonably well maintained, and otherwise ample for the performance of the freight and passenger service required of it; and it has been and is being maintained and operated at a standard of excellence and efficiency as to road bed, structures, equipment and service on account of its passenger traffic, which the complainant claims is higher than would be reasonably required if its business consisted only or for the most part, of freight traffic.

The several railroads now constituting complainant's railroad system were constructed in response to a public need, and if they were now obliterated, the public need for their services would justify and require their reproduction.

Original Cost Largely Unknown.

Outside of the very small parts of said railroad constructed by it, the complainant does not know, and has no means of ascertaining the original cost of its system of railroads, or of any part of the main or branch lines thereof.

Earning Power of Complainant's Railroad as Affected by Water and Railroad Competition.

The railroad of the complainant is practically in direct competition with water transportation between Sault Ste. Marie and Duluth by Lake Superior and, for a large part of the way, with railroad transportation. During all the time since the commencement of this action, and for

many years prior thereto, the complainant has been and now is, in active competition with such water and rail transportation, and during all of said times, the freight and passenger rates of the complainant have largely been influenced by water and all rail interstate competitive and commercial conditions.

Earning Power of Complainant's Railroad as Affected by Passenger Rate Legislation in Michigan.

From the year 1867, when the first statute was passed regulating passenger rates in Michigan until the year 1889, the law authorized the complainant to charge 5¢ per mile for transportation of adults within the State of Michigan. In 1889 the law was amended so as to fix the maximum charge for this railroad at 4¢ a passenger mile. In 1907, the statute was again amended to reduce the rate to 3¢ a passenger mile, and in 1911 the Legislature passed the Act complained of in this case, being Act No. 276 of the Public Acts of 1911. This Act in brief provided that for all companies, the gross earnings of whose passenger trains as reported to the Commissioner of Railroads equaled or exceeded the sum of $1,200 per mile for each mile of road operated by any such railroad company on which regular passenger service is maintained, the maximum charge should be 2¢ per mile. For children under twelve years of age, a charge of half the above fare is provided.

Said Act No. 276 was approved and became effective August 1st, 1911. The passenger earnings of the complainant as reported to the Commissioner of Railroads for the State of Michigan for the year 1906 and for each subsequent year reported, down to the present time, exceeded the sum of $1,200 per mile for each mile of railroad operated by it within the State of Michigan on which regular passenger service was maintained.

In the consideration of this case, we are met at the outset by a claim of the defendants, which, if sustainable, would be decisive of the entire case, and would obviate any necessity for considering the question of the constitutionality of the statute. That claim is that the complainants are estopped from questioning the validity of the statute by reason of the acceptance of certain land-grants made to their predecessors. This claim will now be considered.

Rights and Duties of the State and the Complainant Company Resulting from the Gift to Complainant's Predecessors of State and Federal Lands to Aid in Construction.

The claim that the complainants are estopped from questioning the constitutionality of the statute is thus sated by the defendants:

> "We believe that we have clearly established that complainant has no standing in this court, for the reason that its predecessors in ownership of parts of its roadway made valid contracts with the State by which, in consideration of the conveyance of enormous quantities of land in the Upper Peninsula, they agreed that the State would have the right and power at all times and in all matters to control them and that they should be subject to all Michigan laws.
>
> "We have conclusively shown that the complainant is bound by, and subject to the obligations of those contracts and cannot now, in direct contravention of these contracts, question the validity of Act No. 276 of 1911."

The facts out of which this claim grows are as follows: By Act of June 3, 1856, 11 U. S. Stat. at Large 21,

Congress granted certain lands to aid in the construction of certain railroads in the State of Michigan. Among the railroads provided for was one from Little Bay de Noquet to Marquette, and thence to Ontonagon. By Section 3 of that Act, it was provided,

> "That the said lands hereby granted to the said State shall be subject to the disposal of the Legislature thereof, for the purpose aforesaid (the building of railroads) and no other; and the said railroads shall be and remain public highways for the use of the government of the United States, free from toll or other charge upon the transportation of any property or troops of the United States."

By various Acts of Congress, to-wit: Joint Resolution of July 5, 1862, 12 U. S. Stat. at Large, 620; Act of June 18, 1864, 13 U. S. Stat. at Large 137; Act of March 3, 1865, 13 U. S. Stat. at Large, 420, the time for the completion of the roads provided for in the Upper Peninsula of Michigan was extended.

By Act of February 14, 1857, Laws of 1857, page 346, the Legislature of Michigan accepted the grants made by the Act of June 3, 1856, and disposed of the lands to certain railroads. Among the railroads named upon whom the land grants were conferred by the State was the Bay de Noquet & Marquette Railroad to aid in the construction of a railroad from Little Bay de Noquet to Marquette, and the Marquette & Ontonagon Ry. Co. to aid in the construction of a railroad from Marquette to Ontonagon.

By Section 5, each railroad to which lands were granted was required to accept the lands, franchises, rights, powers and privileges conferred by the Act, and to assent and agree to the provisions and requirements of the Act.

Section 8 of the Act created a commission called a Board of Control, whose duty it was to manage and dispose of such lands to aid in the construction of the aforesaid railroad, and to do any and all other acts necessary and proper respecting the construction of said railroads which shall be prescribed by law.

Section 12 of the Act was as follows:

> "All of said railroad companies shall, at all times and in all matters, be subject to the laws of this state, and to such rules and regulations as may, from time to time, be enacted and provided by the Legislature of the State of Michigan, in regard to the management and disposition of the said lands not inconsistent with the provisions of this act, and the Act of Congress making said grant of land to this State, and they shall be entitled to all the immunities and privileges conferred by said laws; Provided, that nothing herein contained shall be so construed as to relinquish the right of the State to any specific tax imposed upon any railroad company within this State."

Both these last mentioned railroads accepted the benefit of the Act, and the Bay de Noquet & Marquette constructed a line from Marquette to Ishpeming, and became entitled to about 128,000 acres, which were subsequently patented to the Marquette, Houghton and Ontonagon Railroad Company. Later, it consolidated with the Marquette and Ontonagon Railroad Company under the latter name.

The Marquette and Ontonagon Ry. Co. failed to build any part of its line or to comply with the Act of the Legislature or to earn any lands, and in consequence the Legislature of Michigan, by Act approved March 17, 1873, forfeited its grant, and conferred the lands upon

the Marquette & Ontonagon Railroad Company. Thereafter the said railway company ceased to have any interest in or connection with the land.

By joint resolution of the Legislature, March 30, 1869, it was declared that the Marquette & Ontonagon Railroad Company had failed to complete its railroad as provided in the Joint Resolution of Congress of March 20th, extending the time for such completion and that, in consequence, the Legislature was authorized to declare the land grants to said company forfeited; but it gave a further extension of time, and provided that upon the failure of the company to construct certain portions of the railroad within a certain time specified, its grant should be forfeited, and that, in that event the Board of Control was authorized to confer said grants upon some other company.

Thereafter, on April 19, 1870, said Board of Control wholly forfeited the rights of the Marquette & Ontonagon Railroad Company in its land grants for non-performance.

It thus appears clearly that, while the Marquette & Ontonagon Railway Company and the Marquette & Ontonagon Railroad Company each accepted the provisions of said Act 126 of 1857, the State annulled and canceled said grants and the contract with said roads, on the ground that the companies never complied with the said Acts and never earned the grants or any part thereof.

On the same day on which this forfeiture was declared and by the same resolution, the Board conveyed said lands to the Houghton & Ontonagon Railroad Company upon certain conditions with which said last named company did not comply. Thereafter, by joint resolution of the Legislature of Michigan, of January 24, 1871, these lands were again granted to the Houghton & Ontonagon

R. R. Co. The joint resolution making the grant contains the following language:

> "Resolved, by the Senate and House of Representatives of the State of Michigan, that the action of the Board of Control, so far as it relates to the conferring of said forfeited lands on the said Houghton & Ontonagon Railroad Company on said 19th day of April, A. D. 1870, be and the same is hereby ratified and confrmed without the conditions imposed by said Board; and be it further resolved, that the lands forfeited by said Marquette & Ontonagon Railroad Company are conferred on the said Houghton & Ontonagon Railroad Company subject only to the conditions, restrictions and requirements contained in the said Acts of Congress relating to the granting of said lands to the State of Michigan."

The Houghton & Ontonagon Company accepted the grant only upon the terms of the said resolution of January 24, 1871, and it constructed and completed a sufficient line in compliance with law to earn 153,690.27 acres which the Marquette & Ontonagon Railway Co. had failed to earn, and also to earn an additional 44,578.12 acres, all of which lands were subsequently patented to the Marquette, Houghton & Ontonagon Railroad Company.

On or about September 2, 1872, the Marquette & Ontonagon Railroad Company and the Houghton & Ontonagon R. R. Co. were consolidated under the General Railroad Laws under the name of the Marquette, Houghton & Ontonagon R. R. Co., and so consolidating under the General Railroad Laws of Michigan were undoubtedly bound thereby; yet the Houghton & Ontonagon R. R. Co. already owned the land grants in question, except those secured from the Bay de Noquet R. R. Co., free from any restrictions, terms, or obligations imposed by said Act of 1857.

The Marquette, Houghton & Ontonagon R. R. Co. thereafter earned 180,389 acres on account of its own construction from Champion to L'Anse, but these lands were granted pursuant to the joint resolution of January 24, 1871.

By Act No. 197 of the Session Laws of 1875, the Legislature appropriated five sections per mile of its own swamp lands to aid in the construction of a line from the village of L'Anse to the Village of Houghton. The Act conferred power and authority upon the Board of Control of the State Swamp Lands to grant the lands to a railroad company and to prescribe the conditions of the grant, and a contract was entered into with the Houghton & L'Anse R. R. Co., a Michigan corporation, for the construction of this road, which was constructed, and thereby the railroad company earned 82,421.62 acres of State Swamp Lands. This act placed no obligation upon the constructing company other than to build the road. Only by inference was it required to operate it when constructed.

The Detroit, Mackinaw & Marquette Grant.

By Act No. 36 of the Session Laws of Michigan of 1873, an appropriation of the State Swamp Lands not to exceed 10 sections per mile, was made to aid in the construction of a railroad from the Straits of Mackinaw to Marquette. This road was to be completed before December 31, 1875. These lands were State Swamp Lands theretofore granted by the Federal Government to the State.

The granting act placed no obligation upon the constructing company except to construct the road and by inference to operate it. Unable to obtain the construction of the road under this Act, the Legislature passed subsequent Acts from time to time enlarging the grant and extending the time for construction, until finally the lands

were granted to, earned by, and patented to the Detroit, Mackinac & Marquette Company in March and April, 1883. This railroad was sold under foreclosure on October 20, 1886, and was purchased by Hugh McMillan and conveyed to him by deed recorded December 20, 1886. McMillan conveyed to the Mackinaw & Marquette R. R. Co., a Michigan corporation, which latter company, with certain other railroad companies, by consolidation in 1887, under the General Railroad Laws of the State, became the complainant.

The lands patented to the Detroit, Mackinac & Marquette Ry. Co. had been separately mortgaged. Neither the complainant nor its grantors ever had or acquired any interest in these lands.

The portion of the complainant's railroad from Nestoria to Iron River, Wisconsin, was constructed by a railroad syndicate and purchased by the complainant in 1888, and it never had the benefit of any land grant.

That portion of complainant's railroad originally known as the Marquette & Western Railroad, and extending from Marquette to Ishpeming, was constructed without the aid of any land grant.

That portion of the complainant's railroad extending from Soo Junction to Sault Ste. Marie was constructed without the aid of any land grant.

That portion of the complainant's railroad extending from Marquette to Houghton, and commonly known as the Marquette-Houghton & Ontonagon R. R. Co., including the additional line from Marquette to Ishpeming, known as the Marquette & Western Railroad, was purchased by complainant in 1890, and conveyed by deed of conveyance to the complainant.

None of the public lands conveyed by the said Federal Land Grants, and patented to the Marquette, Houghton & Ontonagon R. R. Co. ever passed to the complainant.

In acquiring all of said railroads the complainant only received the 82,385.29 acres of swamp lands originally earned in the construction of the Houghton & L'Anse Railroad. No part of the swamp lands granted in aid of the Detroit, Mackinac & Marquette Railroad ever came to the complainant, directly or indirectly.

The argument of the defendants in support of their contention is based upon the provisions of Sec. 12 of the Act of Michigan of 1857, above quoted. The line of reasoning is that before the Act was passed, all railroad companies were subject to the existing laws of the State and of the United States, and to such changes in these laws as do not infringe constitutional limitations; that in the declaration of Sec. 12, that "all of said railroad companies shall at all times and in all matters be subject to the laws of this State", the word "laws" must conclusively be presumed to have meant more than merely constitutional laws, because, otherwise, the provision would be useless; also that it cannot be "referred only to valid and constitutional laws, and thus to the laws allowing sufficient return from rates charged," but must go farther, because it must be construed most favorably to the public.

It is obvious that this contention goes to the extent of claiming that the land grant referred to and its acceptance constituted an agreement under which the Legislature had the power to fix uncompensatory rates, both freight and passenger, at its will and that the exercise of such power would be a benefit to the public.

I am unable to agree with this construction of the statute. The effect of such construction would be to hold that the Legislature, although it had granted these lands to aid in the construction of these railroads, might, by fixing uncompensatory rates, both freight and passenger, effectually take away the property which it had granted

and so defeat the very purpose which both the State and the United States had in causing these roads to be constructed. The Complainants ask me to find that such a construction would be inconsistent with the purpose expressed by Congress in the Act granting the lands, viz: "that these railroads should be and remain public highways for the use of the government of the United States" and also to find that if the Legislature had the intention claimed by the defendants in the adoption of Sec. 12, the section would be void as a contract made in favor of the State of Michigan in violation of its duties as trustee, and any acceptance of it by a railroad company void, as against public policy, and I so find.

Upon the question whether such contract was entered into, I find that it was not. I cannot believe that it was contemplated or intended by either of the parties in interest. To my mind, it is unbelievable that the parties accepting the land grant did so with the uderstanding that their property was to be placed so completely under the control of the Legislature as it would be under such an agreement. It is not believable that owners of capital available for railway investment would, as a business proposition, thus part with the control of their capital or property.

And it is equally unbelievable that the Legislature intended to so frame its railroad laws as to place such a ban upon railway investments in the State as would result from thus making the stocks and bonds of these Michigan railroads unsalable in the world's markets. It is to be presumed always that in the enactment of every law the Legislature intends to benefit the State, but such a law would not only not benefit the State but would be a distinct injury, and this fact should be considered in seeking the legislative intent, for although it is not competent for the judiciary to review the judgment of the Legisla-

ture upon questions of public policy, and refuse enforcement of a law on the ground that it would be an injury to the State and the public, it is competent and proper, in the interpretation of Statutes for the Courts to consider the results that would inevitably or probably follow from any proposed interpretation—such consideration being not for the purpose of nullifying the legislative intent by judicial vote of an undesirable statute, but for the purpose of discovering and effectuating the real intention and purpose of the statute. The fact that the interpretation claimed by defendant would be injurious to the State tends strongly to show that the Legislature did not so intend, and the question whether they did so intend is all that concerns us here. It is true that in the interpretation of a statute effect should as a rule be given to all the language of the statute, but the rule is not inflexible and does not demand interpretation beyond the necessities of the case under discussion. In this case, it is not necessarily incumbent upon us to find something upon which the language in question could effectually operate, or to find what the Legislature actually intended by the language used; our only concern is to determine whether the legislature intended by this language to impose the condition in question.

If we fail to find that the Legislature so intended, it is of no consequence to us in this case what their intention was in using the language in question. Did they so intend? The claim that they did so is based wholly on the language in question, but I am unable to find in that language anything which would justify the inference of such intention. On the contrary, so far from indicating such intention, the language employed seems to me to be incompatible with the existence of such intention. If the Legislature had such intention, it was their duty to express it clearly and unequivocally. Nowhere are clear-

ness and accuracy of expression more imperatively demanded than in Legislative enactments. The construction claimed by defendants would involve, it seems to me, an unbelievable dereliction of duty in this regard. According to that claim, the idea that the Legislature had in mind and there intended to express could, and would have been clearly, accurately and easily expressed, had they made in the statute the following provision: "In consideration of the lands hereby granted, the companies receiving the same agree to accept and abide by any freight tariff or passenger fare which the Legislature may provide, and thereby waive any and all rights which they would otherwise have under the Constitution to question the validity or legality of such rates on the ground that they are confiscatory of the company's property."

Now, if this was what the Legislature intended, why did they not say so? Why did they choose, rather, to cloak their intention in ambiguous, enigmatical, and misleading language? I can see no possible reason for such choice. If they had desired to impose the condition covertly and entrap unwary investors, the choice would have been a good one—a prospective investor would not have suspected that this innocent looking provision covered such a pitfall—but that the Legislature had any such motive is a supposition that cannot be entertained for a moment. On the contrary, we must assume that the Legislature sought diligently to avoid forms of expression that would be ambiguous and misleading, and this assumption, it seems to me, precludes any inference that the Legislature had the intention claimed by defendants.

To sum up:—in view of these three considerations, viz:

(1) that it would involve a breach of trust;

(2) that it would be detrimental to the interests of the State; and

(3) that it involves the assumption that the Legislature having a certain intention which could readily have been clearly and accurately expressed, and being under solemn obligation to so express it, deliberately chose not to so express it, but employed, instead, a form of expression which was obscure, uncertain and misleading—in view of these considerations, I say, I find it impossible to believe that the Legislature intended to impose the contion in question; and therefore that the complainants are not estopped from questioning the legality of the prescribed rate.

If, however, I am wrong in this conclusion—if the complainants are, as regards any part of its railroad, estopped by the acceptance of land grants from questioning the legality of the prescribed rate, I find upon the facts hereinbefore stated that such estoppel applies to only a part of their railroad; that Sec. 12 above discussed is applicable only to the twenty(20) miles of railroad constructed by the Bay de Norquet & Marquette Company, as the companies constructing the remainder of the roads receiving the grant therefor expressly took the grant "subject only to the conditions, restrictions and requirements contained in the Acts of Congress relating to the granting of said lands to the State of Michigan."

Having found that the complainants are not estopped from questioning the validity of the prescribed rate, we come to the main question: Is the statute confiscatory?

As the law is well settled that a statutory rate is not confiscatory if it will yield a fair return upon the value of the property employed in earning the rate, and conversely, it is confiscatory if it will not yield such return, the precise question to be determined here is, whether the rate in question will yield such return.

Upon this question, the complainants allege that the rate will not, and the defendants allege that it will yield

such return; and a very great amount of testimony has been taken in support of the respective contentions.

In considering the effect to be given to this testimony certain questions have arisen as to the burden of proof and its requirements in this case which require to be determined preliminarily to the consideration of the effect of the testimony on the main issue. On this subject, the defendants claim that the presumption in favor of the constitutionality is of a very strong character requiring a very high degree of proof to overcome it, and that it extends not only to the main questions at issue, but to every subordinate question that may arise and requires everywhere the same degree of proof as on the main question. As this claim is very strongly urged and relied on by the defendants, and as it affects the consideration of every question in the case, it is desirable to consider carefully in advance the burden of proof in this case and its requirements.

The Burden of Proof and Its Requirements in This Case.

That the burden of proof rests upon the complainants in this case, and requires them to prove affirmatively that the statute in question is unconstitutional, no question is raised, but as to the precise degree of proof required to discharge that burden, there is much question and controversy, the claims of the respective parties in that regard being very conflicting.

The complainants claim that the burden of proof resting on them is dischraged if "upon the whole proof the Court has a conviction reasonably free from doubt." And that "there is no single fact necessary for complainants to prove which may not be established by a fair preponderance of the evidence precisely as such fact may be established in any other civil action." The defendants claim, on the other hand, that the complainants'

proofs must go much further. They make, in this regard, two distinct claims; first, the extreme claim that the complainants must prove every material fact involved, "beyond the possibility of a doubt"; and second, the more moderate claim that complainants are required to prove every material fact beyond a reasonable doubt—substantially as the fact of guilt is required to be proven in criminal cases.

As the questions raised by these conflicting claims relate to rules which may affect the decision of every question of fact arising in the case, it is necessary to consider these questions of law before proceeding to consider the questions of fact to which they are to be applied.

Taking up those conflicting claims in the order of their mention, I find the complainants' is untenable. It is well settled that every legislative enactment is presumed to be constitutional until the contrary is proved, and this presumption in favor of the statute in question here the complainants must meet and overcome by proofs. Now, if there were no such presumption as this, the complainants would still be required to prove "every single fact" by a preponderance of evidence, so that, if their contention on this point were sustained, the presumption in favor of the validity of the statute would practically have no effect in the case. As it will not do to admit the existence of the presumption and at the same time deny that it has any effect, the complainants must do more than produce a mere preponderance of evidence in proof of essential facts, and the question, therefore, is how much more must they do?

The general answer to this question is well settled; and it is that they must prove their contention beyond a reasonable doubt. It has been so held in a long line of cases, including the well known one of Ogden vs. Saunders, 12 Wheat. 220, and has been uniformly recognized

by text writers; but as to what particular facts must be so proved there is much room for question.

As regards the defendants' claims the first, viz, that complainants must prove every material fact beyond the possibility of a doubt, I find untenable. It not only conflicts with the rule of reasonable doubt, above mentioned, but it would, if allowed, render it practically impossible to prove the unconstitutionality of any rate law, for in all such cases, the proof is, and in the nature of things must be, based largely upon estimates or opinion-evidence, and in such evidence there is always the possibility of a doubt.

The claim of the defendants appears to be based entirely upon the following language found in the decision in the Minnesota rate case:

> "Doubtless there may be cases where the facts would show confiscation so convincingly in any event after full allowance for possible errors in computation as to make negligible questions arising from the use of particular methods."

I can see nothing in this language that indicates any intention on the part of the Court of thereby laying down any rule of evidence, much less a rule so drastic and so inconsistent with the general rule above mentioned, and with the general purpose of all judicial evidence.

So far from evincing such intention, the Court, in that very case, did not require the complainants to prove their contention beyond the possibility of a doubt—but only beyond a reasonable doubt in accordance with the general rule above mentioned.

That that rule—the general rule of reasonable doubt—must govern in cases involving the constitutionality of a statute there seems to be no uncertaintly or room for question. But upon certain questions arising in the prac-

tical application of the rule, there is much question and considerable uncertainty.

The defendants claim that in order to satisfy the rule and prove beyond a reasonable doubt that the statute is invalid as against the complainants it is necessary to prove beyond a reasonable doubt every material fact averred in their complaint—that the presumption of constitutionality extends both to the main question as to whether the statute is confiscatory and also to every subordinate question involved in the determination of the main question; and that, in order to overcome the presumption as to any subordinate question, the same degree of proof is required as is required in regard to the main question.

As this claim is strenuously urged, and largely relied on to defeat the complainants' action, and as the defendants are entitled to whatever benefit the presumption of constitutionality affords, it is necessary to inquire into the precise nature and extent of the presumption in favor of the constitutionality of every legislative enactment, and the reason on which it is based. Wherever that reason exists, the presumption applies and must be overcome. What is that reason? Why is it that the judiciary, although it finds by a preponderance of evidence in a given case that a statute is unconsitutional, refused, nevertheless, to nullify the statute until the proof of its unconstitutionality goes farther and removes all reasonable doubt.

The answer to this question cannot be better stated that in the language of Mr. Justice Cooley, found on page 183 of his Constitutional Limitations, as follows:

> "The constitutionality of a law is to be presumed because the Legislature which was first required to pass upon the question acting as they must be deemed to have acted with integrity and with a great desire

> to keep within the restrictions laid by the Constitution upon their action, have adjudged that it is so. They are a co-ordinate department of the Government, with the judiciary, invested with very high and responsible duties as to some of which their acts are not subject to judicial scrutiny and they legislate under the solemnity of an official oath which it is not to be supposed they will disregard. It must, therefore, be supposed that their own doubts of the constitutionality of their action have been deliberately solved in its favor so that the courts may, with some confidence, repose upon their conclusion as one based upon their best judgment."

It thus appears that the reason of the rule is that since it is the duty of the Legislature before enacting a law to consider carefully the question of constitutionality and become satisfied beyond reasonable doubt that the proposed law is constitutional, it must be presumed that they performed that duty and adjudged the law to be constitutional, and that a due respect for that judgment requires the judiciary to refrain from passing a contrary judgment until they are, in like manner, satisfied beyond reasonable doubt that the law is unconstitutional.

That such is the reason of the rule has been uniformly laid down and has never been questioned. In the early case of Ogden vs. Sanders (12 Wheat. 270), the Court, per Washington, J., says:

> "It is but a decent respect due to the wisdom, the integrity, and the patriotism of the legislative body by which any law is passed to presume in favor of its validity until its violation of the constitution is proved beyond all reasonable doubt. This has always been the language of this court when that subject has called for its decision."

The principle thus uniformly laid down, it should be noted, is confined to legislative judgments on the question of constitutionality. As thus enunciated, it does not extend to legislative judgments upon other questions. In order, therefore, to make the principle applicable to other questions, it must appear or be presumed, not only that the Legislature passed judgment upon such other questions, but that each and every of the judgments thus passed upon such questions was a necessary part of the judgment upon the main question of constitutionality.

In this case, it does not affirmatively appear that the Legislature passed judgment upon any of the questions involved. The question, therefore, what particular legislative judgments are to be respected here, is wholly one of presumptions. What questions are we here required to presume that the Legislature adjudged? Certainly the main question that the law was constitutional; and the contention of the defendants is that this presumption as to the main question necessarily carries with it the further presumption that the Legislature, in judging the main question, adjudged also all of the questions subordinate thereto (which means all the material questions in the case) and that all such presumed further judgments are entitled to the same degree of respect as the judgment upon the main question, and can be overcome only by the same degree of proof as is required to overcome the latter. Are we required to make these two presumptions? In the first place, must we presume that the Legislature, in adjudging the main question of constitutionality adjudged all of the questions subordinate to that main question that have arisen in this case? We clearly are not unless we must presume that the Legislature in judging the question of constitutionality employed exactly the same method as we are employing in this case. Must we so presume? What method the Legislature did, in fact,

employ does not affirmatively appear. There is nothing outside the law itself that tends to show what method was employed, but there is a provision in the law which does so tend, namely the provision that limits the application of the two (2) cent rate to those roads whose gross passenger earnings equal or exceed twelve hundred dollars ($1,200) per mile, and prescribes a higher rate for those roads whose gross passenger earnings fall below that amount.

This provision, though not directed expressly to the subject of constitutionality, is very significant in that connection, and must be given due consideration. It must be presumed that the Legislature, in making this provision, was seeking to prescribe for each of the two classes of roads, thus provided for, a rate that would be fair to the public and also both fair and constitutional as applied to the various roads; and from this it must also be presumed that the Legislature adjudged that as to all roads whose gross passenger earnings equaled or exceeded twelve hundred dollars ($1,200) per mile, the two (2) cent rate was constitutional.

Now, in what way are we to presume the Legislature reached this conclusion? It must be in one or the other of two ways, viz., either first that the legislative judgment of constitutionality was predicated entirely on the amount of gross earnings or else, second, that the Legislature determined the question of constitutionality in the same way that it is being determined here, and having thus reached its conclusion on that question, found in some way a connection between that conclusion and gross earnings of twelve hundred dollars ($1,200) per mile of such character that it adopted such gross earnings as the test by which to determine the applicability of the rate to any particular road.

As to the first of these alternative presumptions—it is

clear that it cannot be made. Such a presumption would imply that the Legislature found that there was such a necessary relationship between gross earnings on the one hand and net earnings and value of property employed on the other hand that the rate of return upon the value of property employed could be determined from gross earnings alone without determining the net earnings or value of property employed. As such a presumption would be absurd, it is the alternative presumption if any that must be adopted. Can we make this alternative presumption, viz., that the Legislature employed the method which is being employed here? In order to make such presumption, we must assume that the Legislature performed a colossal task; we must assume that preliminarily to the enactment of this law, the Legislature determined the value of the property of every railroad in the State and also its gross and net earnings and the rate of return upon property value to which each was entitled; and that, having determined all these things it further determined with reference to every road what portion of its property was employed in its passenger service and its gross and net passenger earnings; and from the presumption that it determined all these things we should have to presume further that the Legislature adjudged all the questions that would be involved in making those determinations which would, of course, be all the questions involved in this case.

Now, does a due respect for the presumed legislative judgement of constitutionality require the judiciary to make a presumption that is so manifestly impossible? I think not. And if it does not, then we cannot presume that the Legislature employed this method of determining the question of constitutionality, and therefore cannot presume that it adjudged the questions arising in this case which are subordinate to the question of constitu-

tionality; and therefore need not require proof beyond a reasonable doubt upon those questions on the ground that they have been adjudged by the Legislature. The only legislative judgment, therefore, that is to be presumed here, and out of respect to which proof beyond reasonable doubt is required, is the judgment on the main question that the law was constitutional.

This, however, is not entirely decisive of the question under immediate consideration. It does not follow therefrom that none of the subordinate questions are required to be proven beyond reasonable doubt. The defendants do not admit that their contention involves the necessity of presuming a legislative judgment upon the subordinate questions, but claim that regardless of whether such judgment is or is not to be presumed, the presumption of constitutionality applicable to the main question in and of itself casts upon the complainants the burden of proving beyond reasonable doubt the conclusion sought to be drawn by them upon each and every of the subordinate questions involved. In support of this contention, they argue that since a chain is no stronger than its weakest link, in order to conclude beyond reasonable doubt that the law is unconstitutional, every link in the chain of reasoning by which that conclusion is reached must itself be established beyond reasonable doubt and therefore that the conclusion claimed by complainants upon every question involved must be so established.

This argument is plausible, but it involves unwarranted assumptions. It involves the assumption that the conclusion which is drawn on the question of constitutionality is necessarily the last link in a chain of reasoning in which the conclusion on every material question involved in this case is a necessary link. Such assumption is unwarranted because the final conclusion on the question of constitutionality is not necessarily reached

by means of such a supposed logical chain nor is it invariably necessary in reaching such final conclusion to draw any particular conclusion on any one of the subordinate questions involved.

The final conclusion on the question of constitutionality is not necessarily or usually the last link in such a supposed chain of reasoning, but is, instead, the summing up of, and the striking of a balance between, two conflicting classes of reasons, viz., those which tend to show the constitutionality of the law and those which tend to show its unconstitutionality—those reasons consisting of the applicable rules of law and the facts and conditions proven to the court or cognizable by the court without proof and also the conclusion drawn upon the various subordinate questions involved. Of those minor conclusions some may and some may not be of such vital importance in the decision of the applicable rules of law and the facts and conditions proven to the court or cognizable by the court without proof and also the conclusion drawn upon the various subordinate questions involved. Of those minor conclusions some may and some may not be of such vital importance in the decision of the main question that in order to reach the main conclusion beyond reasonable doubt it is necessary that the minor conclusion also be established beyond reasonable doubt, but seldom, if ever, would all or many of the minor conclusions require to be so established; and whether any of them would, in any particular case, require to be so proven, and if so, what ones are questions to be decided in every instance by the tribunal whose duty it is to weigh all the evidence and draw the final conclusion upon the question of constitutionality as the same is presented in that particular case. And that tribunal in drawing such conclusion is not, in my judgment, required by any rule of law or logic to refuse to consider and give weight to

any conclusion that is supported only by a preponderance of evidence, upon the ground that it has not been established beyond reasonable doubt. The fact that such conclusion is not established beyond reasonable doubt, but is supported only by a preponderance of evidence is something that must be considered and it may be of such vital importance to the main issue as to forbid a conclusion on that issue that would be otherwise drawn; but whether it is or is not of such importance is for the court to decide, unfettered by any hard and fast rule on the subject. That this is true as regards the multitude of subordinate questions involved in the case is quite evident and that it is in a measure true as regards even the three main questions appears from a moment's consideration of conditions that might occur. Thus, if the value of the property were proven only by a preponderance of evidence and the expected return were proven beyond a rasonable doubt to be such as would not pay a fair return on more than one-half the amount which it appears from a preponderance of evidence the property was fairly worth would it not be clearly competent for the court to consider the general effect of all the evidence and to conclude that the evidence on the whole showed beyond reasonable doubt that the rate in question would not yield a fair return on the value of the property? According to the defendant's contention, it would not. Their contention is that the rule here invoked by them is a hard and fast rule of law which forbids the court from adjudging this law unconstitutional unless and until the complainants' contention on every question involved in the case has been established beyond reasonable doubt. This contention is based, it seems to me, on a fundamental misconception of the nature of the rule of reasonable doubt on constitutional questions. In my judgment, there neither is nor can be any such rule of law on the subject.

A rule of law binding on the courts must have a legal sanction either in legislative enactment or in established usage. The rule in question neither has nor can have either of these sanctions. It cannot derive a sanction from established usage because it originates with the courts and is grounded not upon usage but upon a judicial sanction that has and can have no reference to usage, and it cannot derive a sanction from legislative enactment for the same reason, viz., that it is a creature of the courts existing without and independent of any authority derived from legislative enactment.

It derives its sanction from the power of the judiciary to nullify legislation on constitutional grounds—a power that is derived by the judiciary directly from the constitution and which therefore is and must be wholly independent of legislative control. If its exercise could be controlled by legislative enactments requiring the judiciary to exact certain proofs or certain degrees of proof before declaring any legislative act unconstitutional it could be practically nullified or destroyed by legislative action, whereas it is a power which by its very nature is and must be beyond the reach of legislative authority. This power thus derived from the constitution necessarily includes the power to make regulations as to the means and methods of its exercise, and it is in the exercise of the power to make such regulations that the rule of reasonable doubt has been prescribed. It is, then, a rule of procedure or adjective law as distinguished from a rule of substantive law, and as such is, like other rules of procedure, within the control of the courts, and not a rule the enforcement of which a litigant may demand as a matter of right. It is not a rule of private right but of public policy—a rule of inter-departmental comity. Its enforcement by the courts is a duty which

the judiciary owes not to any private party asserting rights under the law in question, but to a co-ordinate branch of the government of which the judiciary is a part —the branch that enacted the law. It is a reciprocal duty reciprocating with a duty which the Legislature owes to the judiciary. It is the duty of the Legislature on the one hand to enact laws that are constitutional and to refrain from enacting those that are unconstitutional, i. e. to refrain from calling on the judiciary to administer and enforce unconstitutional laws, and it is the duty of the judiciary on the other hand to enforce all laws that are constitutional and to refrain from enforcing those that are unconstitutional and the latter duty is no less imperative than the former. As all laws are mandates to the courts the Legislature when it enacts an unconstitutional law thereby not only itself violates the constitution but also calls upon the courts to do likewise. The enforcement of an unconstitutional law would be in itself a violation of the constitution by the judiciary at the behest of the Legislature. This the judiciary will not do; but before refusing to do so it will exercise special care in determining whether the law is or is not unconstitutional. What degree of care it will so exercise is wholly a question of the respect due from the judiciary to the judgment presumed to have been pronounced by the Legislature that the law was constitutional; that is to say it is a question of public policy relating to the proper maintenance of the balance of governmental functions designed to be secured by the tripartate partition of powers established by the constitution, and not at all a question of private right between the parties. As a measure of conservatism and a method of exercising special care in determining the question of constitutionality the judiciary has imposed upon itself the restraint of this rule of reasonable doubt. Now the adoption of this rule clearly confers on

litigants no rights that they would not otherwise have had. It affords a litigant no standing from which to demand an enforcement of the rule as matter of private right for him. Its enforcement may benefit him but if so such benefit is merely incidental to the public benefit which constitutes the purpose of the rule, he may argue as vehemently as he wishes for the enforcement of the rule, but his arguments can have weight only as they are based upon considerations of benefit to the public and not of benefit to him.

From the foregoing conclusions, it seems to me very clear that there neither is nor can be any rule of law by which the courts are bound to require proof beyond a reasonable doubt upon all or any of the subordinate questions arising in this case.

But it does not follow from this that such proof will not be required—does not follow that the rule of reasonable doubt will not be applied to any subordinate questions—it merely results that subordinate questions may or may not require to be proven beyond reasonable doubt and it leaves the question open whether any and if so what subordinate questions require to be so proven. And as this open question can be determined only in the final summing up on the main question it results in leaving the complaining party at his peril to prove beyond reasonable doubt all such subordinate questions as are liable to require to be so proven in order to establish his contention on the main question of constitutionality beyond reasonable doubt.

And when all the proofs both pro and con have been made it devolves upon the Master to deal with this open question as to the applications of this rule of reasonable doubt to subordinate questions. What is his duty with regard to that question and how is it to be performed? It is his duty to determine whether the fact of unconstitu-

tionality has been established beyond reasonable doubt, and in the performance of this duty he is required to make specific findings upon all the questions involved, and in doing so, he must apply the rule of reasonable doubt not only to the main question but also to all such subordinate questions as must be established beyond reasonable doubt in order to so establish the main question. But as he cannot know in advance of his final summing up what ones of the subordinate questions will require to be so proven, how is he, in making his specific findings on subordinate questions to determine whether his finding upon that question must be established beyond reasonable doubt or only requires to be established by preponderance of evidence and therefore whether the rule of reasonable doubt is to be applied to that question? The answer to this question, I conceive to be this, that inasmuch as some of the subordinate questions will probably require to be established beyond reasonable doubt, and all of them may possibly so require, and as his findings are subject to review, it is the duty of the Master in making his specific findings to supply the rule of reasonable doubt to all material questions and if in any instance his finding is based not on proof beyond reasonable doubt but on a preponderance of evidence merely it is his duty to so state. This will properly preserve the rights of both parties, as it will give to the defendants the full benefit of the presumption of constitutionality and to the complainants the full benefit of their proofs and at the same time it will apprise the court specifically of all the steps by which the Master's final conclusion has been reached. Such is the course that will be followed by me in determining the main question whether the unconstitutionality of the prescribed rate has been established beyond reasonable doubt, and it will therefore be understood that, except where it is otherwise expressly stated, all the con-

clusions arrived at herein have been found by me to have been established beyond reasonable doubt.

I have discussed the subject of this presumption thus at length because the defendants insist strenuously that it applies to every one of the multitude of questions arising in the case and in numerous instances, claim from it most important results, even such results as would, in some instances, be decisive of the case, and in others would prevent freedom of inquiry and judgment. Thus, for example, on the question of net earnings to be anticipated under the 2¢ rate, they claim that we must presume that the Legislature adjudged that the decrease in rate would produce an increase in volume of traffic so great that there would be no decrease in net earnings resulting from the decrease in rate and that that judgment must be presumed to be correct unless the complainants prove by affirmative evidence and beyond a reasonable doubt that such resulting increase in volume of traffic would not be great enough to have that effect. As such affirmative proof is impossible, and as the statute could, by no possibility be confiscatory if it caused no decrease in net earnings, the presumption of constitutionality thus applied would be decisive of the case.

Again, on the subject of valuation, the defendants claim that where estimates of value disagree, this presumption requires that we must always accept that lowest one because the fact that somebody so estimates the value creates a doubt of the correctness of every other estimate and as every doubt must be resolved in favor of the statute, the lowest estimate must be accepted as the true value—a doctrine which would preclude freedom of judgment.

To the foregoing findings with reference to the burden of proof defendants' objection No. 2 is addressed. The objection is that I have committed error

"upon the question of the degree of positiveness of proof required, of those contesting a statutory rate of fare, to establish the invalidity of such rate, and in not finding that it is essential that every material question and conclusion, upon which the invalidity of a statutory rate is predicated, be established beyond controversy and beyond the possibility of a reasonable doubt, as well as in numerous instances throughout the report failing to apply the rule that every question throughout the controversy of sufficient materiality and importance, taken separately or cumulatively, as to affect the result, must be resolved in favor of the validity of the rate-fixing statute."

It is further stated that the applicable principle has been enunciated in many cases.

"It is that every presumption is to be resolved in favor of the validity of legislative enactments; and rate-fixing statutes form no exception. The effect of this salutary rule has never been permitted to be frittered away by nice distinctions or refinements of reasoning, as is here attempted.

No discretion is vested in the courts in determining whether the Legislature, as a co-ordinate branch of the Government, has exceeded its authority. When positive proof of the exercise of excess authority is produced, then, and then only, can the courts perform their duty of declaring statutes to be unconstitutional. Before that duty arises, or will be performed, it must appear beyond possibility of reasonable doubt that the statute is unconstitutional, and, in order that it may so appear, it must also appear that *every link in the chain of evidence* to show such invalidity is established beyond doubt. Such invalidity is not permitted to rest upon equivoca-

tion or opinion, and where there is doubt on any question or element, that doubt must be resolved to sustain the legislative action. We feel that in a number of instances throughout the case the doubt has not been resolved by the Master in favor of the validity of the statute, but has been resolved in favor of the complainant. A few of the particulars which may be pointed out are the following:

> In allowances for the items "Contingencies," "Taxes," "Appreciation," "Working Capital" and "Stores and Supplies."
>
> In refusing to depreciate ballast and track laying and surfacing.
>
> In acceptance of complainant's alterations of defendants' modified revenue train-mile ratio for division of common property and common expenses.
>
> In the determination that decreased rates will not, and did not subsequent to 1907, produce increased traffic."

The presumption referred to in this objection has been quite fully discussed by me in connection with the findings to which the objection relates, but it has been so strongly urged at all points by defendants, and so implicitly relied upon in many instances as an insuperable defense to the complainant's case, that some further discussion of it here may be desirable. At a great many points in the case, the presumption has been brought forward in a way which, if sustained, would end the case at once.

In considering this objection, the first thing to be noted is that it misapprehends my findings both as regards the principle of law applicable to this subject, and also as

regards my application of that principle in determining questions of fact.

With regard to my findings as to the principle of law involved, the fact is that I have fully adopted the doctrine contended for by the defendants, except that I do not adopt their extreme claim that all material facts must be proved beyond the possibility of a doubt.

As regards the principle of law here involved, therefore, the only question to which this objection can apply is whether the defendants are right in this extreme contention. Upon this question I see no reason for changing the views already expressed. I can find no authority in precedent or foundation in reason for this extreme doctrine. I am unable to find in the numerous cases cited by defendants in this connection any support for such dictrine or any intention to give any other or greater effect to the presumption in question than is given to it by me in my findings. And I am equally unable to find any foundation in reason for such doctrine. To my mind it would be irrational for any court of justice, and especially for a court of equity, to adopt and apply a rule that it would refuse relief unless the facts calling for relief were proven beyond the possibility of a doubt, and still more especially where those facts were in their very nature non-susceptible of such proof. In fact, the application of such a principle or rule to human affairs is inconceivable. Outside the domain of mathematics, there is no such thing as proof beyond the possibility of a doubt. A rule to suspend action until all possibility of doubt regarding it and its effects had been removed, would arrest and paralyze every form of human activity.

Disallowing, therefore, this objection, insofar as it reasserts this extreme doctrine, I pass to the consideration of that part of the objection which relates to my applica-

tion of the principle of reasonable doubt as adopted by me.

The assertion involved in this part of the objection, that in reaching my conclusions I have, in numerous instances, resolved doubts in favor of complainant and against the defendants, is a mistake. In reaching my conclusion, I invariably resolved my doubts in favor of the defendants, and reached no conclusion until I was satisfied, beyond a reasonable doubt, that the conclusion was correct. The mistake thus involved in this objection arises, as it seems to me, from two distinct misconceptions of the nature of that which is designated by the word "doubt" in the phrase "reasonable doubt", either of which misconceptions would render the presumption in favor of the validity of legislative action an indisputable presumption in fact, although the defendants recognize it in theory as a disputable presumption.

The first of these misconceptions is in conceiving a reasonable doubt to be something which exists extraneously to, and independently of, any individual mind, and which, like a problem in mathematics, has one and only one correct solution for all minds, whereas the fact is that that which is there designated by the word "doubt" is an individual state of mind—a state of mind in which the individual having the doubt is hesitating to accept a certain conclusion because he is not entirely certain of the existence of all the facts or the soundness of all the inferences required in order to justify the conclusion contemplated. It is to this state of mind that the rule in question applies when the proposed conclusion is in favor of complainant, and it there requires that the proposed conclusion be not accepted until all such uncertainty is removed, even though the preponderance of evidence is in favor of the conclusion. Resolving all doubts in favor of the defendants means refusing to accept such con-

clusion so long as there remains any reasonable doubt of its correctness—that is to say, any doubt having a good foundation in reason.

Now, whether such doubt exists, and if so, against what evidence to the contrary it will continue to exist, is of necessity a question to be decided by the particular individual mind which is asked to draw the conclusion.

In deciding the question, it is of necessity his doubts, and not the doubts of somebody else, that he is to resolve in favor of the defendants, and it is of necessity he alone that can say how his doubts have been resolved. If he accepts the conclusion that fact gives no ground for saying that he has violated the rule and resolved his doubts in favor of the complainant. Nevertheless, the defendants here assert that in numerous instances I resolved my doubts in favor of the complainant with no other apparent foundation for the assertion than the fact that I accepted a certain conclusion. In doing so, they make the mistake of failing to recognize the individual character of doubt and of assuming that wherever a person reaches a conclusion different from that contended for by them, he has thereby necessarily resolved his doubts in favor of the complainant. And in doing so, they necessarily take the position that no conclusion different from that contended for by them can be reached in this case without violating the rule requiring all reasonable doubt to be resolved in their favor.

This is why I have said that their misconception of the nature of doubt, as that word is here used, is one of two misconceptions, either of which would render the presumption in favor of the validity of legislative action an indisputable presumption.

The other misconception as to the nature of reasonable doubt, as those words are used in a rate case, is that they conceive of doubt as being practically synonymous with

uncertainty; that wherever there is uncertainty of any kind or degree, there is also reasonable doubt, and that therefore, so long as there is any uncertainty, there can be no conclusion in favor of the complainant. Now, as the principal questions in a rate case always involve certain kinds and degrees of uncertainty, which cannot be eliminated, this conception of the nature of a reasonable doubt, it will be seen at once would, like the other, render the presumption indisputable.

That the defendants' position is that the presumption is in fact indisputable is further shown in their treatment of the principle adopted by me for weighing the presumption against opposing evidence. In this regard, I expected, and assumed, that they would recognize the necessity of adopting some principle for this purpose, and either accept the principle applied by me, or else point out its defects and state what they conceive to be the true principle. But they do neither, nor do they refer in any way to the principle applied by me, except by necessary inference to characterize it as involving equivocation, and as an attempt to fritter away the salutary effects of the presumption by nice distinctions or refinements of reasoning. No other conclusion can be drawn from their comments in this connection than that the defendants consider that there is, and can be, no such thing as weighing the effect of the presumption against opposing evidence and that any attempt to do so is anathema and a failure of due respect for the sanctity of the presumption.

That the defendants' position on this subject is that the presumption is in fact indisputable is again shown in the part of the objection not yet discussed which relates to the practical application of the presumption to the questions arising in the case.

This part of the objection is that the defendants "feel

that in a number of instances throughout the case, the doubt has not been resolved by the Master in favor of the validity of the Statute, but has been resolved in favor of the complainant." It then mentions nine subjects which it says are a few of such instances. It does not, however, offer or indicate any reason for saying that upon those subjects the doubt has not been resolved in favor of defendants, but obviously bases its assertion wholly on the fact that the conclusion was in favor of complainant, from which it is evident that the defendants' position is that such conclusion could not be reached at all without resolving the doubt in favor of complainant and violating the rule in question. In this they assume that the conclusion is required to be one of entire certainty as to the uncertain element, which it is not. The conclusion is not and cannot be required to be one of such accuracy as will eliminate all uncertainty. The precise nature of the conclusion will be best exhibited by examining it as arrived at in concrete instances. Such instances are found in connection with each of the nine subjects specified, and I will now proceed to consider these subjects in the order of their mention under the objection.

Presumption as Applied to Contingencies.

This subject is evidently regarded in the objection as having the greatest degree of uncertainty as contingencies are by their very nature uncertain. A contingency is an event the happening of which is uncertain—it may or may not happen—and if the conclusion required to be drawn here was to the effect that any particular contingent event would be certain to happen or not to happen, the conclusion could not, in the nature of things, be reached without violating the rule in question. But such is not the conclusion. In order to apprehend the

precise nature of the conclusion, it is necessary to bear in mind what it is exactly that we are here seeking to do. We are seeking to determine the value of the complainant's property. And to this end we are seeking to ascertain what it would cost to reproduce or duplicate it. This cost can by no possibility be determined with accuracy. The most that can be done in that regard is to make a fair estimate of what the cost may be expected to be, based upon knowledge and experience. Such estimates the two engineers have made. And in making them, they estimated separately, item by item, all the foreseeable costs, and stated that in addition to these foreseeable costs there were many that could not be foreseen and estimated item by item, and these costs they grouped under one head as contingent costs or contingencies.

Now, the testimony shows indisputably that according to all experience in such matters, such contingent costs are certain to be incurred in some amount, but in what amount precisely is very uncertain. It appears from a clear preponderance of evidence, that the amount to be fairly anticipated for contingent costs in a reproduction of complainant's property would be from 10 to 15 percent of the other property schedules except lands, and that this is the amount that would be added for contingencies by any competent engineer in furnishing estimates of probable cost for the guidance of investors, and it is the amount which should be added here, were it not for the presumption in question. But it is very uncertain what would be the actual amount of contingent costs and doubtful whether they would be as much as 10% or 15% of the schedules mentioned. In consequence of this doubt, the allowance which I have made is not the amount that would ordinarily be expected for contingent costs, but the minimum amount that can reasonably be expected

—the amount below which the contingent costs cannot, in reason, be expected to fall.

The conclusion thus reached by me is not that $400,000 is the amount that would actually be required to pay the contingent costs, or that it is an amount that would, according to the testimony, be sufficient to cover all of the contingent costs, but that it is a fair and reasonable estimate of the minimum amount below which the contingent costs cannot be expected to fall, and which must, therefore, be regarded as certain to be incurred beyond all reasonable doubt.

The conclusion, therefore, reached upon this subject is one that does not involve resolving the doubt in favor of complainant, but is reached after resolving all reasonable doubts in favor of defendants.

It will be noted that the defendants' specific objection to this item of contingencies is not as to the amount of the item, or that under the evidence it is too large, but that no allowance of any amount can be made on account of contingencies—which, of course, would render the presumption indisputable as far as this item is concerned.

Presumption as Applied to the Other Subjects Mentioned.

What is said here of contingencies in this connection is applicable also to the second, third, fourth and fifth subjects mentioned, viz: Taxes, Appreciation, Working Capital, and Stores and Supplies. In valuing each of these items, I resolved all my doubts in favor of the defendants.

The next two subjects, viz: Ballast, and Track Laying and Surfacing, call for specific comment. The defendants' contention here is that I resolved the doubt in favor

of complainant in refusing to depreciate either of these items.

Here we encounter the curious contention that the enactment of this statute by the Michigan Legislature raises a presumption that ballast depreciates.

Of course the question whether ballast does or does not, in fact, depreciate, can no more be affected by an act of the Michigan Legislature than it can by the Apostles' Creed. Such a proposition would be on its face highly absurd, and it can be saved from such absurdity only by the theory and assumption that in enacting the statute, the Legislature adjudged this question and found that ballast does depreciate precisely as claimed by the defendants' witness, Mr. Hansel, or by some other theory that would thus connect the question of ballast depreciation with the action of the legislature.

But this theory the defendants do not accept. On the contrary, they visit upon it severe condemnation as an attempt by equivocation to fritter away the salutary effect of this presumption, and at the same time they offer no substitute. Unless and until the defendants bring forward some principle by virtue of which the enactment of this statute is made to have a bearing on the question of ballast depreciation. I am at a loss to see how they can claim that the enactment of this statute by the legislature has any bearing whatever on the question whether ballast does or does not depreciate, and therefore how it can be said that in refusing to depreciate ballast, I failed to give due effect to the presumption. And this would be so even if I had in fact refused to depreciate ballast.

But the fact is that I did not refuse to hold that ballast depreciates, but on the contrary held that it does depreciate precisely as claimed by defendants and as testified to by Mr. Hansel. What I refused to do was, first,

to include in the inventory any ballast that had been thus depreciated, i. e., by being blown away and by sinking into the embankment; and second, to place a depreciated value on ballast that had not suffered that kind of so-called depreciation; and third, I refused to find and allow an amount for depreciation from disintegration when there was not and could not, in the nature of things, be any evidence on which to base such a finding.

What I have said here regarding ballast is applicable also to the seventh and eighth subjects mentioned, viz: (7) my refusal to depreciate track laying and surfacing, and (8) my adoption of complainant's modified train mileage ratio for the division of common property and common expenses.

The ninth specifications is that I resolved the doubt in favor of complainant in two ways: first, by finding that reduced rates will not produce increased traffic, and second, by finding that reduced rates did not, subsequent to 1907, produce increased traffic. With reference to the first, it is not a fact that I so found; on the contrary, I found that reduced rates will, in all probability, produce increased traffic. And as regards the second, the fact in that regard is a matter of record on the existence of which the presumption in question can have no bearing whatever.

In these instances, also, it seems to me that the defendants in reality recognize no possibility of overcoming the presumption by proof although they do so in theory.

This peculiar position of the defendants is regrettable. If the presumption is indisputable in fact, it ends this case as effectually as though it were so in theory also. But I can see no possibility of question that it is my duty to treat it as disputable, and therefore to the best of my ability to weigh it against the opposing evidence offered. In the performance of this difficult and delicate

task, I need and desire all the assistance possible from counsel on each side. But I am offered no principle for guidance, and as regards the principle which I have adopted, I am merely told that it is an attempt to fritter away the salutary effect of the presumption.

That it was not such an attempt, but an earnest effort to find a means of rationally weighing the presumption against opposing evidence, it is unnecessary to say, but it is important to point out that the adoption of such principle, or one that will accomplish the same result, instead of being an attempt to fritter away the salutary effect of the presumption, is the *means* and the only means by which the presumption can be given any rational effect whatever. That this is so appears clearly from what has been said above on the subject of the presumption as applied to the question of ballast depreciation.

How would it be possible within reason to say that the enactment of this statute created a presumption upon any one of the many questions of fact to which defendants apply it, except upon the principle that we must presume that the legislature actually adjudged the question and adjudged it correctly?

For example, how would it be possible to say that the enactment of this statute created a presumption that the defendants' modified train mile ratio is correct, or that their claimed value of the Marquette Station property is correct, except upon the theory that the legislature passed upon those questions and came to the conclusion contended for by defendants? In the absence of such theory, how does the enactment of this statute have any more bearing on those questions than would the enactment of a law changing the rate of interest or the regulations as to the granting of marriage licenses?

I have discussed this presumption thus fully because it

bulks so large in the defense to this case, and because we must follow one or the other of two courses—we must either find and adopt some method of measuring or weighing the strength of this presumption against opposing evidence, or else frankly recognize the presumption as absolute and indisputable, instead of saying that it is disputable, and then denying that there is any possibility of measuring it, or any propriety in trying to do so.

Before taking leave of this subject, it is desirable to call attention to another presumption regarding legislative action which, although referred to by defendants, has not been given due recognition and effect in this case. The defendants at one point contend, and rightly, that we are bound to presume that the legislature, in enacting this law, acted conscientiously and intended to observe all constitutional requirements, as was their duty; that they intended to enact a constitutional law, and did not intend to enact an unconstitutional law; and as it is well settled that in order to be constitutional, a rate law must be such as will yield a fair return upon the property employed, the legislature did not intend to enact a law that would not yield such return. Now if, on such careful investigation as has been made in this case, it is found that the prescribed rate will not yield such return, are we to presume that it is, nevertheless, the will of the legislature that this law be enforced against this railroad, or are we to presume the contrary? Are we not to presume that the will of the legislature in enacting this law was that it be enforced against all railroads in the state unless and until it is found on judicial investigation that it will not fulfill constitutional requirements in the case or any particular road, and that when so found, it be not enforced? The point here sought to be made is, not that there is any necessity for finding that such is the legislative will, but that an injunction

against such enforcement is not necessarily or presumably a nullification or overriding of the legislative will, but is presumably in accordance with that will.

Having thus determined the evidential requirements which must be met by the complainant, we proceed to consider whether those requirements have been met. Have the complainants proved beyond a reasonable doubt that the prescribed rate will not yield the required return on the value of the property employed? This question resolves itself into three subordinate questions, viz:

1. What is the value of the property employed?

2. What return may reasonably be expected under the prescribed rate? and

3. Will that return constitute a fair return upon the value of the property employed?

These three subordinate questions will be considered in the above order.

The Value of the Property Employed.

In proceeding to make the valuation here required we encounter at the outset a peculiar difficulty. We find that the required valuation must be made on a basis that involves an exact reversal of the order of economic reasoning usually employed in making valuations. In the order of economic reasoning usually and almost universally employed in making valuations the value of a thing is determined upon the basis of the profitableness of its most profitable use; but in the valuation to be made here the value sought is not a value that is determined on the basis of the profitableness of the most profitable use

to which the property can be put, but is, on the contrary, a value that is itself to constitute the basis on which the profitableness of that most profitable use is to be determined. The value sought must be of a kind that will properly constitute such a basis.

What is that kind of value? What kind of value is there that is capable of performing this unusual and one might say, abnormal function of determining the profitableness of the most profitable use? This question must be clearly and satisfactorily determined at the outset, as otherwise all subsequent discussion will be liable to constantly recurring confusion of thought resulting from uncertainty as to the meaning of the word value as here used. The necessity for determining this question clearly in advance, and the difficulty of doing so are strikingly shown in the numerous differing views that have been put forth as to what precisely is meant by "value" in rate cases, some of which go so far as to say that there is, in reality no such thing as value in rate cases; and that the rights of the respective parties must be determined by other considerations. Thus Professor H. C. Adams, testifying in this case says, "In my judgment this thing that we call 'value' in practical questions is a thing to be gotten at in order to arrive at equitable conclusions between contending parties, and it is always necessary to know what the contention is and what the relative rights of the parties are in order to proceed in any analysis or definition of values."

And Professor E. W. Bemis in a Gas Case at St. Paul in May, 1914, said in effect that in rate cases there is in reality no such thing as value, but that "fair value" or "amount of property" or "fairness" is meant.

The complainant's counsel did not undertake to specify the particular kind of value, or principle of valuation that should be uniformly applied to all the railway prop-

erty in this case, but left the question open. But the defendants' counsel did so specify and stated on pages 189 to 192 of his printed brief as follows:

"The value of the property determines the amount of return to which the company is entitled. One of the principal problems of the case is to find that value. That value is not the original cost, the investment, the value of the stocks and bonds, the book or cost value, the cost of reproduction new, or that cost of reproduction affected by depreciation. There is no definite rule for determining precisely what that value is but it is safe to say that it is such a sum as in the judgment of the Court, considering the property, its history, and all surrounding conditions and elements, the company is entitled to a return upon, and the public is required to support."

"The high point of property value which can be used as the basis for figuring the return in a case contesting rates, is the commercial value—the value which is predicated upon the ability of the road to earn under normal and competitive conditions with rates unregulated. A cost of reproduction or present physical value of the property may bring the basis for fixing rates below the sale or commercial value of the property, but a high cost of reproduction cannot be permitted to carry or fix the amount on which the utility shall be entitled to a return, above the commercial or sale value."

"The reason is obvious. The utility is entitled to a return upon the value of the property, not upon its cost, and value is not fixed by cost, by present physical condition or by the amount or value of stocks or bonds, but is fixed by the intrinsic commercial or sale value."

These differing views of the subject are typical of what is very generally found in the discussions of value in rate cases in consequence of which one often seems to be traveling in a circle and arriving nowhere in particular; and they emphasize the necessity for a clear determination of the kind of value that is to be sought and arrived at as preliminary to the work of valuation.

I am unable to see how any proper valuation for rate making purposes can be made without selecting and applying a kind of value or principle of valuation that will furnish a proper basis of rates, and that will be applicable to all the property. The complainant recognizes this necessity and accepts therefor the principle of valuation hereinafter set forth.

The position taken by defendants' counsel tacitly recognizes the need of such a principle of valuation and undertakes to supply it, but the principle which he offers, I am unable to understand clearly. He says:

> "The value of the property determines the amount of the return to which the company is entitled"; and "that value is such a sum as the company is entitled to a return upon."

The difficulty about understanding this is that it seems to me the same as saying that the value determines the amount on which the company is entitled to a return, and the amount on which the company is entitled to a return determines the value, which is so plainly reasoning in a circle that I feel that counsel must mean something that I do not catch. And this same peculiarity, I think, is found in all attempts to use the conception denoted by the phrase "commercial value" as a basis of rates.

With these remarks upon the difficulties of the problem, we now return to our question, what kind of value is it that furnishes the proper basis for rate-making.

Value may be defined as the desirability or worth of a thing as measured by the desirability of something else. The commercial value of a thing is its desirability measured by the desirability of money; and since money, as the medium of exchange, is the measure of the desirability of all things, the commercial value of a thing is its desirability as measured by the value of all things.

The word "value" is thus a term expressive of relationship. It expresses the relationship existing between the thing valued as regards desirability and some person or class of persons. Hence, everything of value has as many different values as there are persons to whom it bears differing degrees of desirability.

Again, the commercial value of a thing is always based upon the profitableness of some use to which the thing can be applied. Hence, everything has as many different values as there are different degrees of profitableness in the uses to which it can be applied.

From these premises, it follows that the kind of value which we are seeking as a basis of rates, must be a value based on some particular use, and it must be a value to some person or class of persons.

On the basis of what use and to what person or persons is the estimate of the value of a railway property to be made? In the Minnesota rate decision, certain values were rejected because they were based on railway use and were therefore dependent on rates; but it is obvious that that must not be taken to mean that all values based on railroad use are to be excluded; on the contrary; it is perfectly clear that for rate-making purposes, all values of railway property must be railway values, i. e., values based on railway use. A valuation of railway property for some other than railway use would be absurd on its face as a basis for railway rates. We must, therefore, proceed on the assumption that the value which is to

serve as a basis of rates is a value for railway use—adding, however, that although a value for railway use, it must not be a value that depends upon rates. What value is there for railway use that does not depend upon rates?

I have said that every value must be a value to some person. Now, every object of value to a person has for that person three distinct values, viz., a use value, a sale value, and a replacement cost value. These three values, I say, are entirely distinct; and they may vary widely. A thing may be of much more value to its owner to use than to sell, and vice versa; and the replacement cost, i. e., the amount that it would cost to replace or duplicate the thing may be greater or it may be less than either of the others. Now, both the use value and the sale value of a railway property depend upon rates, and for this reason neither can be made the basis of rates. But the replacement cost value does not depend upon rates. The amount which it would cost a railway company to replace any portion of its property would be the same whether the rates which it was permitted to charge were high or low.

Hence, if the foregoing reasoning is correct, replacement cost value is the value that fulfills the two requirements above mentioned, viz., that it be for railway use, and that it be independent of rates. And as it is the only value that fulfills those requirements, and as those requirements are absolute, it is the only kind of value that is available for the purpose of a rate case.

In this case, it is recognized as such and adopted by the complainant's counsel, but the defendants' counsel claims that the kind of value to be employed here is not replacement cost value, but commercial value.

Now, the commercial value of a property is the amount for which it can be sold, either in bulk or in parcels, and

the value that is contemplated here by defendants' counsel is that which would be realizable from a sale in bulk—i. e., a sale of the entire property as an organized and operating railroad property. But the amount for which the property could be thus sold would clearly depend upon the rates permitted to be charged for the service in which the property is employed. How, then, is it possible to use commercial value as a basis of rates? This difficulty is recognized by counsel and is sought to be met in the language above quoted by defining commercial value as "the value which is predicated upon the ability of the road to earn under normal and competitive conditions with rates unregulated."

The position here taken by counsel, I am unable to understand clearly as it seems to me to lead to results directly opposite to what he desires. By "rates unregulated" is evidently meant rates unregulated by statute; and it is true, of course, that the commercial value of a road with rates unrestricted by statute would not be dependent upon statutory rates as there would be no such rates; but the rates there chargeable would be restricted by the competitive conditions mentioned, and by common law requirements as to reasonableness; and the commercial value of the road would be dependent upon the rates as thus restricted; and it would be determined by the road's "ability to earn" under those competitive conditions.

Now, if the commercial value so determined is the kind of value to be employed in a rate case, what will be its effect upon rate-fixing statutes? Is it not clear that when thus judged every rate fixing statute will necessarily be found either unconstitutional or useless? If it lowers the rate that is maintained under competitive conditions, it is unconstitutional; if it does not do so, it is useless. If the competitive conditions under which the

complainant's road is operating are such that the road can maintain no higher rates than those fixed by the statute in question, the statute is useless; but if the competitive conditions are such that the road could maintain higher than statutory rates, then the commercial value of the road would be determined by the higher rates and the statute if put into effect, would not yield a fair return on that value and would, therefore, be unconstitutional.

As this result is the direct opposite of what counsel desires and as I cannot see how he reaches any other result, I infer that I have been unable to understand his contention correctly.

Furthermore, if this theory of commercial value in a rate case is correct, this case is being tried on a wrong theory, and the great amount of testimony taken on the subject of value has been taken to no purpose. That testimony does not show or even tend to show with any directness the commercial value of the property contemplated by this theory. The value which it is designed to show is that which is represented by reproduction cost new less depreciation plus appreciation. This value may, or it may not be the same in amount as the commercial value claimed by defendants, but if it is the same, such identity is purely accidental as there is no relationship existing between the two kinds of value that would cause such identity—the two kinds of value being determined by different sets of conditions. This being so, this claim of commercial value, if sustained, would either put an end to this case or require that it be tried over again on different testimony.

In fact, we may omit the above alternative and say that it would put an end to the case finally and absolutely for the reason that there could be no testimony produced for the trial of the case and the determination of value on

that theory of value. The value of the property based on its earning power under normal competitive conditions with rates unrestricted by statutory regulation could be estimated only where there had been experience under such conditions which would furnish results available for such a basis of estimate, and there has been no such experience. The company has never operated with liberty to charge rates unregulated by statute and limited only by the danger of discouraging business or driving it to competitors. It knows nothing of what could be done under such conditions and can form no estimate whatever. The only knowledge that it has of the earning power of the road is that derived from its experience in operating under rates restricted by statute—a knowledge which, though available for estimating what may be expected from future operations under rates restricted by statute, furnishes no basis for estimating results realizable from operations under rates free from statutory restriction.

I am, therefore, unable to see how the defendants' theory of commercial value can have any possible application in this case.

In addition to the foregoing, I am also unable to see how the theory in question can be harmonized with the decided cases. The Minnesota rate case and rate cases generally have proceeded on the theory herein adopted, and have settled quite clearly that the kind of value to be determined in a rate case involving the question of confiscation is that which is represented by reproduction cost new less depreciation plus appreciation.

Now, this kind of value, although it is commercial value in a certain and proper sense (as hereinafter pointed out) is not commercial value in the sense of the defendants' theory nor has it any direct connection therewith.

When, therefore, the courts say that reproduction cost new less depreciation plus appreciation may be taken as value for the purposes of a rate case, they do not mean that that is necessarily the economic value of the property in question, but that it is a sufficiently accurate estimate of value for the purpose in hand, viz; to determine what it would cost the company to supply that particular property for public use; in other words, it is replacement cost value judicially determined.

Now in what relation does this replacement-cost value stand to commercial value? Curiously enough the answer to this question is that although in a certain sense different, these two values, in a certain other sense, are identical—that the value thus judicially determined as replacement cost value is also commercial value—not in the sense of commercial value which is the amount for which the property could be sold by the company in bulk as an organized and operative entity as claimed by defendants (that value being dependent on rates and therefore inadmissible) but in the sense of the amount for which the property could be sold in parcels, not by the company wanting to sell, and breaking up the property into parcels to be sold to various purchasers and scattered in other uses, but sold by owners of the various parcels to the company wanting to buy for the purpose of assembling and organizing the parcels into an operating instrumentality for transportation. In other words, the replacement cost value of each parcel thus determined is the commercial value of the parcel to both vendor and purchaser, i. e., it is the amount for which it could presumably be sold by the owner to the company and vice versa, the amount for which it could presumably be purchased by the company from the owner. And the total of all the values of the parcels thus determined is the total commercial value of the entire property, not as an

operating instrumentality for transportation (the value of which would depend upon rates) but as an aggregation of properties possessing potentialities for organization and railway use—a value which is not dependent upon rates and the only value that is not so dependent.

This then, is the kind of value to be employed in a rate case, and it is here called replacement cost value, because that name indicates the basis on which the value is estimated, and distinguishes it from reproduction cost value and from commercial value. In the present case it is, as already pointed out, the only kind of value that can be determined for it is the only kind shown by the evidence, there being no evidence of any value other than that which shows the amount of reproduction cost and the condition of the property as regards depreciation and appreciation.

The conclusion thus reached, the defendants' counsel does not accept. His contention is that while the replacement cost is a relevant subject of inquiry, it is only one of a number of subjects of such inquiry; that replacement cost is only one of many of the evidences of value all of which must be considered, and that therefore, when we have estimated that cost we have not determined value but must go further and consider many other evidences of value and base our valuation on all of them instead of on replacement cost alone. The position thus taken involves an idea of valuation in rate cases which has been more or less entertained in connection with the various discussions on the subject, and has, it seems to me, tended to render the work of making such valuations one of baffling, if not hopeless, uncertainty. It is an idea which should either be fully and clearly recognized and established, or else as clearly repudiated for, in its present status it is only a serious embarrassment. It is of so much importance both in this case and in all rate cases,

as to justify further discussion of it here. As stated in defendants' brief, page 189, in the language already quoted above, it is as follows:

> "That value is not the original cost, the investment, the value of the stocks and bonds, the book or cost value, the cost of reproduction new, or that cost of reproduction affected by depreciation.
>
> There is no definite rule for determining precisely what that value is, but it is safe to say that it is such a sum as, in the judgment of the court, considering the property, its history, and all surrounding conditions and elements, the company is entitled to a return upon and the public is required to support."

This I believe to be as good a statement of this idea of value as can be found anywhere, and, to my mind, it throws the whole subject of judicial valuation in rate cases into a serbonian bog of confusion and uncertainty. Examine it, and see to what it leads. It first shows what this value is not; thus "it is not the original cost of the investment, the value of the stocks and bonds, the book or cost value, the cost of reproduction new"—(all of which is perfectly true)—"or the cost of reproduction affected by depreciation" which is the exact point in question, and which, if true, would promptly put an end to this case. It would do so because the value which is shown by reproduction cost new less depreciation is, as we have already seen, the only value proven in the case, there being no evidence on which to base a finding of any other value.

Having thus told us what the value is not, the statement then proceeds to tell us what it is, as follows: "It is such a sum as, in the judgment of the Court, considering the property, its history and all surrounding conditions

and elements, the company is entitled to a return upon and the public is required to support."

This involves an inversion of cause and effect. It is, of course, true that the value of the property "is the sum that the company is entitled to a return upon", but the fact that it is so does not help us to determine value, but on the contrary, is precisely the reason why we are trying to find out what the value is—the reason for wanting to know the value being that we want to know the amount that the company is entitled to a return upon, and the only way to find this out is to find the value of the property. But, according to the statement of counsel, we are doing exactly the reverse; instead of finding the amount that the company is entitled to a return upon by finding the value, we find this amount that the company is entitled to a return upon by "considering the property, its history, and all surrounding conditions and elements" and then assuming that amount to be the value. This seems to me a clear case of putting the cart before the horse.

When the courts say that the company is entitled to a fair return upon the value of the property, I understand that we are required to ascertain the amount of that return by finding the value of the property and determining the amount required to furnish a fair return in that value; but according to the defendants' theory we are required to do exactly the reverse, viz; first ascertain the amount of return that the company is entitled to by finding its earning power under certain conditions, and then estimating its value on the basis of its earning power.

For the foregoing reasons, it seems to me that the idea of commercial value in rate cases is merely a prolific source of confusion, and should be wholly excluded from consideration.

The foregoing discussion of value applies to all values except bare land values estimated independently of improvements. And as to those values it applies so far as regards the principle of replacement cost. There, as elsewhere, it is the amount that it would cost the company to acquire the property that determines the value on which the company is entitled to a return.

How is that amount to be determined? How can we ascertain or estimate the amount that it would cost to purchase a certain parcel of land? In the case of property other than land, we are able to estimate cost by ascertaining unit prices of material and labor and from them computing the cost of reproducing the thing under valuation. But in the case of land, this of course cannot be done as a parcel of land is not the product of labor, but is *sui generis*, and cannot be duplicated. In order to be acquired, it must be purchased from the owner, and if his ownership were absolute the cost of acquisition would depend entirely upon his will, and therefore could not be estimated. But land ownership is not absolute but is subject to the power of eminent domain by means of which the owner may be compelled to sell for a price determined judicially, and this power thus performs for land values the function which the power to reproduce performs for other property values. As the willingness of the owner to sell is an incalculable element, the estimated cost of acquisition or replacement cost value of land must be the amount that it would cost to acquire the land by condemnation proceedings.

How is that amount to be determined? How shall a Court of Equity in adjudicating a rate case determine or estimate the amount that it would cost to acquire by condemnation a certain parcel of land? Shall it form its own estimate of the value of the land from proper evidence and assume that the amount so found would be the cost

of acquisition by condemnation? Or shall it undertake to estimate the amount which a jury would award in such condemnation and assume that to be the cost of acquisition?

The only authoritative answer that we have to this question is that contained in the Minnesota rate decision. In that case the trial court was asked to and did take the latter course. Testimony was introduced showing that it was customary for the jury in condemnation cases to award the owner more than the value of the land for other purposes, and that the amount of this excess value was from two to three times that of the normal value of the land; also that the company would be compelled to pay severance damages, and also certain costs for legal expenses, engineering, superintendence contingencies, interest during construction, etc., which should be included in the estimated cost of acqusition.

This seems on its face a quite natural and logical application of the general principle of determining value by cost of reproduction or replacement; there is no doubt that the actual cost of acquisition by condemnation may be and frequently (perhaps generally) is enhanced over normal land values by some or all of these considerations, but on examination it is seen that such an application of the principle of reproduction cost is entirely inadmissible. It would require the Court not only to find as a fact an improper custom on the part of juries in condemnation cases of making excessive awards but also to measure the extent of this excess generosity and accept the amount of it as the value of the property as determined by cost of acquisition. In the decision of the case by the Supreme Court this is held to be an unreasonable application of the cost of reproduction method of ascertaining present value, and is declared to involve impossible assumptions. The Court there says:

> "It is impossible to assume in making a judicial finding of what it would cost to acquire the property that the company would be compelled to pay more than its fair market value. It is equipped with the governmental power of eminent domain. In view of its public purpose, it has been granted this privilege in order to prevent advantage being taken of its necessities. It would be free to stand on its legal rights and it cannot be supposed that they would be disregarded."

From this it seems clear that in estimating the cost of acquisition the Court is not to speculate upon what a jury would find in condemnation of the land, but is to form its own estimate of value from the evidence produced and to assume that the land could be acquired for that amount under the law of eminent domain. This may seem to involve a logical inconsistency in that it determines cost of acquisition by value instead of determining (as we were supposed to be doing) value by cost of acquisition, but the inconsistency is apparent rather than real; the value that here determines the cost of acquisition is that which the law prescribes shall be awarded in condemnation cases and the reason for taking it as cost of acquisition is that it is so by law prescribed; while the value that is to be taken for testing the validity of rates, although the same in amount, is taken because it represents the cost of acquisition. The distinction may seem shadowy but it is real and its substance consists in this, that the value that is to be used as a basis of rates must have a basis and its basis must be one that does not depend upon rates and the only basis that fulfills this requirement is, as already pointed out, that which is furnished by the conditions which determine the replacement cost. And this basis is equally available whether those conditions consist in legal requirements as in the case of

land values, or in present unit prices of material and labor as in the case of other property values.

The final conclusion at which I arrive therefore on the subject of value is that both as to lands and as to other property, the inquiry must be directed to the ascertainment of replacement cost, which in the case of property other than bare land is reproduction cost less depreciation plus appreciation, and that when that cost has been ascertained by proper estimate we have the valuation required for testing the validity of statutory rates.

To my views on the method of determining value defendants' objection No. 3 is directed. The objection is to my alleged finding and conclusion "that the cost of reproduction value less depreciation, or the 'replacement cost value', is to be taken as the absolute measure of the value which must be sustained by the rates permitted to be charged." The argument is as follows:

> "Not only the leading case of *Smyth vs. Ames* (169 U. S. 546-47), but practically every rate case, to the present, recognizes that no single element or rule of valuation is to be applied in determining the value of the property which must be supported by rates, and that all the company is entitled to ask is a fair return on that which it employs for the public convenience. Value is not determined by replacement cost, though that may be a consideration in determining what is fair to the public and the utility, in the light of the rule that the interests of both must be considered."

Whether this statement is correct or not depends upon what the defendants mean by the word "recognizes." If they mean that all the cases, or any cases, have discussed

the question of the need or admissibility of a single rule or principle of valuation, and have held that no such rule or principle can be applied or recognized, the statement is, I believe entirely incorrect. I have carefully examined all the federal cases which I have found on this subject, and have found no case of which the statement is correct.

If they mean by the word "recognizes" that all of the cases have been adjudicated without specifically discussing the need or desirability or practicability of formulating and applying such a rule or principle, the statement is, with the exception perhaps of the Minnesota rate case, substantially true, and for the reason that the question was not distinctly raised in any of them. The fact that the kind of value precisely that is required to be found in a rate case is of special character and somewhat different from that which is ordinarily meant by the word value in common parlance, does not seem to have been brought out in the cases until the decision in the Minnesota rate case rendered while this case was pending. In that case questions arose which called for a more careful consideration of the subject of value in a rate case than had hitherto been called for, and the court in its decision discussed the question more fully than had been done in previous cases, and therein laid down such principles for the valuation of railroad property in a rate case as were required for the decision of that case.

That decision being the latest and most authoritative utterance on the subject, I studied it carefully in an effort to determine what kind of value precisely it was that the court intended should be found and applied in a rate case, but was unable to settle that question clearly in my own mind, because the word "value" was used in different places in connection with different qualifying words in such a way that the precise kind of value intended was not clear to me.

I thereupon asked from counsel on each side answers to a series of questions on this subject, and received answers from each, but although helpful in some ways, neither of the answers attempted to define or specify the precise kind of value required, and they were in disagreement on some essential questions.

After a further and very careful study of the subject, I reached the conclusion set forth in my findings, viz: that the kind of value that is required to be found in a rate case is what I have there called "replacement cost value," meaning by that reproduction cost, less depreciation plus appreciation. This I became convinced is the kind of value that meets the requirements of the Minnesota rate case and of every rate case, and that it is the only kind of value that will meet those requirements. That conclusion I believe to be in entire harmony with every adjudicated case instead of being in conflict with all of them, as here claimed by defendants.

In referring to the case of Smyth vs. Ames, counsel evidently have in mind the part of that decision which mentions "the original cost of construction; the amount and value of outstanding bonds and stock, and the probable earning capacity of the property under rates prescribed by statute" as some of the subjects which may be considered in valuing the property in a rate case; and in asserting that my conclusion conflicts with that case they evidently assume that the court there intended to say that the subjects mentioned must enter into and affect or influence the valuation, and therefore that no principle of valuation is admissible that does not take them into account. I can see no good ground for assuming that such was the intention in the language quoted; on the contrary, it seems to me that the language could not, in the nature of things, have been so intended. And if, in fact, the language quoted is capable of only the con-

struction given it by defendants, it has been disregarded by the later cases, none of which recognizes the proposition that the original cost of construction, the amount and value of outstanding bonds and stocks, or the probable earning capacity of the property under rates prescribed by statute, have any bearing in determining the value on which a public service corporation is entitled to a fair return.

Defendants' objection No. 4 relates to the same subject as objection No. 3 last considered. The objection is, in effect, that it is commercial value rather than replacement cost value on which the complainant is entitled to a return, and which therefore is to be determined as the basis on which the validity of the prescribed rate is to be tested. I have already found that the commercial value of the property in its entirety as an operating instrumentality cannot be taken as a basis of rates or as a basis on which to test the constitutionality of the prescribed rate, because it itself depends upon rates; and for this finding, and the further finding that it is replacement cost value that must be taken as such basis, I have already given my reasons very fully. On a careful consideration of this objection and the arguments advanced in support of it, I see no reason for changing the views already expressed, and no occasion for further discussion of the subject by me, except to explain why the argument in support of the objection fails to convince me or to show how commercial value can possibly be made to serve as a basis on which to test the constitutionality of the rate.

The argument is in substance this: that a railroad may not be worth commerically the amount of is replacement cost, and that where such is the case, replacement cost cannot be made the basis of rates, because it would be inequitable to require the public to pay a return on any greater amount than the commercial value, and that

therefore the rates should be reduced accordingly. Now, it is perfectly true, of course, that a railroad may not be worth commercially the amount that it would cost to replace it; but to say that where such is the case, that fact furnishes a reason for a reduction in rates, is a proposition that is to me wholly incomprehensible. It seems to me to involve a kind of mental inversion—the drawing of a conclusion that is the direct opposite of that which is plainly called for by the premises. Wherever a road is not worth commercially the amount of its reproduction cost, that failure of value is, of course, due to its inability to earn enough to pay a fair return on that amount, and that inability is intself due to one or the other of two causes, viz: either to a lack of business, or to restrictions imposed either by statute or by competitive conditions on the ability of the company to charge remunerative rates. And if it is true that the failure of earnings calls for a reduction in rates, the reason for such reduction must be found in one or the other of these two causes or conditions. Now, how is it possible to find in either of these causes a reason for compelling a reduction in rates? Suppose the failure of earnings is due to statutory rate restrictions; would it not be wholly irrational to say that such failure of earnings calls for a still greater restriction, as would be the case according to the defendants' theory?

Proceeding on the defendants' theory of the kind of value that is supposed to be protected by the constitution, how could any statutory rate be questioned, and what would there be to prevent an entire confiscation of the company's property?

If a falling off in commercial value is held to justify a reduction in rates, the constitutional protection against confiscation is thereby rendered a mere myth. Each falling off in commercial value will call for a reduction in

rates, and each reduction in rates will cause a further falling off in commercial value which further falling off in value will, in its turn, call for a still further reduction in rates, which will cause another falling off in value, and so on indefinitely until the entire value of the property disappears automatically under the working of this theory.

Precisely the same results would follow if the failure of earnings was due to either of the other causes. If it was due to competitive conditions, those conditions would, under this theory, call for a reduction of rates which would cause a further falling off in value that would call for a further reduction in rates, and so on until the end above indicated was reached.

Thus the competitive conditions would start this process of adjusting rates on the basis of commercial value, and that is all that would be necessary, for, once started, it continues to operate, automatically, until it has finished its perfect work in the complete wiping out of the value of the property.

If the failure of earnings was due to lack of business, the result would be the same as when due to competitive conditions, for competitive conditions means merely a lack of business sufficient for both competitors.

In illustration of their contention for commercial value, defendants cite a supposable case where the commercial value of a road has been greatly reduced by the building of a parallel line competing at all points, and where the quantity of business in the territory is only sufficient to pay a return on the reproduction cost of one of the roads. There they say the public should not be required to pay a return on the reproduction cost of both roads, but only on the commercial value of each as that value is affected by those competitive conditions, and that the rate should

therefore be reduced below what it was before the building of the competing line.

This contention involves a confusion of issues. It involves the assumption that the issue here is the same as it would be where one or both the supposed roads is asking for an increase of rates because of the increased amount of property created by the addition of another road. If such were the issue, the contention that such increase should not be granted would be perfectly sound.

But the issue in a rate case involving the question of confiscation, instead of being the same or similar, is exactly the reverse. There the claim is not for an increase in rates, but for protection against a decrease, and the question is whether there is good ground for a decrease.

In the supposed case, the claim of the railroad company would be that the building of the competing line and the cutting in two of the earnings furnishes no reason for a decrease in rates,—that the duplication of the property devoted to the service does not lower the cost of the service in the least, or increase the earnings realizable from the business, but only has the effect to spread these earnings over a greater amount of property,—thus causing a loss, not to the public, but to the owners of the property —and that it is contrary to all reason to say that this loss to the owners entitles the public to a reduction in rates involving a still further loss to the railroads.

For the foregoing reasons, I am unable to see from defendants' objection and argument thereunder how commercial value can possibly be made to serve as a basis for testing the validity of rates.

But it is such a reduction and on such grounds that the defendants call for in this case. They liken the complainant's road to a road which has been paralleled by a competing road; they claim that it has since its construction been subjected to competition at all important points,

which has greatly cut down its earning power, and that for this reason it is not worth commercially what it would cost to reproduce it, although it was worth that amount when constructed; and that the rate should therefore be reduced.

Now, suppose that the rate is reduced on this ground. Can there be any question that the commercial value of the road would be thereby further reduced, and when such reduction in value has taken place, is there not then just as good reason for a further reduction in rates as there was for the reduction just made? And is there any reason why the process of rate reduction thus started should not continue, automatically making one reduction after another so long as there was any value remaining for it to operate upon? Is it not clear from these considerations that commercial value cannot possibly be made to serve as a basis of rates? Nay, is it not clear that the prescribing of rates by the Legislature on that basis would be a complete inversion and abuse of the legislative power to regulate rates? In order to see that it would be it is only necessary to recall the nature and purpose of that power, which is this: In granting a railroad charter, the rate for the time being is fixed in accordance with present conditions; but the charter will run for a long period, or indefinitely, and it may be that in the course of time those conditions will change, that the business of the road may so increase that the company can well afford to carry at a lower rate than that prescribed in the charter, and as the business may be more or less of a monopoly, the Legislature reserves the right to change the rate to correspond with the changed conditions and prevent the company from unduly profiting at the expense of the public, but always with the understanding that this power cannot be exercised in such a way as to deprive the company of its property rights,

which are the rights to render the service and to charge such a rate therefor as will pay what the service is fairly worth, which is such a rate as will pay all expenses and a fair return on the value of the property employed.

Now come the defendants with their doctrine of commercial value, and claim that the complainant's rates should be reduced by this reserved legislative power, not because their business has *increased* to such an extent that they can afford to carry at a less rate, but because their business has decreased, and decreased to such an extent that even under the former rate, it will not yield a fair return on the value, and therefore the property is not worth what it would cost to produce it. To make a reduction in rates on such ground would, it seems to me, be to turn the whole scheme of legislative rate regulation topsy turvy. If rates can be regulated by the Legislature on this principle, railroad property in Michigan has no value, except such as the Legislature may choose to give it, and therefore nothing to be protected by the constitution against confiscation.

Valuation of Complainant's Property.

To meet the issues in this case, complainant caused an inventory and appraisal of all its property to be made as of date June 30th, 1911, by Henry E. Riggs, a civil engineer, with special railroad experience. The defendants later caused an inventory and appraisal to be made on their behalf by Charles Hansel, a civil engineer with special railroad experience as of date October 1st, 1912. Still later in the case, the complainant company caused another inventory and appraisal to be made by Mr. Riggs as of date June 30, 1913. These inventories were arranged in schedules, which schedules were numbered from 1 to 43, inclusive, and both engineers followed substantially the same method. In making my valuation, I

follow the same schedules, using the title for each schedule used by the engineers and including in the valuation of each schedule the property which they included therein.

In connection with each schedule the various objections made thereto are considered and discussed, both as regards property and principles of valuation, except where such objections would be more appropriately considered in connection with another branch of the case.

Schedule 1.—Right of Way and Station Grounds.

Before proceeding to the general valuation of complainant's lands, it is desirable to consider certain parcels of the same with reference to their special character and value. These are as follows:

Lands With Special Value on Account of Their Adaptation for Railroad Purposes.

In this schedule are embraced two tracts of land for which complainant claims a special value on account of its adaptation for railroad purposes, viz, the so-called South Yard in the City of Marquette, in the County of Marquette, and the right of way in Houghton County from Pilgrim River to and including the Houghton terminal.

The defendants do not deny the complainant's "right to include any value due to special adaptation which inheres in the land itself", but claim that such "value is not ascertainable by reference to conditions which measure it in the hands of the taker instead of in the hands of the individual owner;" and their objection is based upon the claims that the special value here claimed by complainant is one that is determined by reference to such conditions, i. e., that it is the special value of the property to the complainant as a component part of its rail-

road property as an organized entity. If the special value claimed were such in fact, it would be subject to this objection, but it is not as such that it is claimed by the complainant. It is claimed by them as a value which inheres in the land itself, which would exist in the hands of any owner, and be realized by any railroad having occasion to make use of the land.

I find that the special value as claimed by complainant exists in each of the two tracts of land in question; that it exists in the Marquette property to the amount of $29,590 in excess of the value of the same land for other than railroad purposes of which total $22,890 appertains to the freight service, and $6,700.00 to the common service; that it exists in the land of Houghton County to the extent of $8,534 in excess of the land for other uses, of which amount $2,449 appertains to the freight service and $6,085 to the common service. That these two tracts of land have a special value for railroad purposes is undisputed in the case. Defendants' own witness, Mr. Hansel (Record 5103) testified that the Marquette yard was the natural place for a yard and the land by nature adapted for a yard. He also testified that the right of way practically all the way from Chassel to Houghton possessed like special value.

Mr. R. C. Young, an engineer, estimated the cost of constructing a yard at Marquette in the place next best adapted for the same. He found that this yard could not be so cheaply operated or constructed as the south yard, and making allowance for this extra cost of construction and operation, he placed the value of the South Yard at $108,800 more than the value of the cheapest substitute yard which could be found, provided the value of the land in each yard for other than railroad purposes was the same. He testified that he knew that such value was not

equal but that the land in the South Yard was more valuable, but he could give no definite figure.

As this substitute yard was located on land owned by the complainant and valued in this case, I am able to supply from other testimony the necessary valuations. I have found the value of the land in the South Yard for general purposes to be $101,710 and the substitute yard $22,500, or a difference in favor of the substitute yard, by reason of its less valuable land of $79,210, thus making the south yard more valuable by reason of its natural adaptation to railway purposes by $29,590. Mr. Young's testimony on this subject will be found Record pp. 7000 to 7014.

The special value of complainant's land from Pilgrim River to and including the Houghton Terminal was estimated by an engineer, F. M. Batchelder, by a comparison of this route with the next most available and cheapest route. The calculation was along the same lines as Mr. Young's valuation, except that it was not necessary to take into consideration difference in cost of operation. (Record 6485-6608.)

Lands with Water Rights Appurtenant.

At the City of St. Ignace in the County of Mackinaw, the complainant owns lands on the harbor which fronts on the Straits of Mackinac. In the City of Marquette, in the County of Marquette it owns lands on the harbor which front on Lake Superior; and in the City of Houghton in the County of Houghton it owns lands which front on Portage Lake.

With reference to the company's lands at St. Ignace which abut upon the water, it was the claim of the defendants that the lands and the water right appurtenant thereto should be valued separately, and the value of the water rights be excluded from the inventory of the com-

plainant's lands, because the water rights were not necessarily for railroad use.

The facts are that at this place the complainant maintains a slip for the landing of ferry boats, by which ferry boats alone complainant's railroad is able to make connection with the Michigan Central and Grand Rapids & Indiana Railroads in the Lower Peninsula of Michigan. It also maintains a lumber dock for the shipment of lumber by water, and a merchandise dock for the reception from and delivery to boats of freight and passengers.

The complainant's claim that there is no occasion for valuing water rights separately, but that the entire value of the property including water rights should be included in the inventory for two reasons. First, that the water rights are actually in railroad use by reason of the fact that it is necessary to control those rights in order to secure the needed free access to and use of the company's structures now in the water there, as such access and use might otherwise be cut off or impaired by the exercise of such water rights were they in the hands of others; and second, that wherever property is in actual railroad use the company is entitled to a return upon its full value even though some part of that value grows out of rights which are not being actively and fully exercised by the company.

Each of these claims raises a distinct and somewhat difficult question, the former a question of fact and the latter a question of law.

As to the first question, viz: Is it a fact that the control of the water rights of all those shore lands at St. Ignace, is required by the company in order to protect the railway use of their structures in the water against outside interference?

In answer to this question I find that it is not possible to determine from the evidence exactly what quan-

tity of such shore lands it is necessary for the company to thus control. That it is necessary for the company to control for that purpose the water rights of some of the shore lands, other than what is required for access to their structures in the water, is unquestionable; but just how far such necessity extends does not appear from the evidence and is difficult to determine with accuracy on account of the shape of the bay on which these riparian lands lie. But such determination is not necessary for the purpose of this case—the only question here being, not what lands are so required but whether the lands listed by complainant are so required. On this question the evidence shows that all the riparian lands at St. Ignace listed by complainant are so required, and I find as a fact that all the shore lands at St. Ignace listed by complainant are in railroad use and fairly necessary for such use—necessary either for the maintenance and use of their existing structures or to prevent the erection of other structures which might interfere with such use.

As to the second question, viz, whether the company is entitled to include in their valuation of these lands the value of the water rights even though they do not exercise those rights otherwise than required for protection of the free use of their structures, now in the water, while the question may not be entirely free from doubt, I find that if the company are entitled to list the shore lands in the inventory as being in railroad use, they are entitled also to their full value of the water rights. I have accordingly so valued those lands, making no separate valuations of these water rights. In fact no separate valuation could be made by me of these shore lands at St. Ignace or of those at Houghton, as there is no testimony on which to base it.

At Marquette the tract of riparian land owned by the

railroad is considerable in extent and is put to varied uses.

At the commencement of this suit, the railway company owned and operated two ore docks, one of which ceased to be used during the progress of the suit. It owned a dock for the unloading of coal from boats and also a merchandise dock. It had on the property various buildings used by it for office and storage purposes. A very small part of the land was leased to Armour & Company as a site for a warehouse.

Two small tracts abutting on the water were leased for fish-houses, being the headquarters of fishing tugs doing lake fishing. It was obviously essential that the railroad should hold the title to those fish-house sites to conserve the use of its ore docks in the harbor.

The two coal docks and the merchandise dock were leased to firms or corporations which operated them. One of these firms had a small elevator on the property and carried on a merchandise business in coal, lime, cement and other building materials, and in feed and grain.

The leases to these parties excepted the tracks of the railway company which extended to all parts of the property, i. e., reached all the industries except the fish-houses, and the lessees in all instances paid the railway company a fair rental considering the value of the property occupied. In valuing this property, I find no practical way to deal with it except to treat it and value it as a whole, and to include it as a whole in the inventory of the complainant's real estate, and to include in the railroad earnings all the rents and profits derived by the railroad company from its tenants. I find that all of this land, including the appurtenant water rights is necessary and in use for railway purposes, the facts with refer-

ence to the water rights being essentially similar to the situation at St. Ignace.

Since the decision by the Supreme Court of the United States in Norfolk & Western Ry. Co. vs. Conolly, and Northern Pacific Ry. Co. vs. North Dakota, the question of how this property shall be treated becomes of minor importance, as all of it is devoted exclusively to freight use.

In the City of Houghton the complainant owns 1,500 feet abutting upon Portage Lake. The main use of this property is as a terminal. It is claimed by the defendants that the land should be valued exclusive of its water rights, and the water rights not included in the inventory of property as being in use for railroad purposes. Portage Lake connects the Cities of Houghton and Hancock with Lake Superior and with Lake Linden. At Houghton the complainant's railroad connects with the Mineral Range Railroad, which serves the Copper Country, so-called, consisting of a large part of Houghton County and all of Keweenaw County. The passage across Lake Linden is on a bridge. It is in evidence that, several years ago, this bridge was destroyed by a boat, and until a new bridge could be built, the only method of railroad connection between the large population of Houghton, and the important copper and other industries north of Houghton, was by scows which carried cars across and landed them upon the water front. It is in evidence that frequently this water front has been used for the reception and delivery of freight. It is the only point on Portage Lake where the complainant's railroad can make connections with the water, either for the reception or delivery of freight. Although these water rights were not in actual use while this case was being tried, the land to which the water rights were appurtenant was in use for railroad purposes, and the use of the water right

is liable to be required at any time, and I therefore think that the land, including the water rights may fairly be considered as in railroad use, or at least, necessary for railroad use, and so I find.

Trackage Rights in Streets.

In the complainant's inventory and appraisal of property is certain land lying on Lake Street (a public highway) in the City of Marquette, over which the complainant has, and exercises, under an agreement with the city, a right of way for the maintenance and operation of its railway. This agreement is a mere license which is liable to be terminated at any time by the grantor, but the complainant claims, nevertheless, that it is entitled to include the property so used, in its inventory and at a fair valuation, the same in all respects as if it belonged to it in absolute ownership. Against this the defendants claim that the complainant is entitled to value only its rights in this property; that its right in this property is a mere permit which may be revoked at any time, and which therefore has no determinable value, and should have no value assigned to it in this case.

The question thus raised depends upon the question as to what property it is, exactly, that the company is entitled to a return upon. If it is entitled to a return on only such property as is not only used by the company rendering the service, but is also owned by the company in absolute and complete ownership, the defendants are right and no value can be set down in the inventory on account of these trackage rights, as they are liable to be terminated at any time by the grantor, and therefore have no determinable value; but if the company is entitled to a return upon all such property as is used in the public service, although not held by the company in any greater ownership than such as gives the right of pres-

ent occupancy and use, then the property used in the exercise of these trackage rights should be inventoried and valued the same precisely as property that is both so used and so owned by the company.

On this question I find that the company is entitled to a return upon all the property that is used by it in the public service without regard to the ownership of the property so used. The all important thing that decides whether a given property is to be taken into consideration is, not the ownership, but the use of the property. It is the use that enables the company to perform the service; it is the use that the company sells to the public in performing that service; it is the use, and not the title to or ownership of the property that the public pays for, and it is the use, if anything, that is confiscated by the statute in question. That being the case, the question of the ownership of the property, i. e., the question as to who owns the property is of no consequence or even relevancy to this case. It would not be thought of as relevant to the case but for the fact that nearly all the property used is owned by the company, and also the further fact that, although ownership as regards personnel is of no consequence, ownership as regards value if of very great consequence, as it is the value of the full and absolute ownership of, or estate in, the property that the company is entitled to a return upon in whosesoever hands that ownership may be held. As the use which the company makes of the property is exclusive, it absorbs the rental value of full ownership, and as that rental or use value depends on the value of full ownership, it becomes necessary to determine the value of full ownership in order to determine the value of the use which the company is selling to the public—that value being the price which the public is required to pay. How the

company is able to furnish that use, whether by owning the property or otherwise, is immaterial to the public.

If it be said in this connection that this is a case of alleged confiscation and that the company can have no ground to complain of a confiscation of property that it does not own and that is owned by somebody else, the answer is that the confiscation complained of is not the ownership of property, but of its use. The State, by the action complained of, does not interfere with the ownership or possession of the property in question; what it does is merely to compel the company to give the public the use of the property for a compensation which the company says is so small that the use of the property is thereby confiscated.

In accordance with these views, I find that the property used by the company in the exercise of the trackage rights referred to is properly included in their inventory and that it should be appraised at the value of its full ownership. I find also that this property may be valued according to the value of nearby similar property, and I have so valued it. In my valuation of lands, I have included this right of way at a valuation of $27,023, of which $20,163 is allotted to freight; and $6,565 to common. Testimony was introduced by complainant to prove that this right of way was worth $30,000—the testimony being to the effect that the Lake Superior & Ishpeming Railway Company would willingly pay that amount for it, but I consider the above allowance sufficient and also conservative.

Complainant's inventory contains also another portion of right of way which resembles in some respects the portion above discussed and which is objected to by defendants on the same ground as the latter. It lies in the City of Ishpeming; is 1,250 feet long and occupies land which was formerly a portion of Canda Street. If

the principles above applied to the trackage rights in Marquette are correct, this portion of right of way is clearly includable at its full value even though it were a mere license revocable at will, and had been acquired without cost.

It is not, however, so held and was not so acquired. It was acquired and is held under an agreement with the City of Ishpeming by the terms of which the complainant is given in perpetuity the right to the exclusive occupancy and use of the land in question, in consideration for which the complainant obligated itself to purchase and give to the city other lands to be used as a part of Canda Street, which other lands, the testimony shows, were so purchased and given by the complainant. On these facts, I am unable to see any ground for claiming that this right of way was acquired without cost to the company or to see how it can,—for the purposes of this case, be distinguished from any other right of way owned and used by the complainant.

I have therefore included in the inventory this 1,250 feet of right of way, comprising four-tenths of an acre and have valued it at $4,800, all of which is allocated to common.

Mineral Values in Right of Way.

Throughout the city limits of the City of Negaunee, and from thence through the City of Ishpeming, and for some distance beyond, the main lines of the complainant traverse a well-known and very valuable iron ore formation. Besides these main lines, the complainant owns branch lines which are used to reach mines in operation, and are useful and valuable for reaching any mines that may be discovered in the district. The rights of way for all the lines referred to are perpetual and exclusive, and carry with them the right to the permanent main-

tenance of the surface. Throughout the City of Negaunee the ore is a soft ore which is only economically mined by allowing the surface to cave, following the removal of the ore, thus causing very considerable depressions in the surface. If a railroad lies over such an ore deposit and must be maintained, not only is it impossible to remove the ore which underlies the track, but it is impossible to remove the ore lying on either side of the track for very considerable distances, except at an expense which is practically prohibitive. There are now three main lines of railroad traversing the district. Of recent years it has been almost, if not quite, impossible to obtain the right of way across this district, except the carrier would agree to remove its track to another place if ore was discovered thereunder, which place it must itself acquire, and bear the expense of the removal of the railroad thereto.

Shortly before this suit was commenced, ore was discovered under a track of the complainant, and by agreement the Mining Company procured a new right of way, and at its own expense, transferred the railroad thereto, the distance being some 2.75 miles. The entire expense of this transfer and the cost of acquirement of right of way was fully proved in the evidence. In addition to the evidence of the actual cost of this piece of right of way, there was opinion evidence as to the price at which the other right of way of complainant could be acquired through this mineral belt, considering the value of the lands over which they ran and the probability of iron ore existing therein. The chief witness relied upon was Mr. Belden, who had not only purchased the right of way at private sale, but had acquired, by condemnation, right of way over similar lands in the district.

It is obvious that the right of way over this territory could not be valued by the value of nearby adjoining

mineral lands, because the complainant does not own the mineral, but simply an easement with the right of support. It is equally obvious that this right of way is far more valuable than the adjoining lands valued simply as farming or garden property.

The claim of the complainant as to the nature of these lands and the character of the formation was substantially confirmed by Mr. Allen, the State Geologist of Michigan. From his testimony, it appears that while in some parts of this ore formation the geologist would be more apt to expect ore than in others, that a valuable deposit might be found anywhere.

The character of the ore in the City of Ishpeming is different from that in the City of Negaunee, in that it is a much harder ore, and by leaving pillars of ore the ground may be supported so as to maintain a track, but this can only be done at a loss of 30% of the entire ore body.

The foregoing are undisputed facts and on them the question to be determined is, what value shall be given to those portions of right of way? Shall it be merely the surface value of the lands involved, or shall there be included also an allowance for the prospective mineral value?

Upon this question the defendants claim and argue as follows: "This mineral value is speculative". "Our proposition is that in a rate case values which are speculative merely cannot be included. If at any time it is developed that minerals do exist then is a sufficient time to take into consideration whether they shall be included in the value, but until they are discovered and found to be actually existing, there is no warrant under any circumstances for their inclusion."

This argument involves, I think, an erroneous theory of valuation. It assumes the existence in property of

two distinct and separable kinds of value, viz, a speculative and non-speculative value—a value that includes an element that is prospective because based on anticipation of future developments and a value that does not include such an element.

This assumption is not warranted by economic facts. There is and in the nature of things, must be in every valuation, an element that is prospective and therefore speculative, such a speculative element being nothing more or less than an anticipation or expectation of something to be realized upon in the future. Whether this expectation will in fact be realized is always more or less uncertain and to the extent that it is so, the value is speculative. There is no property the value of which is thus made up of two parts which can for any practical purpose be separated and designated respectively as speculative and non-speculative. The assumption made by the defendants that the value of the mineral prospects is entirely speculative, and that the value of the surface rights is entirely non-speculative is unfounded. The one value may be more of a speculative nature than the other, but the difference is only one of degree, and not of kind. Of course, the mere surface rights can be valued separately from the mineral rights, but the value thus given to the surface rights is itself affected by prospects and therefore speculative in various respects, among which is this very contingency of mineral development by reason of which when all mineral rights are thus reserved the surface rights are liable to become nearly or quite worthless in consequence of cavings resulting from the exercise of the reserved right to remove the minerals. There is also in the surface value a very considerable speculative element from the fact that some of the land has a prospective value for building lots, which depends on city growth.

The above quotation from defendants' brief is under the heading "Speculative Values not proper for Inclusion in Rate Cases." Further on in their brief they repeat this proposition and in argument thereunder shift their ground; they say

"The value of the mineral prospect is properly includable in eminent domain proceedings", but "In a rate case, however, the existence of the property being used must be proven as a fact and it is not sufficient to speculate upon the probability of the existence of property or its value. In other words, the railway company must make out a clear case, must show the property and the value which it claims to exist beyond a doubt."

It will be noted that under this same heading, the defendant previously argued that speculative values should be excluded because they are speculative; and that here it is argued that they should be excluded because they cannot be proved with sufficient certainty to satisfy the requirements of a rate case. It will be seen also that the latter argument involves an abandonment of the former. According to it, the question is one of the sufficiency of evidence rather than of kind of value, and the claim is that speculative values are so uncertain that they cannot be sufficiently proven in a rate case although they can be in a condemnation case, because it is said the requirements of certainty are greater in the former than in the latter; and in support of this position they say "it is not every value which is proper in a condemnation proceeding that may be included in a rate case; thus in condemnation proceedings the severance damages are proper to be taken into consideration while they are not properly added to the value of the property in determining the sufficiency of rates."

This clearly involves a confusion of thought between value and damages. The amount allowed to an owner for

severance damages in condemnation proceedings is so allowed not as an increase in the value of the property taken, but as compensation to the owner for a diminution of the value of his remaining property not taken. Such severance damages are in neither case "added to the value of the property", and the assumption that they are so added in a condemnation case, although they cannot be in a rate case is unawarranted and argument based thereon that speculative values are not includable in rate cases, although they are so in condemnation cases is therefore without force.

In addition to these two distinct grounds for the exclusion of mineral values, the defendants allege a third, as follows:

> "It is not as though the complainant were now called upon to acquire this property. It owns it and has owned it for a long period and its predecessors acquired it gratis from the State at a mere nominal figure (with the exception of 2-6/10ths miles acquired without cost to it). Under these circumtsances where the value of the ore or of the prospect of ore as now claimed did not enter into the cost of acquisition, it is unfair to the public to pay a return upon a speculative mineral value, the possibility for whose existence is remote."

If this argument were sound, and its statements of facts true, it would not only exclude all value for this right of way, but would also put an end to the case. It assumes that it is actual cost that determines the amount upon which complainant is entitled to a return, whereas such cost has not been shown in the case, except incidentally here and there, but on the contrary the case has proceeded entirely on the theory that the amount on which complainant is entitled to a return is present value

estimated on the basis of reproduction or replacement cost. The argument has no more or other application to mineral values than to other values. And as to its statements that this right of way was acquired gratis or at nominal cost, the evidence does not so show, but on the contrary does show that the 2-6/10ths miles referred to was purchased by giving in exchange for it another right of way which must be presumed to have been of at least equal value, since the purchasers were willing to pay for it the amount that it cost them to furnish the complainant's present right of way.

I have thus considered these three arguments at length because they were strenuously urged, but in my judgment all of the questions raised by them are effectually settled by the Minnesota rate decision where it is held that the kind of value to be determined is market value. Whatever elements of value are included in the market value of this right of way, as such value is shown by the evidence, must necessarily be included here. It is the judgment of the buying and selling public that determines the market value, and if that judgment is that the value of the property is enhanced by its mineral prospects, it is, in fact, so enhanced, whether such judgment is wise or foolish—whether the prospects do or do not justify the estimate of an enhancement of value.

Under the rulings of the Minnesota rate decision, it seems clearly to be my duty to find the market value of this portion of right of way and include it in the valuation without undertaking to analyze and differentiate between the different elements of value that enter into that market value. This I have done, as specifically explained in the detail of land values in Marquette County, and the value of lands there fixed through the mineral belt, I believe to be fair and conservative.

With this explanation relative to parcels of land hav-

ing special features, I proceed now to the general valuation of the complainant's lands.

I find the total value of the lands of the complainant in the State of Michigan, in railroad use, to be $1,780,239, of which amount $142,679 is the value of lands used exclusively in the passenger business, $1,025,228 the value of the lands used exclusively in the freight business, and $612,332 the value of the lands used in common freight and passenger.

Practically without exception, the allocation of the lands to the services was agreed upon between the parties to this suit.

The following is a schedule showing my valuations by counties and the allocations to the different services:

Counties	Pass.	Frt.	Com.	Total
Chippewa	$ 31,372	$ 34,501	$ 40,805	$ 106,678
Mackinac		47,863	41,630	89,493
Luce		549	5,818	6,367
Schoolcraft		7	3,118	3,125
Alger		38	4,252	4,290
Marquette	111,307	897,229	360,776	1,369,312
Baraga		6,757	17,419	24,176
Houghton		32,591	106,308	138,899
Ontonagon		4,317	25,125	29,442
Gogebic		1,376	7,081	8,457
	$ 142,679	$1,025,228	$ 612,332	$1,780,239

I have attached hereto an exhibit on which I have given the value as I find it of every parcel of land therein described, assigning the value to the different services according to the agreed allocation. In general, my exhibit in its descriptions is a copy of complainant's inventory of its lands in Michigan as contained in its Exhibit 1-C, but I have been obliged in some instances to change

the descriptions because I could not otherwise apply the testimony as to values. This statement is particularly applicable to the descriptions in the Village of Baraga.

I proceed to make such comments on particular valuations as seem to me desirable.

Lands in Chippewa County.—Sainte Marie Union Depot Company.

In this county is situated the property of the Sainte Marie Union Depot Company, which is controlled by the complainant railroad and the Minneapolis, St. Paul and Sault Ste. Marie Railroad Company by stock ownership, each owning one-half of its stock. The depot property is not operated for profit, but the owning companies share the expense of operation in proportion to their respective use thereof. It is agreed between the parties that one-half of the value of this property should be included in the complainant's inventory and appraisal as part of the property owned by it, and the lands of this depot company are therefore included in the complainant's inventory.

The value of this terminal property is very large and very much in dispute. To prove its value, the complainant produced John G. Stradley, who was and long had been a resident and real estate owner and dealer in that city, and who showed himself very familiar with the value of this and adjacent properties, he having himself purchased very considerable quantities of land in the immediate vicinity and adjoining the terminal property. Basing his judgment upon these purchases and his knowledge of sales of other nearby property, he fixed the value of the terminal property at approximately $198,000.

Witnesses engaged in the real estate business produced by the defendants fixed very much lower values, so much so that the defendants' claim that the value of complain-

ant's interest in this terminal property is much less than its cost when purchased by the Depot Company in about 1899.

It is undisputed in the case, however, that the property was acquired as the result of the efforts of the citizens of Sault Ste. Marie to establish the freight and passenger depot as a more convenient location, and that the citizens undertook to furnish part of the land, to raise some money to pay for land and that the prices were made very low by some owners as part of their subscription towards getting the depot moved. Notwithstanding these facts, the land cost the Depot Company $38,000.

Mr. Snell, a witness produced by the defendants, testified that property nearby the depot property increased from two to three times what it was worth before the depot's location was changed, and that notwithstanding that there had been a very considerable falling off in real estate values prior to the time that he testified, property nearby was still worth two or three times more than when the new depot was established.

In view of these facts, and the conflicting testimony, it is difficult to form an entirely satisfactory estimate of the value of this property. However, I think that a great part of the difference between the estimates is due to different methods of valuation—that the defendants' witnesses valued on the basis of what they judged the land would have to be sold for, if thrown on the market in bulk, the depot being removed, while the complainant's witnesses valued on the basis of what it would cost to acquire the property at market value, judging from values and sales of adjoining similar property. Of these two methods, I think the latter is more correct for the purpose of a rate case. I think also that Mr. Stradley had such intimate and thorough knowledge of property values in the vicinity as specially qualified him to judge of

this property, and that his valuation made on the above basis, although much greater than that made on the other basis, is fairer and more reasonable than the other. I think, however, that it is too high and after much careful consideration have decided to place the value of this terminal property at $137,741.

Other Lands in the City of Sault Ste Marie.

Besides the property of the Sainte Marie Union Depot Company which I have already considered, the value of the complainant's lands in the City of Sault Ste. Marie are much in dispute. I have had great difficulty in deciding upon these values. Mr. Stradley was the only witness produced by the complainant, while the defendants produced dealers in real estate whose values were radically lower. The method of valuation adopted by Mr. Stradley was substantially correct, that is, he undertook to apply the value entirely upon recent sales of nearby lands. I am not, however, convinced that Mr. Stradley had a sufficient number of sales to establish from such sales a fair average value of the railroad lands. On the other hand, it was evident that the witnesses for the defendants applied to the railroad lands wholesale prices as though these lands were in the market to be sold in bulk. After careful consideration of the evidence, I have fixed values which are materially lower than Mr. Stradley's and in some instances very considerably higher than those fixed by defendants' witnesses, but which, I believe to be conservative and fair to both parties.

Mackinac County.

In this county I have fixed the values as claimed by the complainant because the witnesses produced by the complainant were, in my judgment, better qualified to judge and possessed a more thorough knowledge of values than

those produced by defendants, especially in respect to land values in St. Ignace where the most valuable property of complainant in this county was located.

Luce and Alger Counties.

In these two counties there is no substantial dispute between the parties as to the value of the property.

Schoolcraft County.

I have fixed a value of $5.00 per acre for the rural lands in this county, which I believe is a conservative valuation.

Marquette County.

In the City of Marquette, I have, in general, followed the valuation fixed by complainant's witness, Mr. M. E. Asire, because I am convinced from the whole testimony in the case that by reason of large experience in the real estate business in Marquette, his intimate knowledge of local conditions affecting values there, and his evident desire to be fair that his valuations were reasonable and conservative.

I think, however, that in valuing item 29 in the City of Marquette, Mr. Asire's method of valuation was not upon correct lines and I have materially reduced his valuations of that item accordingly.

Mineral Lands in Marquette County.

I have already treated of the situation and complexities involved in the valuation of this property. The value of the ownership here involved is very hard to estimate. That ownership consists of two general rights, viz., the right of way over the surface and the right of support thereof, i. e., the right to protection against cavings, resulting from the removal of ore from under-

neath. The value of these two rights to the company and the public which it serves is necessarily the amount that it would cost to acquire them, provided that amount is not so great as to be prohibitive. Upon the question of the amount of that cost, we have only the testimony of Mr. Belden, a resident lawyer, who had had much experience in dealing with such rights of way and who based his estimates of value upon his knowledge of what it had cost to acquire other similar rights in the vicinity—a method of valuation which seems to be in substantial harmony with the principles laid down in the Minnesota rate decision. That Mr. Belden was as well qualified as anyone could well be to make such an estimate and that he was honest and fairly conservative there is no room for question. As Mr. Belden's is practically the only testimony on this particular subject, the valuation of this portion of right of way (unless mineral rights are entirely excluded) is to be made on the basis of his estimates and I have therefore made my valuations accordingly, but with certain reductions from his estimates made in order to be safely conservative. On all main line properties, I have adopted his value reduced by 25%.

With reference to all mine branches, I have fixed a value not exceeding $500 per acre. This I have done, not because there is anything tending to show that these lands could be presently acquired at less prices than those fixed by Mr. Belden, but because I doubt whether such prices would not be prohibitive—whether any railroad company could afford to, or would, pay such prices for any considerable quantity of land, the use of which would be confined to mine branches.

Baraga County.

With reference to the value of the lands in the Village of L'Anse, there was a sharp dispute between witnesses.

I have fixed values there which I believe are conservative, and give due consideration and weight to conflicting opinions.

In the Village of Baraga, I have, in general, adopted prices fixed by the witnesses for the defendants.

From the Village of Baraga to the Houghton County line, I have fixed values which are somewhat less than the weight of the evidence would perhaps justify. I have done this because I could see no good reason why these rural lands should be worth very much more than rural lands in Houghton County west of Nestoria or in Ontonagon County, the element of probable value as sites for lakeside or summer resort cottages seeming too remote for consideration here.

Land West of Nestoria in Baraga, Houghton, Ontonagon and Gogebic Counties.

The values which I have fixed on rural lands from Nestoria west to the Michigan and Wisconsin State line are such as do not, in general, exceed the value of nearby or adjoining stump lands, and those fixed by me in Ontonagon County are not greater than would, I think, be justified by the testimony of the defendants' witness, Mr. Garvin, with reference to lands in that county.

To my views on land valuations as above expressed defendants' counsel made numerous objections. To some of these objections I will, for the sake of clearness, make answer here. The answers to the others will be found in connection with the objections in the Appendix.

Insofar as defendants' counsel assert (Objection 5 a-1) that I allowed a strategic value for any lands, he is in error. No allowance was anywhere made for strategic value. On two parcels of land a special value was al-

lowed, as hereinbefore explained, but that special value was not on account of any strategic advantage, but on account of their special adaptation for railway purposes. It was a value which inhered in the land itself and would exist in the hands of any owner of the particular parcel of land, and which the owner would presumably receive on a sale, and certainly would be entitled to receive in condemnation for railway purposes.

Defendants' Objection 5 (a) (2) assumes that my findings include a value for riparian rights in lands whose reparian rights are not in railroad use. This assumption is incorrect. All of the riparian rights for which a value was included in my land valuations were found by me to be in railroad use in the manner and for the purpose specified in connection with those valuations.

The question whether the complainant would be entitled to include in its land valuations the value of water rights not actually used by it either for protection of water rights which it does use or otherwise, but which rights are cut off from actual use by the manner in which the lands to which they are appurtenant are put to railroad use, does not arise in this case, unless I am wrong in finding that the control of the water rights of all of the lands included is thus needed for protection.

Defendants' Objection 5 (a) (4) seems to intend to assert or imply that my findings undertake to determine and allow ore values, or values due to ore or other mineral prospects. If such is the intention, counsel are in error. The lands were valued at their market value as shown by the evidence. Whether any, or if so, how much of that market value was due to the existence of ore or ore prospects was not considered by me, and was not within my province for consideration. That my method of valuing lands having mineral prospects was correct I

think is fully sustained in *Montana Railway Co. vs. Warren*, 137 U. S. 348.

Defendants' Objection 5 (a) (5) asserts that my "land values, generally, are excessive and contrary to the weight of evidence." This objection is so extremely general that it is impossible to discuss it. The same is true, in varying degrees, of a considerable number of the objections which follow. This I very much regret, for the reason that I have been not only anxious to consider all supposed errors in my findings, and to correct all real errors, but anxious also to give full and fair consideration to every objection. But where the objection is of such general character I am able to do neither. There are one hundred and sixty-one separate descriptions of land embraced in the valuations, and as each is valued separately, there are hundreds of different "land values" to each and all of which this objection applies. Upon comparatively few of these specific parcels has there been any discussion in briefs or oral argument as to their value. Counsel on each side, in general, contented themselves with discussing the principles to be used in valuing the different classes of land. They respectively furnished me a list of lands with the value they claimed for each parcel, together with references to the testimony claimed to sustain their valuations.

I do not complain of this method of procedure because probably it was the only feasible one which would not make briefs and oral argument unreasonably long. It enabled me to consider the testimony with a fair probability of missing none that was material, and I have considered it. I saw each witness and I have used my best judgment not only in determining the witness or witnesses best qualified to establish the value of each particular description, but also in applying the testimony to each parcel involved.

Yet this objection asserts that each of the valuations is excessive and not supported by the testimony, and at the same time fails to state what the defendants claim that any of them should be. Such an objection it is clearly impossible to discuss. And if it could be discussed, it could not possibly be met, for if every valuation were reduced in response to it, such reduction might or might not be sufficient to satisfy the objection, because there is nothing to show what reduction the objection claims should be made.

Defendants' Objection No. 5 (b) (1) asserts that lands in considerable or large tracts are considered and valued upon the basis of adjacent or nearby lands subdivided into small lots and upon the basis of an immediate sale of the whole of such lands at the values or prices which were paid for a small number of lots out of a large number in the vicinity.

No lands were valued by me on the basis described in this objection. The lands were valued by me upon the proved market value of similar adjoining, adjacent, or nearby lands upon the assumption that it would cost the complainant that amount to presently acquire such lands either by purchase or condemnation.

Defendants' Objection No. 5 (b) (2) asserts that in my valuation the assumption is given effect that there would be an immediate demand, at high prices, for all of the South Shore lands now occupied by the railroad. No such assumption was either made or given effect by me.

It is asserted under subdivision (3) of the objection last named that

> "the detrimental effect of the railroad, as giving a lower value to lands in its immediate vicinity for other than railroad purposes, was not taken into account, in that the railroad lands were considered of the same value as, and compared with, residence and

high class property located in the better parts of municipalities where those lands lay."

I uniformly took into account the detrimental effect of the railroad upon the lands in its immediate vicinity, and the same is reflected in my valuations wherever such effect was found by me to be shown by the evidence.

Subdivision (4) of this objection asserts that

"principal and important streets in municipalities were assumed to be projected through and onto the lands of the complainant, and the further assumption was placed that there would be an immediate demand for all the railroad lands thus assumed to be on such streets for the same uses as the occupied lands now on such streets or in the vicinity."

None of my valuations were based on either of the assumptions mentioned. The objection could apply only to the passenger station property at Marquette on Front and Third Streets and property adjoining on the west, between Third Street and Fifth Street. The testimony as to the division of that property by the opening or extension of certain streets was considered by me only in determining that this property was similar to the adjacent and nearby property, and therefore comparable in value.

Subdivision (5) asserts that I adopted values which are based upon purchases for railway purposes, resulting in the inclusion of the values and elements of value for railway purposes forbidden under the Minnesota rate cases.

None of my valuations were based upon purchases which included values or elements of value for railway purposes which are forbidden by the Minnesota rate cases. In the two cases hereinbefore mentioned I did find that the lands had special value by reason of their adapt-

ability for railroad use. Such method of valuation is not forbidden by the Minnesota rate cases but expressly allowed.

There were other objections to my land valuations, but these are all that I consider it necessary to here treat.

Schedule 3.—Grading.

Under the general heading "Grading", the valuation engineers employed by the respective parties, following the classification laid down by the Interstate Commerce Commission for construction accounts, included a number of different items as follows: (1) Grading proper, being the cost of moving materials used in the construction of the roadbed, including earthwork, solid rock and loose rock; (2) clearing and grubbing; (3) corduroy; (4) riprap; and (5) retaining walls.

I follow their classification in making my findings. I have fixed the value of the items contained in this schedule and also of all succeeding schedules, as of June 30, 1913, that being the latest date on which figures have been submitted to me.

Grading.—The Riggs and the Hansel estimates of quantities of materials moved in grading are not far apart, Hansel's figures being somewhat less than those of Riggs on earthwork, but somewhat greater on rock. There is also a difference between them, due to the fact that Riggs estimated grading quantities on all branch lines, while Hansel estimated no grading quantities on those branch lines the grade of which is not owned by the complainant. If the grading quantities on such branches are deducted from the Riggs' 1913 totals as is conceded by the complainant should be done the total of Riggs' grading quantities including earthwork, solid rock, loose rock, shrinkage, overhaul, grading on crossings, depot grounds, etc., would be 7,651,461 cubic yards. The Hansel

total for the same items is 7,557,800 cubic yards. It appears from the testimony, however, that subsequent to the Hansel appraisal there was a large amount of earthwork added to the complainant's road by the filling of a number of trestles, the added quantities by reason of the filling of these trestles being 131,500 cubic yards. If this yardage is added to the Hansel 1912 estimate to reach the correct figures for 1913, the grading quantities, as found by Hansel, would be 7,689,300 cubic yards, or considerably in excess of Riggs' as corrected.

I have therefore taken the grading quantities as found by Riggs in 1913, corrected by deducting for branches, the grade of which is not owned by the complainant, and I find the quantities to be as follows:

	Cubic Yards
Earthwork, including shrinkage, overhaul, grading crossings, etc.	7,404,489
Solid rock	67,628
Loose rock	179,344
Total	7,651,461

Mr. Riggs and Mr. Hansel agreed as to the proper unit prices for solid rock and loose rock, but differed as to the unit price on earthwork. Mr. Riggs used a unit price for earthwork of 30¢ a yard, while Mr. Hansel used a price of 20¢ for sand; 40¢ for earthwork at sink holes, and 26¢ for other earthwork, his average price being 25.6 cents. All the other witnesses who testified on this point, agreed that 30 cents a yard was a fair and conservative price for earthwork in the territory through which complainant's railroad runs, where, on account of the rugged country, the short working season, and the severe climatic conditions, the cost of the work would be much greater than in most other parts of the country. For instance, Mr. Hogeland, the chief engineer of the Great Northern Railroad, testified that while the average price of such

work on that road was 19.3 cents a yard, yet the average price of such work in Northern Minnesota, a country very similar in physical and climatic conditions to the Upper Peninsula of Michigan, was 36¢ a yard.

Mr. Loweth and Mr. Young, both of them with large experience in construction work in the Upper Peninsula of Michigan agreed that 30¢ a yard would be a reasonable price for this work.

In view of all the testimony which corroborates Mr. Riggs' estimate of the proper unit to be used, and in view of the fact that the Hansel price is supported by the testimony of no other witness, and the only basis for the same, as shown by the record, is his opinion, based on his own experience, none of which experience, as admitted by him, was gained from work in the Upper Peninsula of Michigan, I find that the Riggs' price for earthwork should be adopted, and I have adopted it, together with his prices for rock, which agree with those of Hansel.

The valuation of this subdivision of the schedule, with the allocations to the different services is as follows:

Freight	$ 204,381
Common freight and passenger	2,197,937
	$2,402,318

Defendants' Objection No. 5 (c) (3) asserts that I "assumed that to reproduce the earth grading upon the complainant's line and right of way would cost thirty cents per cubic yard, whereas the true cost to reproduce, and the real reproduction value, is much less, and does not exceed an average of twenty-five cents per yard."

"The price adopted for grading is higher than prices paid by the South Shore on its line in recent years, and higher than that shown by the majority of bids on twenty-five miles to be constructed for the Chicago, Milwaukee and St. Paul in the vicinity."

I assume that where this objection says I "assumed" that to reproduce the earth grading upon complainant's right of way would cost 30¢ per cubic yard, it was meant to say that I "found" that to be the cost—the fact being that I found from the testimony that such would be the cost, and in connection with such finding, discussed the testimony on which the finding was based. That finding is now objected to on the ground that it is "higher than prices paid by the South Shore on its line in recent years, and higher than that shown by the majority of bids on 25 miles to be constructed for the Chicago, Milwaukee and St. Paul Ry. in the vicinity, and it is claimed that because certain grading had been done on these roads in recent years at a less cost than 30¢, the allowance here should be much less than 30¢, and should not exceed 25¢—in other words that those specific instances of a less cost than 30¢ outweighs the opinion evidence of all the witnesses except Mr. Hansel, and requires the fixing of a price lower even than that fixed by the latter.

To judge of the validity of this claim it is necessary to examine these specific instances of cost and inquire whether they are entitled to such weight as evidence of the average cost of grading the complainant's entire line. I find in the testimony proof of only three contracts for grading, viz: one in 1904, where the price was 26¢ for earth and 40¢ for hard-pan, one in 1907 and one in 1909, in each of which the prices were 35¢ for earth and 50¢ for hard-pan. I assume that these are the contracts referred to in the objection, but am unable to see in these contracts any tendency to prove that the allowance of 30¢ is too high, especially as that allowance includes the moving of hard-pan. The other piece of work probably contemplated by the objection and mentioned as having been done on complainant's road, is the 2.6 miles of new road constructed by either the Cleveland-Cliffs Iron Company

or the Lake Superior & Ishpeming Railway in 1911, and afterwards turned over to the complainant. The grading on this piece of road was done at a cost of 28¢, including some rock. To what extent the cost of grading this small piece of roadway should be taken as proving what would be the average price of grading the complainant's entire line would depend on the extent to which the conditions affecting cost are the same in the two instances. As regards the identity of those conditions, there is no direct testimony, but some indirect. This particular grading was done under the direction of the witness, Mr. Young, he being the chief engineer of the Lake Superior & Ishpeming Railway; and he must therefore be regarded as the most competent person to testify as to the identity of conditions and the consequent extent to which the cost in this instance can be taken as proving the average cost on the entire line. He does not, in his testimony, compare the conditions in question, but he states by necessary inference that the grading cost in this piece of roadway is not to be taken as showing the average cost on complainant's entire line. In answer to a specific question calling for his opinion as to the average cost of grading the entire line, he fixes that price at 30¢. There is no question of Mr. Young's fairness and reliability, and I am satisfied that the difference of 2¢ between this specific cost and the 30¢ average cost is due to differences in conditions. Certainly the specific instance of cost cannot be allowed to outweigh both Mr. Young's testimony and that of all the other witnesses except Mr. Hansel. The other specific instance of grading cost referred to in the objection is similar in effect to that last mentioned,—the engineer under whom the work was done being a witness in this case and testifying that the average cost of grading on complainant's entire line would be 30¢ or more; and

in this instance, the witness testified as to the identity of conditions, to the effect that they were not the same, and explaining that the price there paid was exceptionally low for reasons which he mentioned.

After a careful examination of the objection, I am unable to come to any other conclusion from the testimony than that I have hitherto expressed.

Clearing and Grubbing.—Of the 419.61 miles of main line right of way owned by the complainant in Michigan, it appears undisputed from the testimony that with the exception of 14.88 miles of open swamp, the entire right of way in its original construction required clearing and grubbing.

Messrs. Riggs and Hansel, the engineers employed by the complainant and the defendants, respectively, on the reproduction theory, felt compelled to estimate clearing and grubbing, not upon the amount which was originally required in the construction of the road, but by an estimation of the amount which would now be required, based on the condition of the lands adjoining the right of way.

On this method, Mr. Riggs, for the complainant, estimated that 85% or 4,098.42 acres of main line, outside of cities and villages, would require clearing, and that 40% of the cleared area would require grubbing, the combined cost of which he estimated at $80 per acre for the acreage above named, being $40 an acre for clearing and $100 an acre for grubbing.

Mr. Hansel, in his inventory, estimated considerably less quantities both of clearing and grubbing, although he agreed with Mr. Riggs in the unit prices which should be applied.

In January, 1914, Mr. Cadarette went over the entire main line to determine the exact conditions of the road as to the amount of clearing and grubbing which would be required on a reconstruction judged by the condition

of the lands adjoining the right of way. He testified that of the 419.61 miles of main line, 40.83 miles were cleared in cities and villages, 39.22 miles were cultivated or capable of cultivation, 14.88 miles were open swamp, and 324.68 miles would require clearing and grubbing. The acreage, therefore, requiring clearing at that time, at 12 miles to the acre, was 3,896.16 acres.

I am convinced that Mr. Gadarette's investigation was carefully and correctly made, and I accept its results as to the number of acres upon which clearing must be estimated.

When we come to the question of grubbing, we find a disagreement between the engineers as to the proportion of the cleared area requiring grubbing. Mr. Riggs' estimate was that this percentage would be 40%. Mr. Hansel gave no percentage but by comparing his allowance for the number of acres requiring grubbing with his acreage allowance for clearing, we find that his area requiring grubbing was 29.88% of his acreage requiring clearing.

I am not satisfied that the Riggs' estimate of the percentage of grubbing required is any more correct than that of Hansel, and I have adopted the Hansel percentage of 29.88% which I have applied to the 3,896.16 acres requiring clearing as found by Cadarette and adopted by me. This acreage requiring grubbing would be 1,164.17 acres.

Mr. Riggs computed clearing and grubbing on branch lines in the same manner as for main line, except that he estimated a 50-foot instead of a 100-foot right of way, making an acreage of six acres to the mile.

I have not been able to accept the estimates of either Riggs or Hansel on the clearing and grubbing on branch lines, as the figures of both are excessive. On some of the branches which they included, the grade was not

owned by the complainant; other branches are in territory where I have valued the right of way as improved lands, being branches in cities and villages, and the mining district. This leaves only four branches on which I have allowed clearing, viz: the Fiborn Quarry, Hunter, Arnheim and Bessemer branches, with a total acreage of 70.55 acres of which acreage 29.88% or 21.08 acres would require grubbing. I have figured clearing and grubbing on this acreage at the same prices used on the main line.

The theory on which the complainant claims this allowance for clearing and grubbing is that the land in the right of way should be valued on the basis of reproduction cost, and that such cost is to be ascertained by estimating the cost of acquiring the land in the uncleared and ungrubbed condition in which the adjoining lands now are, but without timber value, and adding thereto the cost of clearing and grubbing.

The theory on which the defendants claim that no allowance for clearing and grubbing should be made is that under the decision in the Minnesota rate case, the lands in the right of way cannot be valued in this way; that the Federal Supreme Court there laid down a general rule on this subject which restricts the value of the land in the railroad right of way to a certain maximum, such maximum being the value for other purposes of adjacent or nearby lands of a similar character, and that the right of way in question must therefore be valued on the basis of the value for other purposes of the agricultural lands in the vicinity that have been cleared and grubbed, even though that value might, in many instances be much less in amount than the cost of clearing and grubbing alone. According to this claim, it will be noted clearing and grubbing is not to be treated as an item of cost in the construction but as work that had been

done on the land previous to its acquisition and the cost of which, therefore, has been merged in the land value and been paid for in the amount paid for the acquisition of the land.

Which of these claims should be sustained? What we are here trying to do is to estimate the cost of reproducing the property; and for that purpose we are employing a hypothetical reproduction; and the precise question raised by these claims is whether in such hypothetical reproduction we are to assume that the land on which the roadway is to be constructed is in a state of nature or other condition requiring it to be cleared and grubbed or that it has been already cleared and grubbed.

The complainants assume the former; the defendants the latter. Which of these assumptions is correct? Take, for example, a certain mile of the complainant's railroad, running through a forest or through cut-over lands—in estimating its reproduction cost by means of a hypothetical reproduction, which of these two kinds of land is to be taken for the right of way? Or, to put the question in another way, which lands are to be taken and treated as the "similar lands" contemplated by the Minnesota rate decision? There are many kinds and degrees of similarity, and all lands are similar to all other lands in many respects. The lands of the complainant's right of way are similar to both of the two kinds mentioned—similar to the adjacent lands in some respects, and they are similar to the nearby farm lands in other respects, and in many respects they are similar to both. It is evident, therefore, that the similarity contemplated by the Minnesota rate decision is a particular kind of similarity, and it is also evident that it must be a similarity which produces similarity of value—it must be a similarity in respect to those things that determine value.

Now, when we compare the 12 acres in any given mile

of the right of way in question with a similar quantity of nearby farm lands, we find that in respect to the qualities which determine the value of each there is no similarity but a very decided dissimilarity. The qualities which determine the value of the parcel of farm lands are productiveness of soil and convenience of shape for agricultural purposes. On the other hand, these two qualities which are of such value to the farm lands are of no value whatever to the right of way, the first is of no advantage and the second is not only of no advantage, but is a distinct disadvantage.

Turning now to the qualities which determine the value of the land in the right of way, we find that the one all-important quality is its shape and that this same shape which renders it most valuable for a right of way, renders it unavailable and practically valueless as farm lands. The only point of similarity between them that helps to determine value is that both have been both cleared and grubbed and in that respect, they are similar only as regards a part, viz., two-fifths of the right of way—the residue of the right of way being cleared but not grubbed. And this point of partial similarity, it should be noted, is something that does not pertain to the land in a state of nature, but is an improvement made by the hand of man, while the respects of dissimilarity, quality of soil, and extent of length pertain to the land in a state of nature.

On the other hand, in respect to the qualities which determine the value of the land as right of way, the similarity between the land in the right of way and the parcel of adjacent uncleared and ungrubbed land supposed to be taken is complete. The land to be so taken is presumptively the same in all respects as that in the existing right of way, except in respect to the improvements that have been made on the latter; and in estimating the reproduction cost of the right of way lands in

their present condition, it is proposed to take the cost of acquiring land in the state of nature that the adjoining land now is, and add to that cost the cost of making the existing improvements.

That the amount of these costs will be a truer estimate of the cost of reproducing this parcel of right of way cleared and grubbed than would the estimated value of a twelve acre parcel of farm land in the vicinity, cleared and grubbed, there can, of course, be no question. Hence, if this parcel is to be valued on the basis of reproduction cost, the former rather than the latter amount must be taken and the cost of clearing and grubbing must therefore be allowed.

But it is claimed that this parcel of right of way as cleared and grubbed cannot be thus valued on the basis of reproduction cost, that the ruling in the Minnesota rate decision forbids such valuation and requires that it be valued on the basis of the average market value of cleared and grubbed farm lands in the vicinity, and as that value is to be determined by actual sales of such lands, the amount that it would cost to reproduce this parcel of right of way in its present condition as regards clearing and grubbing is entirely irrelevant. In view of this claim, the question of clearing and grubbing becomes entirely a question of the construction of the Minnesota rate decision. Does this decision lay down a rule of valuation that requires this parcel of cleared and grubbed right of way to be valued as claimed by defendants, viz., at the market value per acre of similar cleared and grubbed farming lands in the vicinity? I am unable to see in that decision any intention of laying down any definite rule of land valuation; and I cannot conceive of there having been an intention to lay down the rule that a parcel of land in the cleared and grubbed portion of a railroad right of way is to be valued on the basis of the

value per acre of the same quality and quantity of cleared and grubbed farming lands in the vicinity. There is no relationship or similarity between the two parcels that would make the value of the latter a criterion of the value of the former; on the contrary, the fact is, as already noted, that the qualities which determine the value of the one are qualities which have no effect upon the value of the other, and the values are therefore not comparable. Moreover, if the court did intend to lay down such a rule of valuation, they certainly intended it to be applied only in cases where its application would be reasonable. In the present case, its application would not only be unreasonable, but impossible. It would be so because there are no similar parcels of cleared and grubbed land from which to obtain the average value required for that purpose. There would be no such similar parcels even if this entire parcel of right of way were uniformly cleared and grubbed; and still less would there be such when as is the case here, the parcel of right of way is not all cleared and grubbed, but as regards clearing and grubbing consists of three distinct parcels, viz., a parcel 40 feet in width and a mile long that has been cleared and grubbed and two other parcels, each 30 feet in width and lying on each side of the wider parcel, and each being cleared but not grubbed. To value such a portion of railway property in the manner claimed to be required by the Minnesota rate decision would seem to be a manifest impossibility.

Furthermore, the language of the Minnesota rate decision relative to this subject refers, as it seems to me, to land in its primary and limited sense, i. e., land in a state of nature without improvements; and if that is true, it is decisive of the matter in question, as the land value there would be limited accordingly and the value of the property in its present condition would be determined by

adding to that land value, the estimated cost of clearing and grubbing as proposed to be done in this case.

It is with this understanding of the Minnesota rate decision and of the meaning of the word "land" that I have fixed the land values in the rural right of way in this case where clearing and grubbing would presumably be required in order to reproduce the right of way in its present condition—the word "land" being there taken to mean land in a state of nature or cut over or stump land.

The value fixed by me for clearing and grubbing on main line right of way is $272,263.00 made up of the following items: 3,896.16 acres of clearing at $40 per acre, $155,846; 1,164.17 acres of grubbing at $100 an acre $116,417. This amount is allocated between freight and common freight and passenger as follows:

Freight	$ 5,202.00
Common Freight and Passenger	267,061.00

the allocation to freight being for freight spurs and side-tracks within the main line right of way.

The valuation placed by me for clearing and grubbing on branches is $4,930, all allocated to freight.

Rip-Rap.—Mr. Hansel inventoried rip-rap on complainant's road in Michigan at $4,110, while Mr. Riggs, through oversight failed to include any rip-rap. It is agreed that the rip-rap is there as an element of value, and I have included it at the Hansel figures, and assigned it to the common freight and passenger service.

Corduroy.—Riggs and Hansel agreed as to the mileage of corduroy, but differed as to the proper unit price. Hansel's price being the lower, I have adopted the Hansel price, and his total value of $10,000 and assigned it to the common freight and passenger service.

Retaining Walls.—The difference between the parties on this item is due to the difference in estimating the

cost of reproduction. Mr. Riggs' estimate was of reproduction in kind, while Mr. Hansel's estimate was that some of the stone walls could be reproduced in concrete at less cost. I have adopted Mr. Hansel's views, and therefore his figures of $73,093 for this item.

The allocations are as follows:

Passenger	$ 393
Freight	63,924
Common Freight and Passenger	8,776

Allocations.

I find that the valuations of all the items under Schedule 3 should be allocated to passenger, freight and common, as follows:

Passenger	$ 393
Freight	278,437
Common freigh and passenger	2,487,884
Total	$2,766,714

Schedule 5.—Bridges, Trestles and Culverts.

This is a very long and complicated schedule with many hundreds of different items, and a comparison of the three appraisals is most difficult. Yet as between the 1913 figures claimed by the complainant, and the figures for the same year claimed by the defendants in their latest brief, at page 166, there is a difference of only $4,346, the complainant claiming $455,535 and the defendants claiming $451,189. I do not find that the Riggs estimate, on which the complainant's claim is based, has been shown to be any more accurate than that of Hansel. I, therefore, have adopted the valuations and allocations claimed by defendant. For this valuation Hansel's 1912 estimate is used for a basis, the value of certain timber

reinforcements is added and structures replaced after Hansel's appraisal are deducted at Hansel's figures and the cost of the replacement added at Riggs' 1913 figures for the new structure.

The allocations are as follows:

Freight	$ 12,949.00
Common freight and passenger	438,240.00

Schedule 6.—Ties.

The two appraisals do not differ materially as to quantities of ties, Hansel's quantities being slightly in excess of those of Riggs. I have taken Riggs' quantities, corrected by deducting his estimate of ties on the branch lines, above referred to under Schedule 3, which are not owned by the complainant.

The principal difference between the two appraisals is as to the percentage of condition. In my judgment the weight of the evidence supports Mr. Hansel, and I have therefore adopted his percentage of condition, 55%, rather than the higher estimate of Riggs.

Both engineers agree on a unit price of 40 cents, that being the average price paid by the complainant for all ties purchased during the latest five-year period, 1909 to 1913, including an allowance of 7 cents per tie for inspection and handling.

Defendants, under their Objection No. 5 (c) (4), criticise my use of 40 cents as the basic price for ties, although this is the price that their own witness, Mr. Hansel, fixed. Mr. Riggs, the engineer of the complainant, in his 1911 appraisal, used a lower price, but in his 1913 appraisal he used 40 cents and testified that in his judgment that was the proper price. So unless there was some mistake made by these engineers, this price is

not fairly to be considered in dispute. Defendants claim that Mr. Hansel did make a mistake, viz: they say, in effect, that he found the average cost of ties for the years 1908 to 1912, inclusive, from the reports of the complainant to the Michigan State Board of Assessors, to be 33 cents, and then added 7 cents thereto to cover inspection, loading and transportation, when in fact the cost of inspection, loading and transportation were already included in the report cost. These reports I have examined, and I find that they purport to show the cost at the distribution point ,and that they show that the true average cost at that point for the years 1908 to 1912, inclusive, was 33.07 cents, and to 1913, inclusive, was 33.22 cents. The question whether this cost covered inspection, loading and transportation depends on the rules of the Interstate Commerce Commission, in compliance with which the accounts of the complainant are kept, and on examination of those rules I find that the price reported is not required to cover loading or transportation, but that it is required to cover inspection. The cost of inspection is shown by the evidence, without dispute, to be one cent per tie. It appears that in fixing the price at 40 cents Mr. Hansel did make a mistake to the extent of one cent, and I have therefore adopted the basic price of 39 cents instead of 40 cents, and have corrected my finding accordingly.

I find the allocations to be as follows:

Freight	$ 27,544
Common freight and passenger	258,918
	$286.462

Schedule 7.—Rails.

The chief differences between the parties on this schedule are as to the unit price and the percentage of condition.

The difference in unit price results from a difference in the method of computing freight rates. Mr. Riggs assumed that the rail would all be delivered at a central yard at Marquette, at a freight rate of $2.35 per ton. Mr. Hansel assumed that the rail would be delivered by water or rail to different parts of the line at an average rate of $1.60 a ton. I am not satisfied that the complainant has met the burden of proof in this regard and have therefore adopted Hansel's unit price of $30.30 a ton. Also it is my judgment that the Hansel method is the more correct for determining the percentage of condition and I have, therefore, adopted on this schedule his figures, corrected by adding the tonnage of rail added to the road after Mr. Hansel's appraisal.

I find the allocations of the items in this schedule to be as follows:

Freight	$ 132,166
Common freight and passenger	1,038,829
Total	$1,170,995

Schedule 8.—Track Fastenings.

I find the total present value of the items in this schedule to be $171,693. I find the allocations to be:

Freight	$ 19,201
Common freight and passenger	152,492

There is no dispute between the parties on this schedule.

Schedule 9.—Frogs, Switches and Crossings.

I find the present value of the items in this schedule to be $123,060. The allocations are as follows:

Passenger	$ 941
Freight	62,074
Common freight and passenger	60,045

There is no dispute between the parties on this schedule.

Schedule 10.—Ballast.

The estimates of the two engineers on this schedule differ as to quantities, unit prices and percentage of condition.

It is claimed by defendants that Mr. Riggs' quantities of gravel ballast per mile are excessive, in that he took the same average thickness as did Mr. Hansel, but failed to allow for the cubic contents of the ties. I find that such is the fact and have therefore taken the gravel quantities per mile found by Hansel and applied them to the graveled portion of the 1913 mileage, and have taken the Riggs' quantities of sand and cinder ballast per mile (the same being less than those found by Hansel) and applied them to the portion of the 1913 mileage that is ballasted with sand and cinders, after deducting therefrom the branch lines, the grade of which is not owned by complainant. I have adopted the unit prices used by Mr. Riggs, which are lower than those of Hansel.

Depreciation of Ballast.

Having determined the quantity of ballast and its cost of reproduction new, we come to the question of its present value, involving the much mooted question, Does Ballast Depreciate? Upon this question the principal expert witnesses for the respective parties are in flat con-

tradiction—Mr. Riggs, for the complainants, saying that ballast does not depreciate and that it should be carried in the inventory at reproduction cost, and Mr. Hansel, for the defendants, saying that it does depreciate and that the cubic feet of ballast now in complainant's railroad is so depreciated from conditions new that its present value is $107,000 less than its reproduction cost.

In this dispute there are two distinct questions involved: First, the general question above mentioned,—Does ballast depreciate? and second, the particular question, If ballast does depreciate, has the ballast that is now found to be in place in complainant's railroad depreciated from condition new, i. e., from the condition that it was in immediately after it was put in place?

The first question depends on what precisely is here meant by the word "ballast". The name "ballast" is applied indiscriminately to ballasting-material in all its various conditions and places, in the pit, loaded in cars for transportation, deposited beside the track at the point of proposed application, and finally placed in position under and between the ties of a railway. Now it is evident that in the three first of these conditions, ballast does not undergo a change that causes depreciation. But whether it does so or not is immaterial here as the depreciation alleged is a diminution in the value of the ballast which it is claimed takes place after it has been placed in the fourth condition and one that must therefore result from a change that takes place after the ballast has been applied and while it is still in place. Does ballast, while it remains in place in a railway, suffer such change and if so in what precisely does that change consist? Mr. Hansel (on whose testimony the claim of depreciation is based) says that such change does take place and states specifically what it is as follows:

"Ballast is somewhat peculiar in its relation to up-

keep, in that it is a never ending cost of up-keep of the track; there is no time in the working season between the time of frost going out of the ground, and the danger, the imminent danger of frost coming into the ground that ballasting is not being carried on even in the very best conditions; there is a constant flow into the property of ballast all the time; it disintegrates, blows away and settles into the embankment, perhaps owing to the character of the soil, it may settle into the earth beneath it, but other classes blow away and are carried away by the elements so that there is a constant stream of up-keep there all the time, and yet it cannot be up to a hundred per-cent."

According to this testimony, then, the change which is suffered by ballast in place or position and which causes depreciation takes place in three ways; viz., by sinking into the embankment, by being carried away by the elements, and by disintegration. Now that some portions of the ballast in a railway do sink into the ground and some are carried away by the elements and that a diminution in value is thereby caused is undoubtedly true, and if this diminution of value can properly be called depreciation and treated as such, then ballast does depreciate.

But can it properly be so called or treated? Depreciation is a diminution in value of a particular thing. It is the difference between the present value and a previous higher value of that particular thing. Now the particular thing under valuation here is the ballast that is now actually in the roadway. If there was formerly a greater quantity there, some portions of which have been lost, that fact alone does not lessen the value of the quantity which remains and which alone we are now valuing. The reproduction cost which we have determined and to which the depreciation, if any is found, is to be applied, is the

reproduction cost of the ballast now actually there, and not the reproduction cost of any larger quantity that may be supposed to have been there formerly and before any was lost. This fact the witness seems to have lost sight of. He apparently assumes that the ballast now there is the residuum of a larger quantity that was formerly there and that in order to reproduce the quantity now there, it will be necessary to first reproduce the former large quantity and then assume that larger quantity to have been reduced by the elements to the quantity now there. Now, this may be a proper line of reasoning if consistently adhered to; but in order to be so, the reproduction cost which is to be reduced by depreciation must be, of course, that of the larger quantity and not that of the smaller. But the witness does not pursue this course—does not determine the reproduction cost of the larger quantity and apply to it the depreciation which he finds to have resulted from diminution of quantity, but instead, he determines only the reproduction cost of the quantity now there, and applies to it the depreciation found to have resulted from the diminution in the larger quantity. This, it is clear, is a mis-application of depreciation in the process of determining present value from reproduction cost.

It is clear also that the question whether this diminution in value resulting from diminution in quantity can be treated as depreciation depends on what it is that is depreciated, and that it can only be treated so when it is the reproduction cost of the larger quantity as it existed before the diminution took place that is taken as the basis from which to determine present value. This being so, it is evident that it is of no consequence here whether ballast can or cannot properly be said to depreciate from diminution in quantity for in either event, the result would be the same, because the reproduction cost

of the ballast now there, undiminished by depreciation, would be the same as the reproduction cost of the larger quantity diminished by the diminution in value resulting from the diminution in quantity.

Unless therefore the ballast now there has depreciated from some cause other than its diminution from a larger quantity formerly there, it has not depreciated at all and its present value is its reproduction cost. Has it depreciated from any other cause?

The only other cause assigned by Mr. Hansel is disintegration, and it remains, therefore, to consider whether it has depreciated from disintegration.

Disintegration is the breaking up of integers into smaller ones. The integers of which ballast consist are bits of stone and grains of sand. Each of these is itself the product of disintegration—the product of rock disintegration caused by the action of the elements. Each represents a stage in that slow geological process by which solid rock is gradually reduced to fine particles of dust, each is slowly progressing toward that ultimate goal. This being so, it is undoubtedly true that there is at all times some disintegration going on in the particles of stone and sand which form the ballast of a railroad bed. But this disintegration is extremely slow and slight, so slow and so slight as to render it impossible to measure or estimate the extent of disintegration that would take place between the time of ballasting and that of reballasting a railway. It would be a manifest impossibility to make at any given time, any rational estimate of the extent to which this process of disintegration had gone forward between that particular time and the time when the ballast was placed there, further than to say that it was practically infinitesimal. And it would be still less possible to make a rational estimate of the de-

preciation in value, if any, that had resulted from such disintegration.

Returning, for a moment, to the question of depreciation in value resulting from diminution of quantity—the impropriety of placing a depreciated value per unit of measurement on a certain quantity of ballast merely because it is not a greater quantity is so manifest that, in fairness to the witness, the reason given by him for so doing should be noted. At pages 1164-5 of his testimony, he says:

> "If the D. S. S. & A. property was today for sale as a going property and if I was called in to tell the proposed purchaser what they would have to spend to put that in hundred percent condition I would have to include something for ballast and that something would be the sum I have set forth here as near as I can judge."

In other words, because it would cost the proposed purchasers a certain amount to add a certain quantity of ballast to the quantity that is there now, therefore, in determining the value of the quantity that is there now on the basis of reproduction cost, it is necessary to reduce the amount of its own reproduction cost by the amount it would cost to add the additional quantity. Whatever propriety there might be in advising a proposed purchaser as stated, there clearly would be none in thus figuring present value on the basis of reproduction cost.

In accordance with the foregoing views, I find that ballast wherever exposed to the action of the elements depreciates slightly from disintegration but that the depreciation from this cause occurring in the ballast of a railway between the time of ballasting and that of reballasting is so slight as to be practically inappreciable;

that the ballast that is placed in the bed of a railway gradually diminishes in quantity by the sinking of portions of it into the ground, and by other portions of it being carried away by the elements, in consequence of which new ballast is required to be added from time to time, but that this diminution in quantity does not diminish the value per cubic yard of the ballast which remains in the road; that the ballast now in the complainant's road has not suffered appreciable depreciation from either of the causes assigned, and that its present value is the amount that it would cost to reproduce it.

I find the allocations of the items in this schedule to be as follows:

Freight	$ 39,393
Common freight and passenger	570,874
Total	$610,247

Defendants' Objection No. 5 (c) (6) relates to the Schedule "Ballast", and the statement is there made that I determined that ballast does not depreciate. This statement obviously is erroneous. I found that ballast does depreciate, precisely as Mr. Hansel said it did: that is, in three ways, viz: by being blown away, by sinking into the embankment, and by disintegration.

Assuming that ballast does depreciate in these three ways, it is only such depreciation as results from the third way, viz: disintegration, that could be allowed for here, as the ballast valued in the inventory is only such ballast as was found in place at the time of the inventory and as it was all there in place, it could not be depreciated by being blown away or by sinking into the embankment. Whatever ballast had gotten out of place in either

of these ways was omitted from the inventory. It follows, therefore, that the ballast contained in the inventory could have depreciated only by disintegration, and I find that there is no testimony showing any amount of such depreciation, and that, in the nature of things, there could be no such testimony, as the depreciation from this cause between renewals of ballast would be too slow and slight to be appreciable, and that it would not be possible for anyone to determine, by examination or otherwise, what amount of depreciation, or that any amount, had occurred from that cause since the ballast was put in place.

Schedule 11.—Track Laying and Surfacing.

This schedule does not embrace any physical property. It consists entirely of labor, viz., the labor of placing in position and fastening the rails and ties, aligning them and providing for them a uniform or uniformly graduated surface on which to rest.

The practical details of this labor are described in the testimony of Mr. Riggs, as follows:

> "After you get the gravel ballast shoved off on each side of the track, it has to be put under the ties. Before it is put under the ties, the material that is between the ties must be removed. In my computations of track laying, and in actual railroad usage, it is usual to skeleton surface or half-surface the railroad that is to be ballasted immediately with the material that the bank is made of, and sufficient of it is put between the ties to hold the track to the line of the grade during the moving over of ballast trains and other construction trains.
>
> After the grade is brought up to the line, the next step in the operation is to put the track on and ties are strung along and the rails are spiked to the ties.

Then the surfacing of which I speak is the putting in between ties of some of the material of which the bank is made, in order to keep the ties in place temporarily until the ballast is applied. It would not be practicable not to do the surfacing at all, but wait until the ballast comes along and save this item of cutting out between ties, for which I charge two cents a yard for the ballast, for the reason that the surface of the grade is so rough that rails would be bent and the damage resulting in the way of injury to the rails would more than offset the expense that is gone to in skeleton surfacing and the cutting out of clay, sand or other material after the ballast is delivered.

It is frequently true that in territory where sand or other favorable material occurs, the ballasting which is done is by casting up of sand or other material from the sides. I would call that surfacing rather than ballasting."

It is the cost of doing this work that constitutes the value of this schedule. Upon the question as to the amount of that cost there is a considerable variance in the testimony, not only between the parties, but between the witnesses testifying on behalf of complainant. The latter are four in number and their several estimates of the cost per mile of track-laying and surfacing are as follows: Riggs, $526; Young, $792; Loweth, $803 and Hogeland $851.

On behalf of the defendants, the only testimony is that of Mr. Hansel, who places the cost at $600 per mile.

In view of the fact that both Mr. Young and Mr. Loweth had had actual experience in such construction work in the Northern Peninsula of Michigan, as well as a wide general experience, and as the cost of such work

is largely affected by local conditions, I regard their testimony on this question as entitled to greater weight than that of either Mr. Riggs or Mr. Hansel, neither of whom had had such local experience; and taking their testimony in connection with that of Mr. Hogeland, I find the weight of evidence to be in favor of a higher cost per mile than that fixed by either Mr. Riggs or Mr. Hansel, but upon the principle of resolving doubts in favor of the defendants, I have adopted Mr. Hansel's figures and fixed the cost at $600 per mile. This is the amount that was claimed by complainant's counsel in their brief and the claim was criticised by defendants on the ground that the amount was never greater than that fixed by one of the complainant's own witnesses, Mr. Riggs. In view of the other testimony on the subject and of the fact that Mr. Riggs states that his price of $526 was a minimum, and that the work would probably cost considerably more than that amount, the criticism does not seem to be well grounded.

I find the total reproduction cost of this schedule to be $277,704, allocated as follows:

Freight	$ 29,442
Common freight and passenger	248,262

I have not allowed the value of track laying and surfacing on any of the branch lines, the grade of which is not owned by the complainant, as the evidence does not show by whom the track laying and surfacing was done.

Defendants' Objection No. 5 (c) (7) relates to my adoption of the unit price of $600, and therein it is claimed that the cost of reproduction of that item is not shown to be in excess of $526 per mile on complainant's railroad.

On a reconsideration of the evidence touching the cost of tracklaying and surfacing, I am unable to reach any other conclusion than that heretofore reached i. e., that $600 per mile is the proper allowance for such cost. This is the price fixed by Mr. Hansel and by all the other witnesses except Mr. Riggs, who fixed a minimum price of $526 and stated that it would probably cost considerably more than that. It will be seen, therefore, that this objection is based wholly on Mr. Riggs' testimony, and that it insists that because he fixed a minimum price of $526, that is the price which should be adopted, notwithstanding the fact that he says it would probably cost considerably more, and the further fact that the testimony of all the other witnesses is to the effect that it would cost $600 or more.

I cannot see how it is possible within reason to give such effect to Mr. Riggs' testimony as to what he considers a minimum price, and therefore see no reason for changing the allowance already made.

The amount thus fixed is also the present value of the schedule unless it ought to be reduced on account of depreciation. The defendants' claim that it should be reduced on account of depreciation by the sum of $63,121—that sum being arrived at, not by inspecting the condition of the work, but by applying to the reproduction cost of the schedule the average percentage of condition of the five preceding schedules, viz, 6, 7, 8, 9 and 10. The precise nature of the depreciation thus claimed is indicated by the method employed of determining its extent, viz, by applying to reproduction cost the average extent of the depreciation found to exist in the several items of physical property which enter into the construction of the structures of which track-laying and surfac-

ing is the completion or last stage of the work—those items consisting of (1) Ties, (2) Rails, (3) Track Fastenings, (4) Frogs, Switches and Crossings, (5) Ballast.

It will thus be seen that the depreciation claimed is of an entirely different character from that with which we have hitherto had to deal, in that it is not a depreciation in the value of a certain physical property—a depreciation that is determined both as to its existence and extent by an inspection of the condition of the property, but a depreciation in the value of certain labor performed in assembling a number of items of physical property; and the depreciation is claimed to exist in the value of this labor, not because the labor would cost any less now than when it was done, or that the work is any less efficient now than before, but because the several items of physical property which were assembled by the work are found to be in a depreciated condition. It is seen, therefore, that the depreciation thus claimed is not an actual, but what might be called a theoretical or putative depreciation—a depreciation imputed to the labor employed in reproducing the property, because in that reproduction it is supposed to be employed on depreciated physical material, and is therefore itself presumed to be depreciated to the level of the depreciated material—on the principle, it would seem of *noscitur a sociis*—it having been found in bad company.

Does the method of determining present value on the basis of reproduction cost call for or justify this curious application of the principle of depreciation?

In arguing that it does, the defendants liken this labor to the labor which has entered into a bridge that has depreciated, and, say, that just as the value of the latter is carried down by the depreciation of the bridge, in like manner and in the same degree, the labor of track laying

and surfacing, is carried down by the depreciation of the materials on which it was employed.

Certainly the depreciation of a bridge carries down with it every value that enters into the total value of the physical structure to which the depreciation is applied, including labor, and with the termination of the life of the bridge, every such value disappears—disappears entirely as an element of value in that particular bridge, although it may still have a scrap value for other uses or purposes. And if there is nothing that differentiates the status in this regard of the labor that has entered into the bridge from that of the labor of track-laying and surfacing that has entered into (for example) a certain mile of the complainant's roadway, and if the reasons for the depreciation of the former are equally cogent for the alleged depreciation of the latter, then the defendants' argument would seem to be sound. Is there such similarity between the two classes?

The purpose of determining depreciation and deducting it from reproduction cost is to determine replacement cost—the cost that is to say, of replacing a thing in its present condition. In the case of the bridge, the replacement can be effected only by the actual expenditure of reproduction cost new, but it is nevertheless presumed to be replaced at the cost of reproduction new less depreciation because the company have, or are presumed to have in a depreciation fund set aside for that purpose out of operating expenses, a sufficient sum to cover the difference between reproduction cost new and present value, so-called, including the portion of labor value which had disappeared.

In comparison with this, the mile of roadway presents an entirely different case. The mile of roadway does not, like the bridge, constitute a structural entity which can be replaced only at a cost of reproduction new of the en-

tire structure and to which in its entirety there can be applied a depreciation which may be called a structural depreciation such as is applied to the bridge—such mile of roadway being rather an assemblage of distinct physical items which are brought together for collective use, each of which is depreciated individually, and each of which may be removed and replaced at any time without interference with any of the other items; and therefore the mile of roadway may by such removal and renewal be kept in such condition that it is at all times just as efficient for railroad use as when first constructed. And so long as it is in fact kept in such condition the mile of roadway is just as valuable as an instrumentality for transportation as if newly constructed, and therefore the labor which created that efficiency by uniting the physical items and placing them in position is just as valuable as when newly performed.

If the complainant's roadway is in such condition, then there is no depreciation which could carry down this labor item which entered into it in track-laying and surfacing. Is it in such condition? Upon this question there is abundant evidence to the effect that it is, and no evidence to the contrary. All of the witnesses who testify on the subject, including Mr. Hansel, agree that the road as an operating instrumentality is in 100 per cent of efficiency. And specifically as regards depreciation in this particular item, both Mr. Riggs and Mr. Hansel testify that it should not be depreciated, giving as their reason therefor that it is a labor item; and their testimony would have been perfectly convincing if they had gone further and explained how it is that this item, because it is a labor item, is not depreciated, although other labor items, such for example as that entering into the supposed bridge are depreciated. The explanation is this: labor value is depreciated in a rate case when found in any item of phys-

ical property against which depreciation is permitted to be charged, and also in all items which can presumptively be duplicated or replaced at a cost represented by reproduction cost new less depreciation, such, for example, as the ties, rails, etc., in the supposed mile of roadway.

Where the item under consideration consists entirely of labor supposedly performed in reproducing the property, as in this instance, there obviously can be no depreciation, for it is labor presumed to be performed in the present.

It must be borne in mind that what we are here seeking to do is to determine what it will cost to reproduce this roadway now in its present condition. We have found from Mr. Hansel's testimony that the labor of track-laying and surfacing will cost $600 per mile; and we are to assume that the depreciated material used can be procured at a cost of reproduction cost new less depreciation. Now, this claim of depreciation would require us to make the further assumption that because the material employed can be acquired at its depreciated value, the labor required which the evidence shows will cost $600 per mile, can be procured at a less cost in proportion to the depreciated cost of the material employed. In other words, if the material employed is in 50 per cent condition we are required to assume that this labor which is appraised at $600 per mile can be procured at a cost of $300 per mile; and if the material is in 25 per cent condition, we are required to assume that this labor can be procured at $150 per mile, and these assumptions are to be made in the face of the fact that the evidence shows affirmatively that the labor would cost $600 per mile and that therefore neither of the assumptions could by any possibility be justified.

Seeing that it involves such impossible assumptions, how could the idea of thus depreciating this labor cost have originated? It arises from a failure to bear in mind what kind of value it is that we are here seeking to deter-

mine. It is another illustration of the confusion that inevitably arises from the failure to distinguish properly between replacement cost value and commercial value, and to bear in mind that it is the former and not the latter that we are here seeking to determine. Estimated on the basis of commercial value, a thing into which labor has entered may not be worth the combined cost of the labor and material or even of the labor alone; but that economic fact has no relevancy here. The entire theory of valuing on the basis of reproduction cost in a rate case is based on the assumption that the property in question is a necessity, and is therefore worth its cost and that cost is therefore the Alpha and Omega of our inquiry. When that cost has been determined the value of the thing, for the purpose of a rate case, has thereby been determined and the inquiry is ended. Whether the thing could then be sold in the market for the amount of its replacement cost is an entirely different question, and one which cannot influence the question of cost in any way. It will, however, help to illuminate the subject to recall to mind that the commercial value of a railroad property instead of influencing cost as this claim assumes, is, in reality, dependent upon and is determined by cost, because it depends upon the rates permitted to be charged and the rates which must be permitted to be charged, under the constitution, depend upon and are determined by the replacement cost of the property.

Defendants' Objection No. 5 (c) (8) relates to my refusal to depreciate Track Laying and Surfacing.

On further consideration of this subject, I can see no reason to change the views expressed in connection with my findings, nor anything to add thereto, except to emphasize the fact that the depreciation here contended for by defendants is not an actual but a theoretical depreciation, and to point out that as such it involves an impos-

sible hypothesis—the hypothesis that the life of the effects wrought by this labor item is co-terminous with the average of the lives of the five classes of physical material which are put in place by this labor item, viz: (1) Ties, (2) Rails, (3) Track-Fastenings, (4) Frogs, Switches and Crossings, (5) Ballast. That this is an impossible hypothesis is perfectly clear. The life of the effects wrought by the labor item obviously bears no relation to that of either of the physical items that would make it coterminous with the life of either of those items; much less does it bear such relation to the average of the lives of the physical items. That the effects of the work of track laying and surfacing depreciate there can be no doubt — those effects are constantly depreciating: but that depreciation is, as I have found in this case, constantly being overcome by further labor as is shown by the testimony, so that there is here no depreciation in fact. And it must be borne in mind that such actual depreciation is something entirely different from the theoretical depreciation proposed by defendants, in that amongst other things, the former is wholly independent of the conditions of the physical items as regards depreciation, while the latter is wholly dependent upon those conditions.

As regards actual depreciation, the effects of the labor item may be greatly depreciated, although the physical items are but slightly depreciated or not at all, and vice versa; but as regards this theoretical depreciation these conditions are exactly reversed; there the effects of the labor are depreciated according to the conditions of the physical items, although there is in fact no depreciation in those effects; and on the other hand, if the physical items were in 100 per cent condition there would be no theoretical depreciation in the effects of the labor, although there might be actual depreciation to the point

of zero. The very next day after the completion of track laying and surfacing, a washout might entirely destroy the effects of the work, and leave the physical items unimpaired. For this reason this theoretical depreciation is one which cannot be rationally entertained.

Furthermore, this theoretical depreciation involves a further impossible hypothesis for the reason that the collective effects of this labor item have no determinable period of life, and therefore none that could possibly be co-terminous with the average life of the physical items or with the life of anything else. The effects of the labor are all the time dying more or less rapidly, according to varying conditions of wear and weather, without any regard to the conditions of the physical items and are therefore all the time requiring to be kept restored, as they are in fact kept restored in this instance. This lack of any determinable period of life is one of the features that clearly differentiate the effects of the labor in constructing a mile of roadway from those of constructing a bridge. In the case of the bridge the effects of the labor employed have a determinable period of life, that period being co-terminous with the life of the entire bridge as a structural entity. When the life of that structural entity terminates, the life of each member as a component part of that entity terminates also. I say "as a component part of that entity", for it is only as such that its life then terminates. It may have a life as something else that does not terminate with the life of the bridge but continues on after the bridge as a structural entity has ceased to exist. Thus, any one of the physical parts of the structure may, when the bridge ceases to exist, still be in good condition and have a second-hand or scrap value for further or other uses, although as a useful element in that particular structure its life is gone. But with the effects of the labor item the case is entirely dif-

ferent. Those effects have no other life than that which pertains to the structural entity of the bridge and therefore have none that can survive the termination of the structure. It is clear, therefore, that the case of the mile of roadway differs fundamentally from the bridge and that in the former there can be no such theoretical depreciation as is claimed.

It may also be added that when the purpose of this valuation is taken into consideration, even where there is actual depreciation, it may be questionable to what extent such depreciation should be considered. If the results of the labor are greatly depreciated, or entirely destroyed by accident or otherwise without fault of the owner as in the case above supposed, it would seem irrational to say that the company should have a return only on their road in that condition.

Schedule 12.—Fencing.

I find the present value of the items in this schedule to be $83,196 and the allocations to be as follows:

Freight	$ 6,296
Common freight and passenger	76,900

There is no dispute between the parties on this schedule.

Schedule 13.—Crossings, Cattle Guards and Signs.

I find the present value of the items in this schedule to be $12,603. The allocations are as follows:

Freight	$ 913
Common freight and passenger	11,690

There is no dispute between the parties on this schedule.

Schedule 14.—Interlocking and Signal Apparatus.

I have adopted the defendants' valuation on this schedule. The amount of the same is $800, and all of it is assigned to common freight and passenger.

Schedule 15.—Telegraph and Telephone.

I find the present value of the items in this schedule to be $37,072. The allocations are as follows:

Freight	$ 516
Common freight and passenger	36,556

There is no dispute between the parties on this schedule.

Schedule 16.—Side Tracks.

The parties differ on this schedule only as to unit prices. After a careful consideration of the testimony, I am not convinced that the complainant has proved the Riggs estimate to be the more accurate and I have therefore, adopted the lower figures of Mr. Hansel and have applied the same to the sidetrack mileage existing in 1913.

The allocations are as follows:

Passenger	$ 7,713
Freight	391,244
Common freight and passenger	153,818
	$552,775

Schedule 17.—Station Buildings and Fixtures.

The inventories and appraisals of complainant's engineer, Mr. Riggs, and of defendants' engineer, Mr. Hansel, were surpisingly close on this schedule, the difference between the two consisting mainly in the value of new buildings constructed after the Hansel inventory. The

defendants, however, offered testimony of two Grand Rapids builders which tended to show that the valuations of both engineers as to this schedule were far in excess of the true values. Thereupon complainant, in rebuttal, offered the testimony of one Rowson, whose qualifications and experience as a builder and estimator, and whose testimony as to his examination and estimate of the values of the buildings in question was so convincing in substantiation of the Riggs estimate, that I could not but find that the appraisal of Mr. Riggs as to this schedule should be accepted.

I therefore found the present value of the items in this schedule to be $143,489, with allocations as follows:

Passenger	$45,844
Freight	38,502
Common freight and passenger	59,143
	$143,489

To this finding in my tentative report the defendants' Objection No. 9 is directed. It consists of two subdivisions, (a) and (b), as follows:

"(a) Passenger stations, at points where there is no exclusive freight building, or where the common agent makes his office in the passenger station and it is essential that the public doing freight business with the road use the so-called passenger station, are assigned in too large a proportion to passenger business, with insufficient separation to freight business."

"(b) An insufficient part of the Marquette station and grounds is assigned to common and freight business, and no part of them is assigned to the Wisconsin business."

"(a)" applies to passenger stations at Wellsburg, Eckerman, Newberry, Seney, Wetmore, Champion, Nestoria and Thomaston. The primary and principal use of the stations at the places above mentioned is for passenger service, but each one of them has in it an office used in some instances by the telegraph operator, and in some instances used also by the station agent in doing some of his freight business. Complainant proved the quantity of floor space in each of these stations occupied by the office, and in proportion to such floor space assigned a part of the value of the building to the common service. I adopted this assignment as correct, and considered it a fair division because, while there was some use of the waiting rooms by the public in sending telegrams, and some use by persons doing freight business with the agent, the part of the office used by the telegraph operator was in most instances a very inconsiderable part. The defendants suggest no method of making a different assignment. I do not feel sure that any different assignment is, within fairness, required, but I have concluded, in order that there may be no question about the matter, to increase the amount assigned to common of the stations above named by 25%.

At St. Ignace, Marquette, Negaunee and Ishpeming there are passenger stations with offices which are used by telegraph operators as well as by the employes engaged in selling tickets, and perhaps also these offices are occasionally used by the agent in transacting freight business. These places are all considerable towns, and each has a freight station with an office where the great bulk of the freight business is done. Because of the difference in the size of the places as compared with the group above treated, it would be manifestly unjust to increase the portion assigned to common by so great a percent as 25%;

I think 10% is a liberal allowance. I have changed my apportionments accordingly.

Referring to the subdivision "(b)" of this objection, the second story of said station is used for a part of the general offices of the road, and the proportion of the value of the whole building represented by such use is, according to the only testimony on the subject (that of Mr. Cadarette) one-third thereof. Of this amount some part should be apportioned to Wisconsin. Such apportionment I have made on the basis of track miles, which gives to the Michigan value $7,523. It appears that of this common portion of the building, a certain office, amounting to 14½% of the total office space, is used by the car accountant, and it is defendants' contention that as his duties are concerned almost entirely in keeping track of freight cars, such portion of the value should be apportioned to freight. I find that this contention is well founded, and that the proportion of such value would be $1,091.

I have changed my valuation and apportionment of this schedule in accordance with the above views, with the result that I find the present value of the item "Property attributable to Michigan", to be $141,904.

The allocations are as follows:

Passenger	$43,864
Freight	38,502
Common freight and passenger	59,538
	$141,904

Schedule 19.—Shops, Engine Houses and Turntables.

It is the complainant's claim that this schedule should be valued on the basis of the Riggs' 1913 appraisal, while defendants contend that the Hansel 1912 appraisal should

be taken as the basis, and to reach the proper valuation, there should be added to the Hansel appraisal the additions to the property made in the fiscal year 1913, and there should be deducted any property valued by Hansel and abandoned in 1913. I have concluded to adopt defendants' method for the reason that I find no corroborative testimony which justifies me in taking the Riggs' higher values in 1911, rather than Hansel's valuation in 1912.

I find, however, on computing the additions and deductions, that the figures claimed by defendants in their brief are incorrect, both as to additions and deductions. I find that the total additions to the property in this schedule in 1913 were $60,824, and the property in the Hansel appraisal which was abandoned during the year 1913 amounted to $40,028. My deductions include the amount necessary to correct Hansel's mistake of including the property of the Sainte Marie Union Depot Company at its full value, when the complainant has only a one-half interest therein. Applying these additions and deductions to the Hansel total of $166,185, I find the present value of the items in this schedule to be $186,981, allocated as follows:

Freight	$ 10,961
Common	176,020

Of these values, I have later assigned a portion to Wisconsin, in the manner and for the reasons hereinafter explained under the heading "Deductions from inventory by reason of property located in Michigan, but which is also used for Wisconsin operations".

Schedule 20.—Shop Machinery and Tools.

The parties are agreed upon the value of this schedule and its allocations as fixed by Riggs in 1913.

Freight	$ 281
Common freight and passenger	98,987
Total	$99,268

The defendants, however, claim that the entire schedule should be divided between Michigan and Wisconsin. I cannot adopt this view, but I have apportioned to Wisconsin a portion of the shop machinery and tools in the Marquette shop, for the reasons hereinafter explained under the heading "Deductions from inventory by reason of property located in Michigan, but which is also used for Wisconsin operations."

Schedule 21.—Roadway and Construction Tools.

I find the present value of the items contained in this schedule to be $12,832, all allocated to common. There is no dispute between the parties on this schedule.

Schedule 22.—Water Stations.

The Hansel valuation of this schedule is considerably higher than that of Riggs on the estimated cost of reproduction but his present value figures are about $4,000 less than those of Riggs, due to his having a greater percentage of depreciation.

The testimony shows that each structure in this schedule was inspected by Riggs or his assistant, Anderson, in some instances by both, and the percentage of condition was determined for each station separately. On the other hand, Hansel figures a general percentage of condition of 70% on everything in the schedule, regardless of its age, or amount of service. It is clear that the method adopted by Mr. Riggs was a much more accurate one, and I have therefore accepted his present value figures.

I find the amount of the same to be $72,422, all assigned to common.

Schedule 23.—Fuel Stations.

On this schedule I have taken the Hansel figures, which were lower than those of Riggs in 1913, and have added to the same the value of the additions made to the property in 1913, after the Hansel appraisal, and have deducted the property inventoried by Hansel, which was abandoned in 1913. The additions amount to $11,696, and the deductions to $3,184, making a net addition of $8,512 to me made to Hansel's valuation of $60,582.

The allocations of this schedule are as follows:

Freight	$ 845
Common	68,249

Schedule 26.—Docks and Wharves.

I find the present value of the items contained in this schedule to be $475,118. The allocations and assignments are as follows:

Passenger (foot-walk to ferry at St. Ignace)	$ 715
Freight (ore docks)	392,980
Freight	56,842
Common freight and passenger (car ferry dock at St. Ignace)	24,581

In valuing the above items, I have taken the figures of Mr. Hansel as to Ore Docks Nos. 4 and 5.

It appears from the testimony, however, that although Ore Dock No. 4 was in use during the shipping season of 1912, its use was abandoned in the spring of 1913, when the new ore cars, purchased in part for storage purposes, came on the road and were put into use. Inasmuch as this dock was not in use during the whole of the fiscal

year 1913, the whole of its value cannot be included in figuring the return from the operations of that year, and I therefore, in making my valuation, include only two-thirds of the value of said dock as found by me, amounting to $67,633.00, such value representing the proper proportion, according to the time in which such dock was in use during that year.

The item of $56,842 is made up of the freight dock property at Baraga, Houghton and St. Ignace, the values of which are not in dispute, together with $20,951 which I fix as the value of docks at Marquette, as follows:

Pier, trestle approach and a crib south of Baraga Avenue	$4,061
This property is used for bank protection.	
Merchandise pier	9,558
Wharf, 18x420 feet, Hocking Bulkhead Coal Dock	882
Revetment	376
Coal dock-spear	4,422
Small dock	373
Freight warehouse	1,174
Coal dock office	105

All of the property last above valued is on or attached to the water front land in the city of Marquette, heretofore discussed by me under Schedule 1. All of it except the pier, trestle approach and crib first mentioned, and the coal dock office, are rented under the leases in that discussion referred to.

This land and dock property constitute the complainant's only connection with navigation on Lake Superior at Marquette. By far the greatest part of the coal used by the railroad is obtained by water over these docks, as well as practically all the coal for all the mines served by complainant's railroad and by the Lake Superior &

Ishpeming Railway, as well as all the coal domestically or otherwise used in the County of Marquette. On both these coal docks complainant has railroad tracks.

On the merchandise dock it has a track, and this dock affords complainant's only connection with the package freight boats which stop at Marquette.

If the lessees, or someone else, did not carry on the coal unloading business and maintain the merchandise dock, the railroad company itself would be compelled to do this business.

The approach to the ore dock by boat can only be preserved by complainant's owning very considerable land on each side of the dock.

Under these circumstances, and taking into consideration all the facts, I am clearly of the opinion that the land referred to, and these docks, are necessary for, and are in, railroad use, but that the situation is such that a concurrent use of portions of the property by industries whose occupation of the territory can be controlled by the railroad company is feasible and that the income from this rented property, being included in the railway earnings, as I have included it, lessens to the extent of the rents, the cost to the public of the use of this land, and these docks for railroad purposes.

As this rented dock property is only valued at $20,951, and that amount is all allocated to freight, the question whether it should be included in complainant's inventory is not very material.

Schedule 27.—Electric Plants.

I find the present value of the items contained in this schedule to be $8,855, all allocated to common. There is no dispute between the parties on this schedule.

Schedule 28.—Miscellaneous Structures.

On this schedule the Hansel figures are in excess of those of Riggs, and the defendants are agreed that the Riggs' figures should be taken. The allocations are as follows:

Freight	$16,357
Common freight and passenger	103,367
Total	$119,724

Schedule 29.—Engineering on Roadway and Structures.

Mr. Riggs estimated this item by applying a percentage of 4% to schedules 3 to 28 inclusive.

Mr. Hansel estimated the engineering force which would be required to survey and construct complainant's railroad in Michigan and computed the probable expenses of such force. He arrived at a cost of $275,000, to which sum $20,000 was estimated as cost of acquiring right of way.

While the percentage method is a generally accepted method for computing this cost, the method adopted by Mr. Hansel seems to me more scientific. I have, therefore, adopted it, rejecting the item of $20,000 for acquiring right of way. I have included the cost of surveying the road estimated by Mr. Hansel at $50,000 for it is a cost of construction, in no way connected with the cost or value of the right of way, as clearly appears from his own testimony.

I have fixed the value of this schedule at $255,000 and have assigned the same to passenger, freight and common, on the basis of the allocations of Schedules 3 to 28 inclusive.

Schedule 30.—Locomotives.

The valuations under this schedule are not far apart, and the Hansel valuation is the higher—the Riggs valuation in 1911, being $443,304, and the Hansel in 1912 being $466,852. But the second Riggs' valuation made in 1913 increases his former to $702,342, an increase of $259,038. This increase arose from the addition to complainant's equipment of 15 new locomotives, which were purchased in the early part of 1913, and came into service on the road in July or August of that year, and the only question in dispute is whether these new locomotives should be included in the inventory. The complainant's claim that as they were a part of the company's property at the date of the inventory and shortly thereafter were, and ever since have been, and in the future will continue to be, in actual use on complainants' railroad, they are a part of the property on which the complainants are now, and in the future will be, entitled to a return; and for this reason they insist that these new locomotives should be included in the inventory. The defendants claim that as these locomotives were not in use during any portion of the period which forms the basis of the return on which future earnings are to be estimated, they are no part of the property employed in earning that return, and therefore should not be included in the inventory.

In this dispute, each party is right in his premises, and therefore one or the other must necessarily be wrong in his conclusion.

It is perfectly true, as claimed by the complainants that these locomotives are a part of the property on which the prescribed rate will be required to pay a return; and it is equally true, as claimed by defendants that these locomotives were not a part of the property on which the complainants were entitled to a return in the year 1913 that is to be used as a basis for forecasting the future.

Which of the two opposing conclusions thus drawn from these correct premises is correct? The answer to this question depends on the purpose of the inventory. Now, the purpose of the inventory is to furnish the data of value necessary to determine what rate of return is to be expected from complainant's future operations.

This being so, it would seem at first blush that as the property in question is to be employed in the period that is to be forecast, it should, as complainants contend, be included in the inventory. But this contention fails to take into account the precise manner in which the future rate of return is to be estimated. It overlooks the fact that the future rate of return is to be estimated by first ascertaining the past rate of return and then basing the estimate of the future on the presumption that the future rate of return will be the same as it has been in the past. In making this estimate, it is the past *rate* of return (not the return itself) i. e., the relation of the particular past return to the value of the particular property employed in earning that particular return in the past period, that it is presumed will be the same in the future period to be forecast. In that future period, the value of the property employed may be different, and the return may be different from what either was in the past period, but the relation of the latter to the former, i. e., the rate of return, is presumed to be the same. From this it clearly appears that the value to be shown by the inventory is not the value of the property to be employed in the future period, but that which was employed in the past period—the value on which the rate of return to be found from past experience is to be computed.

As none of the locomotives in question were a part of the property employed in the past period, it follows that the defendants are right in their contention, and that the locomotives must be excluded from the valuation on

which the estimate of future rate of return is to be based.

This may seem on its face inequitable and it may be so in fact, as the locomotives are certain to be employed in earning the return to be realized in the future period, but if so, the inequity is unavoidable. It could not be avoided except by finding or assuming that this additional value in locomotives is required in order to earn in the future period the same return that was earned in the past period by a smaller locomotive value, and there is no evidence on which to base such a finding and no basis for making such an assumption. If any assumption were to be here indulged, it would be that, as the new locomotives were to constitute an addition to and not a substitution in the supply of locomotives already on hand, and as the return in the past period was earned by the latter supply, the presumption would be that the new locomotives were acquired in anticipation of an increase in business and that such increase of business would produce a corresponding increase in return so that the rate of return on the increased property value employed in the future period would be the same as the rate on the lesser value in the past period. I find the present value of the items in this schedule to be $428,309; and that the same is allocated as follows:

Passenger	$147,377
Freight	280,932

Schedule 31.—Passenger Train Cars.

Mr. Riggs' valuation of this schedule is less than Mr. Hansel's, and both parties accept the Riggs figure.

The only difference between the parties on this schedule is as to the method of apportionment of certain values to Wisconsin.

The method of apportionment used by both Riggs and

Hansel was to separate from the rest of the passenger train cars those cars which are used in trains running into Wisconsin, including sleeping cars, and a portion of the value of each of such cars was apportioned to Wisconsin on the relation of the passenger car miles made by each of such cars in Wisconsin to the total passenger car miles made by such car. The remaining value, as well as the value of all cars which do not run into Wisconsin at all, was assigned to Michigan.

Defendants' counsel argue for and use a different method of apportionment between states, but it seems clear that the method used by Riggs and Hansel is much more accurate, amounting nearly to an allocation, and I have adopted it.

I find the present value of the items contained in this schedule to be $255,287. Of this amount, $6,464 being the present value of the two official cars, is assigned to common freight and passenger, and the balance is allocated to passenger.

The allocations are:

Passenger	$248,823
Common	6,464
Total	$255,287

Schedule 32.—Freight Train Cars.

The only dispute between the parties on this schedule is as to the inclusion of certain ore cars which were purchased after the Hansel appraisal, and which were valued by Mr. Riggs at their actual cost, $377,200. The testimony shows that these cars were purchased and came on complainant's road at the opening of the ore season in 1913, several months before the Riggs' 1913 appraisal, and have been used ever since in complainant's freight business.

Inasmuch as these cars were not in use during the whole of the fiscal year 1913, their whole value cannot be included by me in figuring the return for that year upon the property invested. I have, therefore, included such cars at only one-third of their cost as shown by the testimony, viz., at $125,733, that representing the proportion of the time during which said cars were in use in that year.

I find the present value of all the items in this schedule to be $1,116,545, all allocated to freight.

Schedule 33.—Miscellaneous Equipment.

I find the present value of the items contained in this schedule to be $59,972, all allocated to common. There is no dispute between the parties as to this schedule.

Schedule 34.—Ferries and Steamships.

The only property contained in this schedule is an undivided one-third of the property of a company known as the Mackinac Transportation Company, in which the complainants own one-third of the capital stock. The question here is whether for the purposes of this case, this one-third interest or any part of it should be included in complainant's inventory.

The answer to this question will depend, of course, upon whether the property in question, or any part of it, is employed in the passenger service of the complainant company to which the rate applies. Any property that is so employed must be included, and all property not so employed must be excluded.

The facts with regard to the Mackinac Transportation Company and its property are as follows:

This company is a corporation operating ferry boats across the Straits of Mackinac, between St. Ignace in the Upper Peninsula, and Mackinaw City in the Lower Pen-

insula. These ferry boats afford the only means of connection between the complainant's railroad, which is all in the Upper Peninsula, and the only railroads in the Lower Peninsula which reach the Straits, viz., the Michigan Central and the Grand Rapids & Indiana Railroads. The transportation company is controlled in equal shares by these three railroads by stock ownership.

In carrying on its business the transportation company deals in part with the public but principally with the three railroads. It deals with the public only in the transportation of passengers and a small amount of local freight between St. Ignace and Mackinac. As it is not under the railroad laws of the state, its passenger rates are not limited by the statutes which regulate railway fares. For the trip across the straits, it charges 50¢ or above 7¢ per mile. Aside from this passenger and local freight business, the transportation company has no dealings with the public, but deals with the three railroads exclusively. Its dealings with them consist in the transportation of their cars, both freight and passenger, with their contents, across the straits, and in compensation for that service, the railroad companies jointly furnish the property required for the performance of the service and pay all the expenses involved in operating and maintaining the property—the separate amount contributed by each company to this joint payment of expenses being in proportion to the freight carried for each.

From these facts, it clearly appears that all of the property of the Mackinac Transportation Company is employed in the freight service of the three railroads, and that no part of it is employed in the passenger service of the complainant company to which the prescribed rate applies; and therefore, that no part of that property should be included in any valuation of property

made for the purpose of determining the question whether the prescribed rate will yield a fair return upon the value of the property employed in the service to which the rate applies.

But the defendants claim, nevertheless, that the passenger earnings of the transportation company are to all intents and purposes passenger earnings of the three railroads, and should be so treated for the purpose of this case, i. e., that the net earnings or profits should be added to the total of the net railway passenger earnings as part of the passenger revenue realizable under the rate in question. This claim more properly arises and is made in connection with the subject of complainant's income but I deem it better to dispose of the entire subject of the transportation company at once. The claim is one for which I am unable to see any good ground. We are seeking to determine whether the rate in question will yield fair compensation for the use of the property employed in the service to which the rate applies, such compensation being a fair return on the value of the property so employed; and this claim would, in such inquiry, credit the rate, not only with the earnings of the property so employed, but also with those of other property not so employed.

The defendant's answer to this apparent inconsistency is a claim that the passenger revenue of the Mackinac Transportation Company is not earned entirely by the use of the property of that company but is earned at least in part by the use of some of the passenger equipment of the complainant. The basis for this claim consists in the fact that some of the complainant's passenger coaches are carried across the straits on the same boat that carries the passengers, and the passengers may, and usually do, occupy seats in the coaches during the voyage, although a cabin for their accomodation is pro-

vided on the boat. The question, therefore, arises what effect is to be given in this case to the fact that the complainant's passenger coaches are so carried and used. While the coaches are being so carried, are they being used in the passenger service of the transportation company or in that of the complainant company or in the service of both? And in either event, how is the case affected thereby? The utmost that can be claimed by the defendants is that while being so transported the coaches are wholly in the service of the transportation company, and are being used for their own benefit entirely—but even if this were the fact, I cannot see how that fact could possibly entitle the complainant company to the net passenger earnings of the transportation company or furnish any ground for treating them in this case as passenger earnings of the complainant company. If the transportation company, or any other outside party received the beneficial use of any of the passenger property inventoried in this case, the fair value of such beneficial use should be credited to passenger income in this case; but that such use by a third party would merely for that reason, entitle the complainant to the entire net earnings of the service in which the property was used, is impossible. In such case, the fair value of the use is all that complainants would be entitled to and that value would not be determined by such net earnings but by other considerations.

The question, therefore, is what, if any, amount should be credited to the passenger income of the complainants by reason of this use of their passenger coaches?

As between the passenger service of the transportation company and that of the complainants does the former derive from this use of the coaches of the complainant a benefit for which it is equitably bound to compensate the latter?

Why, and for whose benefit are these coaches thus carried across the straits? The purpose of this use of the coaches is plain; it is to increase the convenience and comfort of passengers and thereby to increase the volume of the passenger traffic. That it does increase the passenger traffic and thereby to some extent benefits the passenger traffic of both the transportation company and the complainant, there is no doubt.

Does the fact that this increase of traffic is secured by this use of the complainant's passenger coaches entitle the complainant to a portion of the passenger earnings of the transportation company? In order to do so, it must be found that the benefit derived by the Transportation company from this use is greater in proportion to that company's contribution to the expense of this extra service than is that of the complainant to its contribution to that expense. Such a finding it is impossible to make. It is impossible to determine either the extent to which either company is benefited by this increase, or the amount which either company contributes to the expense of this additional facility. But a general comparison of the relative proportions of each can be made and from such comparison it is plain to be seen that there is no ground for holding that the transportation company receives a greater benefit in proportion to its contribution than does the complainant company. There is no reason for thinking that the benefit received by the transportation company is any greater absolutely than is that of the complainant company, or that its contribution is any smaller; but, on the contrary, there is reason for holding that its contribution is greater. The contribution of the complainant is the use of the dead passenger coaches during the time occupied in making the round trip across the straits. This use of the coaches on the one hand involves no loss to the complainant as

the coaches would otherwise merely stand idle at St. Ignace during that time, and they suffer no damage from wear in this use as they are merely standing idle on the boat; and on the other hand, there is no direct advantage to the transportation company as they could carry the passengers just as well and more cheaply without the cars than with them. But the contribution made by the transportation company does involve additional cost. It consists in furnishing the boat-room, the steam power, and the labor required for the transportation of the coaches, which is very obviously greater in cost or value than the use of the coaches contributed by complainant.

My conclusion, therefore, is that there is no ground in this case for holding that the whole or any part of the passenger earnings of the transportation company should be treated as earnings of the complainant company; that none of the property of the complainant company is employed in earning the passenger revenue of the transportation company, and that none of the property of the transportation company is employed in the service to which the rate here in question applies, and therefore that none of that property should be included in any inventory made for the purpose of testing the validity of the rate in question; that under the agreement between the transportation company and the railroads, the passenger earnings of the transportation company are all devoted to defraying the expenses of the transportation company, which the railroads are obligated to pay in compensation for the carriage of their freight across the straits; that under the terms of that agreement, the practical effect of it is that all the property of the transportation company is employed in the freight service of the three railroads, and that one-third of it should therefore be included in the inventory of complainant's property, but should be allocated entirely

to freight. The complainant claims a valuation of $216,500 on this schedule, while defendants' claim is $210,000, the difference between the parties being that the defendants claim a somewhat greater depreciation on the boat Wawatam than was estimated by Mr. Riggs. I have adopted the defendants' figures of $210,000.

To my conclusions with reference to this Mackinac Transportation Company and its property defendants' Objection No. 17 (a) is directed. They claim that the passenger earnings of this company should be included in the passenger revenues of the complainant.

This subject in general, and the passenger earnings of this transportation company in particular, I have so fully discussed that I do not care to add anything to what I have already said, except it be to reply to the claim that my treatment of this subject is inconsistent with my treatment of the Soo bridge and the Soo station. With reference to this the defendants are mistaken. They say, "We are unable to reconcile the determination of the Master to retain the Soo bridge and Soo station as part of complainant's operations, and to eliminate the passenger operations and net passenger earnings over the Mackinac Transportation Company".

The mistake which they here make is in saying, by implication, that I have eliminated the passenger operations and earnings of the Mackinac Transportation Company from *complainant's operations*, which is not the case. On the contrary, these operations are treated precisely as are those of the Soo bridge and Soo depot, and are included in complainant's operations precisely as are the latter, except that the operations of the former are entirely freight operations. The passenger earnings of the Mackinac Transportation Company are treated as

what may be called "Side earnings" of that company incidental to its freight operations, and are applied toward the payment of freight expenses just as the cash earnings of local package freight are so applied.

Schedule 35.—Engineering on Equipment.

Both Mr. Riggs and Mr. Hansel agree that to arrive at the true value of complainant's property, an allowance for engineering on equipment must be made and they agree that this element of value can best be computed as a percentage of the schedules affected, which are 30 to 35 inclusive, and that 2% is a reasonable percentage on that account. This percentage therefore, I have used in such a manner that it does not apply upon the value of equipment purchased in 1910, 1911, 1912 and 1913, because in fixing the value of the equipment purchased in those years, both engineers used the cost as shown by the books of the company, and presumptively at least, this cost included the item of engineering.

To this finding defendants' Objection No. 5 (c) (13) relates, and the claim is that

> "the larger part of the present equipment was added during operation. There is no shown cost or expense for engineering thereon. If there was any such cost, it has been charged in operating expenses, and, under *Louisiana Railroad Commission vs. Cumberland Telephone Co.* (212 U. S., 423-25), it cannot be included in the value to be supported by rates."

The objection assumes that what we are here seeking to determine is the amount that it has actually cost the complainant as an operating road to acquire its present equipment, and that no cost of engineering on equipment should be allowed, because the engineering on the present equipment was presumably done by complainant's

own staff of engineers, and that the cost of it was therefore charged and included in operating expenses.

Such assumption is erroneous. The inquiry here is not what it has actually cost the company for engineering on their present equipment, but what it would cost anybody to reproduce this equipment, and on that question all the engineers agree that on such reproduction an engineering charge on equipment of two per cent, of the cost of the equipment would be a reasonable allowance for that item.

Unless this case is being tried on a theory that is fundamentally wrong, I am unable to see how the question whether the cost of engineering on the company's present equipment was charged to operating expenses is of any consequence in this case.

In this view I am of the opinion that I was in error in not applying the percentage, as did the witnesses named, to the equipment purchased in 1910 to 1913, inclusive, and I now apply it to schedules 30 to 33, inclusive, in their entirety.

The allocations will follow those of the schedules on which this item is computed.

Schedule 36.—Terminals.

The only items contained in this schedule are two properties at Sault Ste. Marie, Michigan, viz: the property owned by the Sainte Marie Union Depot Company and the property of the New Jersey Bridge Construction Company.

There is no dispute between the parties that one-half of the property owned by this depot company devoted to railroad use, is used by the complainant, and should be included in this valuation. The situation is fully explained heretofore in my findings under the heading

"Lands in Chippewa County". The valuation under this schedule is the property other than land.

Mr. Riggs' method of arriving at the value of complainant's interest in this property was to value different items comprising the same, as shown by his inventory, to add thereto an engineering charge of 4% and then to assign one-half of the total value to the complainant.

Mr. Hansel's method was to value the separate items and then add 20% to cover what he calls overheads.

If, to the amount of the Hansel appraisal, less his land values, and his overheads, there is added the value of the increased trackage in this terminal in 1913 as compared with 1912, the Hansel valuation would be slightly greater than that of Riggs.

I have taken the Hansel valuation, reduced as above. To this I have added a 4% engineering charge, for the reason that there is no evidence other than that of Mr. Riggs showing the proper charge for engineering and the amount which this percentage gives seems to me very reasonable.

Defendants, through some oversight, assign the whole of this terminal to passenger service, but Mr. Riggs' appraisal, together with his later testimony, changing the allocation of two of the tracks shows that the allocations should be as follows:

Passenger	$22,006
Freight	6,906
Common freight and passenger	11,091
Total	$40,003

The New Jersey Bridge Construction Company is a corporation owning and operating the International Bridge between the United States and Canada at Sault

Ste. Marie. The stock is owned by the complainant jointly with the Canadian Pacific Railway Company and the Minneapolis, St. Paul and Sault Ste Marie Railway Company, the complainant's interest being one-fourth. The bridge company has some small revenue obtained from the transportation of passengers over the bridge and from charges made for allowing the stringing of telephone wires, etc., on the bridge. The complainant's proportion of these revenues is included in its revenue account. The expenses of operating the bridge are divided among the owning companies in proportion to the business received over the bridge by each company respectively. The complainant's proportion of these expenses is included in its expense accounts. The complainant does not operate any freight or passenger trains over the bridge, but the same is used as a facility for getting freight and passenger business from the Dominion of Canada. I have therefore included the interest of the complainant in this property in my valuation, and have allocated the same to common freight and passenger, but have assigned it entirely to the interstate business.

I have taken the Hansel valuation of complainant's interest, except that in place of his overhead charges of 20%, I have allowed only an engineering charge of 4%, and I find the present value of the interest of the complainant in the property to be $60,271.

Counsel for defendants arrive at a different valuation, obviously because they use, in making their computations, a printed comparison of the different appraisals, prepared for the use of court and counsel, in which there was a mistake. My figures are based on defendant's Exhibit 15, Mr. Hansel's appraisal. This bridge company owns no land.

Schedule 37.—Contingencies.

The subject of Contingencies in a rate case presents difficult questions. A contingency is defined as "a contingent event", and a contingent event is an event that is liable to occur but is not predeterminable by any rule or law—an event resulting from an agency or agencies the operation of which is uncertain.

As used in a railroad rate case, the word "contingency" means the uncertain and unforseeable events that are liabel to occur in connection with the construction of a railroad property and which, if they do occur, will involve expenditures or costs in addition to the forseeable, certain costs which can be definitely estimated. It includes, also, when used in a rate case, all liability of error either in measurements, estimates or otherwise.

In dealing with the subject of contingencies, as it arises in making estimates of probable costs, it is universally recognized as a fact, demonstrated by experience that such unforseeable events are always liable to happen and that the amount of costs, as shown by estimates of the forseeable costs only, is therefore always liable to be increased by such unforseeable happenings. In consequence of this, it has become the general practice of engineers in making estimates of the cost of work to be undertaken, to first make their estimates of the forseeable costs, and then make an allowance for the unforseeable costs, and add it to the former. That these contingent costs should, in ordinary prudence, always be taken into consideration and that an estimate of the cost of a proposed work which includes a proper allowance for such costs will be more nearly correct than it would be without such allowance, there is no room for question, either in a rate case or elsewhere. The sole question in any given case is what shall be the amount of that allowance; and that question is one of extraordinary difficulty.

As the amount which it is required to fix is dependent upon future events that are not predeterminable by any rule or law, it is itself incapable of definite predetermination or of being estimated by any rule or law except by approximation based on the law of average. The only way in which it can be estimated is by taking the results of experience and applying to them the law of average—that is to say, by taking the average proportion which the contingent costs actually incurred in past operations bear to the entire cost of such operations and basing the estimate of future contingent costs on the assumption that that average will be maintained. This I have done in what follows:

Passing now to the question as to what, if any, amount should be allowed for contingencies in this case—that question must, of course, be determined from the evidence, i. e., it is to be determined on the basis of experience as that experience is shown by the evidence.

That evidence consists of the testimony of six witnesses, who testified as experts in engineering—five of whom testified on behalf of complainant, and one on behalf of defendants. All of those witnesses agreed in recognizing the liability to additional costs arising from contingencies, and also the need of making an allowance for such costs—the only difference between them being as to the amount of the allowance and the manner in which it should be arrived at.

The evidence on the subject is of two kinds, specific and general—specific as to the amount that has been found proper to be allowed in other cases, and generally—both the specific and the general testimony being based upon experience and both being expressed in a percentage on all or a great part of the other costs. The specific testimony on behalf of complainants is as follows:

Mr. Riggs, the complainant's chief expert allows for

contingencies a total of $918,429 which would equal an average percentage of 8.8% on schedules 3 to 28 inclusive. It was not, however, arrived at by such application of that percentage but by applying different percentages to different schedules.

Mr. Young, chief engineer of the Lake Superior and Ishpeming Railway considers Mr. Riggs' allowance too low (Record 925-27), and thinks that the allowance for contingencies in the reproduction cost of this property should not go below 10% of all the construction costs. (Record pp. 924 and 1899.)

Mr. Loweth, chief engineer of the Chicago, Milwaukee and St. Paul Ry. also thinks that the Riggs' estimate is too low; also that contingencies cannot be placed on specific items; and that in making an estimate of the fair reproduction cost of the South Shore road, it would be conservative to put a contingent item of 10% on the entire cost, except overheads. (Record pp. 2780-81.)

Both Mr. Young and Mr. Loweth testified from particular experience in the construction of railroads in the northern peninsula of Michigan, as well as from their general experience as engineers.

Professor M. E. Cooley of the Michigan University also fixes 10% as the percentage that he would apply for contingencies to a property like the South Shore.

This constitutes the complainant's specific testimony as to the proper amount to be allowed for contingencies in this particular case.

The general testimony on behalf of complainant is that of the witnesses Riggs, Young, Loweth, and Cooley, above named, all of whom testified in effect that from their experience as engineers, they had found that the contingency costs in railroad construction of this character would run from 10% up of the amount of the other costs, meaning construction costs; and also the testimony of Mr. Hoag-

land, the chief engineer of the Great Northern Railway, who testified that according to his experience the contingency costs would run from 10 to 15% and that in appraising the reproduction cost of a railroad, the contingency item has usually been taken at about 10%. This witness testified as follows:

> "I have made a special study to determine how estimated cost before the performance of the work compares with actual costs. In this work I went through the books of the Great Northern showing additions and improvements to the property from 1903 to 1907. All our estimates for additions and improvements are made up on what we call an authority for expenditure blanks so as to secure the approval of the executive officers before the money becomes available. I found that during these five years, the total estimated costs of additions and improvements was $25,223,738.65 and the actual cost of the work was $29,096,067.47—the increase over the estimate being 15.35 per cent. Those estimates were made with the intention of showing as nearly as we could, what the work would cost, and each one was itemized in detail and covered all classes of work and in locations with which the company and its engineering officers were as familiar as they could become by construction of the existing road." (Record 3125-6.)

As explaining and illustrating the nature and need of a contingency allowance, the following is taken from the testimony of Mr. Loweth, who had had a large experience in construction work as chief engineer of the C. M. & St. P. Railway Company:

> "The item of contingencies in the cost of reproduction of a given property should include those items

of cost, whatever their character, that could not be seen in making an inventory of the property, or which might be overlooked or by error or oversight, omitted from such inventory and by the possible error in the unit cost that might be taken in making the valuation. The contingencies in making an estimate of the cost of a property to be built would cover those things which, due to the haste in which the matter was investigated, had been overlooked or which from the nature of the case could not be foreseen and provided for. I think that there is very little, if any, difference in the allowance for contingencies in the case of making an estimate of reproduction of an existing property and in making an estimate of the cost of property that was proposed to be built, for the reason that as we go over a completed property there are always some elements of cost that are not apparent. It is impossible to carry out any large piece of construction without accidents, accidents of such a nature that they involve a loss of life and property. Those losses enter in as one of the contingent items. In going over a completed property it is impossible to tell whether anything of that kind did happen or not, but from our experience in reconstruction we know that they certainly do happen."

Mr. Loweth then mentioned certain things that happened in his own experience in the construction of the line built by his company to the Pacific Coast; as, for instance, the cost of making trails and roads in order to make surveys and to get the contractors' men and materials in; extra expense for freight, due to having to route construction materials over other roads, caused by delays in grading so that it was impossible for him to take such materials over his own road; building temporary bridges to enable the grading contractors to cross streams with

the track; building a tunnel at great expense, and then finding that the material was so yielding that it had to be made into an open cut; at least one severe flood which took out all the temporary bridges and a part of the bridges in course of construction for a distance of seventy-five miles; and a large number of fatal accidents to men.

After giving this experience, Mr. Loweth further testified as follows:

> "In my judgment it would be conservative to put the contingent item of ten per cent on the entire cost (of the physical items), in making an estimate of the fair reproduction cost of the D. S. S. & A. road in the Northern Peninsula of Michigan. While the contingent amount of some items might not be as large as ten per cent, on others it might very readily be much in excess. That would not include ten per cent on the cost of organization and legal expenses and interest and engineering and the like, but upon the physical items. In my opinion the ten per cent would be an average of all items and not the amount of contingencies applicable to each item. I think it is universal in making an estimate for new work to allow for contingencies, and it has been our practice to add ten per cent and to add ten per cent after we had taken unit prices that in a measure made some allowance for the same."
>
> "I am as confident, as I could be of anything, that has not occurred, that in the reconstruction of the South Shore road, we would have casualties, accidents, which would involve injury to persons and property, which would be contingent items such as those I have mentioned, for work of that character which would extend through three or more seasons. It is also quite sure that there would be contingent

items in the way of floods. There would be contingent items in respect to classification. I doubt not that there is considerable material, the exact character of which would not be evident on a superficial inspection of the property. I do not see how that extent of railroad could be built without involving diversions in the highways, in farm crossings, and in diversions of streams. Those contingent items would surely occur. There would be contingent items in connection with the construction of the road over or under or across other railroads, electric and steam; due to the crossing of telephone and telegraph wires, which would have to be changed; due to the construction in the cities in which paving would be disturbed, water works pipe, or sewers or things of that kind. There would be other contingent items that would be more or less of the general character of those I mentioned. In my judgment there is a reasonable probability that these or a certain proportion of them will occur in every railroad that is constructed. The percentage would vary according to the weather conditions, season of the year and character of the country through which the road was built. The contingent items would be smaller if all conditions were favorable, such as casualties, floods and things of that character. The item of farm crossings, highway crossings, of pavements in cities assume the passing through of a settled territory. If the territory is sparsely settled, the possibility of those items and the amount and percentage of them would be smaller, and for exactly the same reason, other contingent items would be more. There is, as I remember the country, a large proportion of swamp land and soft land, the surface of which is soft and yielding, and there would be a more than

usual contingent item in the increase of earthwork on that account. The country traversed by the South Shore Railroad is not as accessible for the getting of supplies and men as a similar length of railroad would be in many other sections of the country, and the difficulties of getting labor and holding labor and getting supplies in, would be enhanced over and above what it would be in most any other section of the country, anywhere within a radius of 500 miles, or a thousand miles."

This general testimony on the subject of contingencies introduced by complainants is uncontradicted; and not only so but it is confirmed so far as it relates to new work by the defendants' witness Mr. Hansel, who testified as follows:

"Q. Your contingency in round figures is $479,000; your total is 15 and a half millions—less than four pe rcent considerably. Did you ever know a railroad engineer in estimating the cost of a road which was actually to be built, as distinguished from a reproduction, that did not estimate it as high as ten per cent?

A. No, I should estimate higher.

Q. Higher than ten per cent?

A. I should estimate higher than I would ordinarily; sometimes go as high as 15 per cent.

Q. That is the practice, isn't it, to go from 10 up?

A. I think so. Of course they were not in a position to analyze as closely as I was in this case. (Record 4942.)

Q. Let me get this then. There is a customary practice, is there not, in engineers' offices as to contingencies for work which is to be done?

A. Yes.

Q. And the minimum is 10 per cent on railroad work—the minimum of the total, ten per cent of the total?

A. Yes, I should say so.

Q. Covering lands and everything else?

A. Yes, I should say so." (Record 4947.)

On behalf of the defendants, their chief expert witness, Mr. Hansel, makes an allowance for contingencies amounting to $479,735, being about one-half of the amount allowed by Mr. Riggs. This amount is an average of 5.09 per cent of the Hansel valuation of the schedules which give the Riggs average of 8.8. It was not, however, arrived at by such a percentage application, but by an allowance of 10% on certain schedules, viz: Schedules 3, 16, 20, 29 and 38 to 42 inclusive.

This allowance with Mr. Hansel's explanation of it, constitutes the defendant's testimony on the subject of contingencies. And it is seen that it is all specific, i. e., specifically directed to the question of the amount to be allowed in this particular case; and that on that question, it is only to the effect that the amount named is to be spread on the schedules named in the percentages mentioned, because the witness considers his valuations of those schedules too low to the extent of the respective amounts to be applied to them for contingencies. No testimony is offered by defendants to show that this allowance is based on or is in harmony with, general experience. It stands alone and as evidence it has no direct bearing on the question as to the proper amount to be allowed in this case. Its primary and direct bearing is solely on the question as to the amount that should be added on account of contingencies to the Hansel valuation of the other items and as that amount depends entirely on the correctness of the Hansel valuation, it would

bear on the main question only in case that valuation were adopted as the correct valuation.

What is here said of the probative effect of this Hansel testimony is equally true of the Riggs' testimony insofar as his testimony relates specifically to the amount that should be added to his valuation on account of contingencies. The amount of the allowance for contingencies must be determined not on the testimony of either Riggs or Hansel, as to the amount to be added to his valuation, but on the basis of experience as shown by all the testimony and the law of average. This basis, both Mr. Hansel and Mr. Riggs must be presumed to have employed in determining the amount that he states should be added to his valuation on account of contingencies, and to have supplemented it by a due consideration of the care and accuracy with which his valuation was made up. It is on the same basis of experience as that experience is shown by the evidence, that the court is to determine the amount of the allowance, giving such weight as seems proper to the two facts that Riggs thinks that $918,429 should be added to his other values and that Hansel thinks that $479,735 should be added to his other values.

The question to be determined by the court is not what amount should be added for contingencies to the Riggs valuation or to the Hansel valuation, but what amount should be included in its own valuation, in view of the results of experience as shown by the testimony, including that of Riggs and Hansel.

Upon this question, the evidence is practically unanimous that the contingent costs in producing and reproducing the South Shore property would amount to 10% of all the other costs, meaning construction costs, and that 10% would be a proper allowance in estimating the reproduction of the South Shore property. This is testified to by all of the five engineers called by the com-

plainant and there is no testimony to the contrary. True, Mr. Hansel says, in effect, that the other costs of reproducing this property can be so accurately estimated that a percentage of 5.09 on the other costs would be a sufficient addition to be made for contingencies, but this is only because he thinks he, himself, can make such accurate estimate and has done so.

From the foregoing evidence, I find that in the reproduction of complainant's property, there are costs which are certain to be incurred for certain purposes which can be foreseen, and the amount of which can be estimated with reasonable certainty; that according to universal experience, the total cost of reproducing the property will exceed the total of the costs thus foreseen and estimated by reason of additional costs arising from mistakes and unforeseeable happenings, that these additional costs are by their very nature such that their amount cannot be foreseen or estimated in the manner and with the degree of certainty that the foreseeable costs can be estimated, but that they can be estimated on the basis of general experience and the law of average; that according to such experience these additional unforeseeable costs usually amount to, on the average, from ten to fifteen per cent of the total of the estimated costs of Schedules 3 to 28 inclusive, that, according to the weight of evidence in this case, the amount of such unforeseeable costs to be estimated on the reproduction of complainant's property would be ten per cent of the total of the estimated costs of Schedules 3 to 28 inclusive, amounting to the sum of $782,306; that although an allowance of this amount would be supported by the weight of evidence I do not make such allowance, but in view of the uncertainty pertaining to the subject, and on the principle of resolving all doubt in favor of the defendant, I have decided to allow for contingencies the sum of $400,000, the same being

little more than one-half of the amount last named and more than $79,000 less than the amount allowed for contingencies by the defendants' expert, Mr. Hansel.

I should not feel justified in making this allowance less than the figures fixed by Mr. Hansel were it not for the fact that it is claimed by defendants that certain items of property were valued by both Riggs and Hansel at the cost thereof as shown by the complainant's books of account, and insofar as any such property was bought, acquired, or created so recently that price or value may be deemed to be the same as when valued by the engineers, I think no contingency should be applied. I consider my deduction of more than $79,000 ample to cover such items of property.

This allowance is made against objections from both parties, from the complainant on the ground that it is much smaller than it should be according to the weight of evidence, and from the defendants on the ground that no allowance at all can be made for contingencies in a rate case, and possibly upon the ground also that it is too large, but probably not on the latter, as my allowance is less than the amount which is shown to be proper by the only testimony introduced by the defendants on the subject.

Having thus determined the total amount to be allowed for contingencies in this case, it is unnecessary to consider the schedules separately with reference to it and undertake the task of determinng what part of the total amount may be rgarded as applicable or attributable to each. That task is very difficult, and is considered by some engineers impossible of accomplishment. I think it is impossible, at least to some extent, and I find that even if possible in some cases, it is wholly impossible in this case, for the reason that there is no testimony on which it can be done. The only testimony that applies a conting-

In the foregoing discussion I have arrived at the amount which the weight of evidence shows should be allowed for contingencies in estimating the value of complainant's property. It now remains to consider whether the amount thus shown by the evidence is shown with sufficient certainty to entitle it to be accepted in a rate case.

The defendants claim that it is not, and in the nature of things cannot be so shown; that in a case where confiscation is claimed, as the question is merely as to the value of existing property, there is no room for uncertainty either of inventory or of construction and therefore no room for contingencies; also that if there are contingencies, the errors involved are as likely to be above as below the true value.

This objection, although on its face plausible, involves I think a misconception of the exact nature of the claim for contingencies—a misconception growing out of the fact that the claim for contingencies as mentioned in the inventory constitutes a distinct schedule in consequence of which the objection assumes the claim for contingencies to be a separate and independent item of the inventory to be allowed or disallowed in whole or in part, which assumption is erroneous.

The claim is not a separate item of credit in the inventory but a part of the estimated cost of the entire property, and the form in which it appears, i. e., as a contingency item is a part of the method employed in estimating the entire cost. As it is set forth in the respective inventories of Riggs and Hansel, the contingency item is merely an explanation by the witness who made the inventory and appraisal, of the method by which he reached his total of quantities and values. The witness says in effect that in making his inventory he made accurate measurements and mathematical calculations as far as

possible, but that it was not possible by these measurements and calculations to estimate with accuracy the reproduction cost of the property and its present value, and that for that reason his inventory and appraisal is incomplete and does not fully and correctly set forth the property and its value; that in order that it may do so, it is necessary to add to his other estimates a sufficient amount to cover these uncertainties which cannot be definitely known beforehand, but must be estimated, and that his estimate of the amount to be so added, based on his experience as an engineer, and that of engineers generally, is the amount which he mentions.

It is seen therefore, that his statement relates entirely to the correctness of the inventory and estimates of cost made by the witness offering the inventory; that it is merely a part of his testimony and is to be treated accordingly; that to reject it and take his other estimates as adequately expressing the entire reproduction cost would involve a finding that the witness' other estimates are adequate and correct in the face of his own testimony that they are not so. Such a finding would certainly be very curious, and one for which there is no support in the testimony. In fact, it would be on its face contrary to the testimony and therefore impossible.

The contingency allowance is so essential a part of the witness' testimony as a whole that it is impossible to separate it from the rest and reject it, and at the same time take the other estimates as adequately expressing the value of the whole property.

Those remarks apply equally to the testimony of Mr. Hansel and Mr. Riggs, each of whom makes a contingency allowance; and as theirs are the only inventories and appraisals in the case, it is hard to see how it is possible to make a valuation of the property on the evidence without making an allowance for contingencies.

It is true as claimed by defendants, that the estimates of quantities and values in an inventory may be too large as well as too small but the probabilities in that regard are not necessarily equal, and whether they are greater on the one side or the other, or wholly on one side, will depend on how the estimates are arrived at, that is to say, will depend on how the appraiser deals with the inevitable uncertainties of his task. In dealing with these uncertainties he may take either of three courses, viz: (1) He may undertake to allow for all uncertainties in making his estimate of each item; in which case it would presumably be true that his estimates would be as likely to be too large as too small, or (2) he may instead plan to make each estimate large enough to cover all chance of its being too small, in which case all the uncertainties would be thrown on the side of its being too large, and would require that the estimates be reduced by a percentage deduction, or (3) he may make each estimate small enough to cover all chance of its being too large, thus throwing all the uncertainties upon the other side, and requiring that the estimates be increased by a percentage addition.

Of these three courses, both of the engineers in this case have chosen and followed the third, and this, it clearly appears from the evidence, is the invariable practice of engineers in general.

It will thus be seen that the objection to a contingency allowance in this case is in reality an objection to the method of valuation and of proving value, which is recognized as proper and adopted by both the parties in this cause. The substance of the objection is that proof of value, which involves the inclusion of an allowance for contingencies is not sufficiently certain to meet the requirements of a rate case. It is not claimed that such proof of value is not sufficient to meet the requirements

of an ordinary civil case, but that it does not prove value with sufficient certainty to overcome the presumption of constitutionality in a rate case, i. e., the presumption on this particular point that the legislative judgment of value was correct. The precise question therefore raised by the objection to a contingency allowance is whether value proved in this way is proved with sufficient certainty to entitle it to be accepted as the true value, although the legislative judgment of value presumed to have been found may have fixed a different value.

The answer to this question is found in the preceding discussion of the burden of proof and its requirments in this case. It is there seen that the presumption of the constitutionality of a statute is a rule or principle of inter-departmental comity, observed by the courts in testing the constitutionality of a statute, the rule being that as it is the duty of the legislators to carefully consider the constitutionality of every proposed statute before enacting it, and to refrain from enacting it so long as there is any reasonable doubt in their minds of its constitutionality, the courts will presume that the legislators performed that duty and found beyond a reasonable doubt that the statute was constitutional; and that the courts will not overrule the legislative judgment in that regard until satisfied in like manner beyond a reasonable doubt that the legislative judgment was erroneous. In other words, the principle is that the courts will accord to the legislative judgment the same degree of respect that it was the duty of the legislature to accord to the constitutional limitations by which their powers are circumscribed.

Applying this principle to the case before us, in which the correctness of the legislative judgment is in question and where the question is whether a certain amount should be allowed which amount it is in the nature of

things impossible to determine with certainty; can the court find the legislative judgment erroneous or is the court by this rule of inter-departmental comity required to refrain from forming and giving effect to its own judgment merely because of the uncertainty in the nature of the subject on which the judgment is formed? Must the court, because of such uncertainty defer to the legislative judgment and render it immune from judicial criticism although that judgment is subject to precisely the same uncertainty as is the judicial judgment?

The answer must be that the legislative judgment cannot thus become immune; that the legislative judgment can be no more certain than the nature of the subject will permit, and therefore can be no more certain than the judicial judgment on the same subject, and it therefore is subject to reversal by the latter precisely as are legislative judgments where no such uncertainty exists.

From all the evidence in the case, I am convinced beyond a reasonable doubt, not that the $400,000 which I have allowed for contingencies is the exact amount of the additional costs that would be incurred in the reproduction of complainant's railroad resulting from contingencies, but that that amount is a fair and conservative estimate of the minimum of such additional costs, arising from contingencies not taken into account in the other estimates.

Schedule 38.—Legal Expenses during Construction.

It appears by undisputed testimony in this case that to arrive at the true reconstruction cost and the true present worth there must be an allowance made for legal expenses during construction. And it appears from a clear preponderance of evidence that this element of cost can best be computed upon a percentage of Schedules 3 to 37 and that one-half of one per cent is a reasonable per-

centage to be applied. I have applied this percentage to Schedules 3 to 36 inclusive only, and in such a manner that it will not apply either to the equipment acquired in 1910, 1911, 1912 or 1913, or to any other additions or betterments made to complainant's property during 1912 or 1913, because to a certain extent in valuing this added property the engineers used the cost thereof as shown by the records of complainant, and it is perhaps to be assumed that any legal expense was included in such cost.

I find the value of this item to be:

Passenger	$ 2,529
Freight	16,107
Common	32,804
Total	$51,440

To the foregoing finding under Schedule 38, the defendants make objection (Objection No. 5 (c) (15) to the effect that legal expenses during construction should be estimated on the basis of actual legal expenses during operation after construction, and that, thus estimated, they would be much smaller than my allowance for that item.

Upon the question whether they should or should not be so estimated, there is no direct testimony; nor is there any testimony as to what the amount would be when so estimated. All the testimony on the subject estimates the amount on the basis of a percentage of costs, which of course bears no relation to legal expenses during operation, and necessarily negatives the idea that they should be estimated on the basis of the latter.

And it seems to me entirely clear that the witnesses are right in making their estimates on that basis, rather

than on any amount of legal costs, actual or estimated, during the period of operation.

I can see no relation or analogy between the legal expenses during and in connection with the construction of a property, and those during a similar period of operation of the same property which would make one the measure of the other.

This view is strongly confirmed by the fact appearing in the testimony that in all the state appraisals mentioned, being six in number, among which was the State of Michigan, the appraisal for the state estimated this item on the basis of a percentage of costs, and not only so, but, so far as I can judge, used the same or a higher percentage than that testified to here and on the same schedules.

It is true, as defendants claim, that Mr. Riggs expressed the opinion that the legal expenses of a railroad during operation would probably be greater than the legal expenses during construction, but when his attention was challenged to the actual legal expenses of complainant from 1910 to 1913, inclusive, he repudiated the idea that such expenses could possibly be used as a basis for determining legal expenses during construction. (R. p. 1586.)

The allowance made by me is, I think, fully supported by the weight of evidence, but in view of the inherent uncertainty of the subject, I have decided to adopt the estimate of defendants' expert, Mr. Hansel, of $50,000.

Inasmuch as I no longer use a percentage in the calculation of legal expenses, I make no deductions on account of recent equipment acquired 1910 to 1913, inclusive, or on account of additions and betterments made during those years, especially as I am inclined to think I was in error in the theory on which I originally made

those deductions, as I have explained under Schedule 35, Engineering on Equipment.

This amount I have apportioned between passenger, freight and common on the basis of the allocations of Schedules 3 to 36, inclusive, which results as follows:

Passenger	$ 2,360
Freight	15,740
Common	31,900

Schedule 39.—Organization, Administration and General Expenses during Construction.

All the witnesses who testified on the subject agree that some allowance on account of organization, administration and general expenses during construction is necessary to be made to arrive at the reproduction cost and therefore the true present value of complainant's property.

Mr. Hansel, employed by the defendant, fixes the amount of this allowance at $100,000.00, giving no other reason, so far as I can find from the testimony, than that that appeared to him to be a sufficient amount.

Mr. Riggs, for the complainant, allowed on this account 2% on the value of Schedules 3 to 37 inclusive. Other testimony in the case confirms this allowance as conservative. On these schedules as I have found their value, this percentage would make the amount considerably above $200,000.

The allowance made by Mr. Hansel is less than 1% of my valuation. I think it too small, and I fix $125,000 on account of this schedule, which amount, under the testimony, is extremely conservative. It is less than 1¼% of the schedules affected, and will makes the amounts for this item and legal expenses together less than 1¾%, which percentage the weight of the testimony and all the

authorities I have been able to find indicate is a conservative allowance.

This amount I have apportioned to passenger, freight and common, on the basis of the allocations of Schedules 3 to 36, inclusive.

Schedule 40.—Interest and Taxes during Construction.

All the witnesses in this case agree that one of the items of construction of any railroad property is the interest on money which is expended during the period of construction, while no return is being received from the operation of the property, and that there must be added to the appraisal an amount sufficient to take care of this construction expense. Without this testimony it seems to me too clear for argument that interest during construction is as much a part of the cost and value of any property as the material from which it is constructed.

In *State Journal Ptg. Co. v. Madison Gas & Electric Co.*, 4 Wis. R. R. Com. Repts., 501 (at 542), I find this statement:

> "The element of cost by reason of interest during construction is one which cannot be escaped. It is present to some extent, no matter what the method of financing the construction may be. From the time an investment for construction is made until the completion of the entire plant enables that investment to become active as an integral part of a working whole, there is the element of interest, for that investment is necessarily involved and is necessarily idle until the completion of the plant to a working point. The fact of interest, like the fact of depreciation, is present, no matter what method be employed for the financing of it. This is as true when the money is furnished by the owners as when it is bor-

rowed by them. The theory upon which such interest rests is sound, and remains so even in isolated cases where the investors may decide to charge no interest and choose to donate the same to the consumers in the way of lower charges for the services rendered. Even if the company let a contract for the complete construction of a plant, to be paid for in no part until wholly completed to the operating point, interest cost would come in as a part of the contract price, even though not expressly set forth. In that case the contractor would have to ask a higher price to cover the interest cost. Some additional compensation is needed for the investment made by him during the progress of the work and which is necessarily idle until the completition of the plant. Should the company itself construct the plant and be able to arrange to do the entire work on credit—gathering the material, machines and equipment, labor and everything additional needed on credit, to be paid for at the completion of the plant at the point of operation—the interest cost would enter nevertheless in some form in the entire cost of construction."

Mr. Riggs, the engineer employed by the complainant, was of the opinion that interest during construction should be allowed on every construction item, including land. He estimated the time of construction as three years, and allowed interest on the total of the Schedules 1 to 38 inclusive, for one-half that period of time. This method of computation was approved by several of the other engineers who testified in the case, and it is the method most commonly used.

Mr. Hansel, the expert engineer employed by defendants, undertook to estimate the time during which the money required for each construction account would be

invested before earnings would commence, and he made a schedule based on such estimate.

He assumed that the period of construction would be two and one-half years. He used 6% as his interest rate, and I may here say that all the witnesses testifying on the subject agreed that the money for the construction could not be obtained at a less rate.

His schedule of interest allowances was as follows:

12% on Schedules 1 and 15.
7½% on Schedules 3, 5 and 29.
9% on Schedule 6.
6% on Schedules 7, 8, 9, 16, 35, 37, 38 and 39.
4% on Schedules 17, 19, 22, 23 and 28.
3% on Schedules 10, 11, 12, 13, 14, 20, 21, 26 and 27.

The great weight of testimony is against Mr. Hansel's proposition that the road could economically be constructed and put in operation in two and one-half years. I am convinced from the testimony that it would take more than three years, and I find that three years is the minimum time to be assumed. All the witnesses said more than three years. Insofar then, as Mr. Hansel's schedule of interest charges is based on his assumed time of construction (two and one-half years) it is in error.

We need not consider his allowance on Schedule 1, Right of Way and Station Grounds, because the decision in the Minnesota rate cases settled, beyond controversy, that there can be no interest allowed on such property if valued as of the present time.

Mr. Hansel discusses his interest allowances very fully in his appraisal (defendants' Exhibit 15, page 239, et seq.) and from his statements it is at once obvious that his allowance on Schedules 3 (Grading), 5 (Bridges, Trestles and Culverts), and 29 (Engineering on Roadway and Structures), is based on the assumption that

two and one-half years only would be required for construction.

I think that the allowance on Schedule 6, Ties, is also based on the same assumption, but I cannot be sure of it, nor can I be sure that the rate per cent allowed on any of the other schedules is necessarily dependent upon the time assumed for the complete construction of the road.

In this situation, my inclination would be to apply the complainant's method, using a 6% rate of interest, but as that method assumes an interest charge on lands during practically the entire period of construction, I am not able to determine to my satisfaction for what time the interest charge, under complainant's theory, would apply to the remaining schedules. In this dilemma, I am forced to adopt Mr. Hansel's method, and I use his percentages on the same schedules to which he applied them respectively, except that on Schedules 3, 5 and 29 I use 9% and on Schedule 37 (Contingencies) I compute no interest.

Even on the basis of Mr. Hansel's estimate of two and one-half years for construction, his allowance of 7½% on Schedules 3 and 5 is not sufficient, for the reason that he is incorrect in assuming that the interest charge on these two schedules would be evenly distributed throughout the entire period of two and one-half years. All the testimony in the case shows that the investment in these two schedules would be the first heavy investment after the purchase of the right of way, and that this work would be completed before other work on the roadway could be commenced. He allows one year for track laying and surfacing, and for ballasting, and these operations cannot go on before the grading is finished and the bridges in. If it is assumed that the one year he allows for these operations is an average of only six months, nevertheless, the total investment in Schedules 3 and 5

would be incurred at least six months before the final completion of the road, or two years after starting the work, and a 9% interest charge would necessarily be incurred before the road was completed.

Both the engineer for the defendants and for the complainant figured their interest during construction upon the reproduction value of the property, upon the theory that there could be no depreciation. The argument to support this contention is interesting and perhaps plausible, but I am not convinced that it is sound, and therefore I allow interest only upon the present value which I find.

In connection with this schedule, the claim was made by the defendants that there could and should be net earnings from the operation of completed portions of the line during the period of construction which should be taken into account as a partial offset against these interest charges. In support of this contention they produced the reports of the Detroit, Mackinac & Marquette Railroad to the Commissioner of Railroads of Michigan for the calendar years 1880 and 1881. These reports show net earnings during the construction of 151 miles, which were probably constructed in two years, of $7,711, or $51 per mile for the entire mileage under construction.

This is the only evidence offered by defendants in support of this claim. Does it prove that the net cost of reproducing this road could presumably be reduced $51 per mile through earnings derived from operations during construction? It shows that the earnings from operation during the construction of this part of complainant's road exceeded operating expenses by $51 per mile, and it therefore shows presumably that on a reproduction of the property there could be realized a like amount of net earnings, but it does not show that those net earnings would make the net cost of reproduction less by that

amount. In order to bring about that result, the operation from which these earnings are realized must be so carried on as not to increase the costs of construction over what they would have been had there been no operating during construction.

I find from the weight of evidence that on a reproduction of complainant's property in accordance with the plans, specifications and estimates proposed by either of the engineers in this case, such operations during construction could not be carried on without increasing the cost of construction, and that such increase would be great enough to overcome the amount of net earnings that could be realized from such operations.

To this finding on the subject of interest during construction defendants object (Objection No. 5 (c) (16) upon three grounds, viz: (1) that it is greater than any amount shown to have been expended on account thereof out of capital; (2) that it is greater than any amount which would be expended in case of reproduction; and (3) that it is computed on items valued at actual cost.

The first ground involved an erroneous assumption. It assumes that there is evidence in the case showing the amount actually paid for interest during construction and that the amount so shown is less than that allowed by me; whereas there is no evidence whatever of the amount actually paid for interest during construction. This ground is therefore without foundation. It may be added that proof of the amount actually paid for interest during construction although it might be relevant evidence tending to show the amount that would be required in a reproduction of the property, would not be conclusive or necessary evidence for that purpose. As to the second ground, the question whether the amount allowed by me

is greater than any amount which would be expended in case of reproduction is fully covered in my former dissussion, as what I there undertook to determine and did determine was the amount which would be required to be expended on a reproduction of the property. I, therefore, can only reconsider the amount of the allowance made and see to what extent, if at all, it is too great. This I have done and have found no reason for changing the amount of the allowance.

With reference to the third ground that "interest during construction is computed upon items shown in Exhibit 1 (p. 2) to be included in the inventory at actual cost," I am unable to see its bearing—unable to see how the fact that any part of the property is appraised at actual cost is any reason why interest during construction should not be allowed on that value, unless it appears that an allowance for interest during construction was included in the assumed cost, which, in the nature of things, could not be the case, because interest during construction is an element of cost that accrues after the purchase of the item valued in consequence of unavoidable delay in putting the item to profitable use after its purchase.

Mr. Hansel made an allowance for taxes during construction of $63,709, of which amount $13,709 was on land values, on which, under the decision in the Minnesota rate cases, no such allowance can properly be made. Mr. Riggs included nothing for taxes during construction. It seems to me that a reasonable allowance for taxes during construction is an element of the cost and value of the property which cannot be ignored. Mr. Hansel's allowance is, in my opinion, under the evidence in the case, altogether too small. The evidence shows that the taxes paid each year by the complainant on its Michigan prop-

erty, including lands, exceeds $200,000. An allowance, therefore, of $100,000 on account of taxes during construction on property other than lands seems to me most conservative.

To my finding on the subject of taxes during construction defendants object (Objection No. 5 (c) (17) that no allowance for taxes during construction can be made, basing their objection on three grounds:

1st. That there is no proof that taxes would be paid;

2nd. That there is no proof of what was actually paid during the period of construction of complainant's property;

3rd. That there is no proof of the amount that would be paid in case of reconstruction.

As to the first ground: This assumes that no allowance can be made for such taxes unless the fact that the company would be required to pay taxes on their property in the period of construction, is proven by affirmative testimony, just as any fact requiring to be proved is proven in the case. The question thus raised is one of presumption, i. e., whether the presumption is that the company's property would be taxed during that period or whether the presumption is that it would not. The objection assumes the latter presumption, but I can see no ground for such assumption. The law requires that all such property be assessed for taxes by the proper officers, who, in this instance, would be the State Board of Assessors, and requires the proper officers to enforce payment of the taxes so assessed. So that the question of presumption is simply whether the law presumes that these officers will perform their duty which, to my mind, is no question at all. It is impossible that any court would hold that the presumption is that an officer of the law will not perform his duty, and that therefore the fact that he will do so must be proven by affirmative evidence.

As to the second ground:

It is true that there is no proof of what was actually paid by the complainant for taxes during the construction of their road, but the absence of such proof furnishes no ground for refusing to allow anything for taxes during the period of a supposed reconstruction. If the proof showed that such taxes were paid, and in what amount, that amount could not be taken as the amount to be allowed here, as there would be no presumption that it would be the same, although it might properly be considered in estimating the amount to be allowed here.

As to the third ground:

This evidently assumes that no allowance for such taxes can be made until their amount is shown by direct testimony, but it hardly seems possible that the defendants so intend. No such direct testimony is possible. The amount of what such taxes would be is a matter of estimate, based upon data; and all that could be proven by direct testimony is the facts constituting such data, viz., first the amount in value of the property that would be subject to taxation during the period of construction, and second, the rate of taxation. These facts are shown by, or are deducible from the evidence, and the item cannot therefore be disallowed in its entirety for want of proof. There remains, therefore, only the question of amount.

That question I have reconsidered for the purpose of determining whether my allowance of $100,000 was too large.

Upon the precise question of amount there is no direct testimony except that of Mr. Hansel. He fixes an amount, but in doing so does not undertake to make an estimate arrived at by any calculation based upon data. He recognizes that the estimate of reproduction cost should con-

tain some allowance for taxes during construction, as taxes, in some amount, would certainly have to be paid; but instead of undertaking to arrive at that amount by estimate made in the usual way, he uses an arbitrary and fixes the amount at $50,000. This arbitrary method of fixing the amount is not to be employed unless there is no better method possible. In this instance there is a better method. It is possible from data furnished by the evidence to make a reasonable estimate of the amount. As such data we have the value of the entire amount of property to be reproduced, the period of time covered by the construction, the rate of taxation and the amount of the yearly taxes on the entire property of complainant in Michigan for the years 1910 to 1913 inclusive. From these data it is possible to estimate the minimum amount that would beyond a reasonable doubt, have to be paid.

Taking three years as the period of construction, there would be taxes paid on a portion of the property in each of the three years. The amount of the taxes would depend upon the amount of property which would be subject to taxation in each year. Those amounts cannot be accurately known, but must be estimated. From the total amount there must be deducted the proper amount for land values, as, according to the Minnesota rate decision, that value is one upon which complainant is not entitled to interest during construction, and presumably taxes also.

It will not be accurate to assume that the property will be acquired at a uniform rate during the three years, but it will be sufficiently so for the proposed estimate. Making that assumption, there would be some portion of the property subject to taxation in the first year, but it would be small and will be omitted from this estimate.

In the second year there would be a larger amount, which it is safe to say, would not be less than one-third.

In the third year, there would be a still larger amount which may be safely estimated at not less than two-thirds.

On this basis there would be taxes paid during construction equal to one year's taxes on all the property, which, for the past four years has amounted to more than $200,000 each year. This I consider a fair and reasonable estimate and if it is so my allowance of $100,000 is an amount which would, beyond all reasonable doubt, have to be paid for taxes during construction.

It is possible to make an estimate of the amount of property that would be subject to taxation during construction, based upon Mr. Hansel's testimony with reference to interest during construction, and his estimate in connection therewith of the time required for the construction of the road. The value of Schedules 3, 5 and 29, which are grading, bridges, trestles and culverts and the engineering thereon, as I have found such values, is approximately $3,500,000. It seems impossible that the property in this schedule should not be on two assessment rolls during construction. In one assessment only a portion of its value could be covered and in the other presumably its whole value. Taxes on this item would be $70,000 if it were assessed only one year. It seems impossible that the item "Ties" under Mr. Hansel's testimony should not be on the assessment roll for more than one year. Assuming, however, that it is on for only one year, $6,000 of taxes would fall upon it. The value which I have fixed upon Schedules 7, rails, 8, track fastenings, 9, frogs, switches and crossings, and 16, sidetracks, aggregates $1,885,000, and if only $700,000 of this amount was taxed for one year, it would make up, with the items just above discussed, the full amount of my allowance. There would remain $2,200,000 of physical property, a considerable portion of which would fall under some assessment.

This estimate thus based on Mr. Hansel's testimony shows that my allowance of $100,000 for this item is a very conservative one. It in no way conflicts with Mr. Hansel's allowance of $50,000 for taxes during construction as that allowance was purely arbitrary, and was made, it would seem, from the testimony on the assumption that some special arrangement would be made with the taxing officers by which a portion of the taxes which the property would regularly be required to pay would be waived or remitted.

I therefore find the present value of this schedule to be: Interest during construction, $547,657; taxes during construction, $100,000. The interest item has been assigned to the different services in accordance with the allocations to the different services of the schedules on which the same is computed. The allowance for taxes I have apportioned to passenger, freight and common on the basis of all my other property allocations except lands.

Schedule 41.—Furniture and Fixtures.

I find that the present value of the items contained in this schedule is $9,735.00 all allocated to common. There is no dispute between the parties on this schedule.

Schedule 42.—Stores and Supplies.

Schedule 43.—Working Capital.

In addition to the property embraced in the foregoing schedules, it is necessary for the railroad company to have and keep on hand ready for use, a considerable quantity of money and other property to supply current needs and meet current expenses. Such money and other property together constitute what may be properly called

working capital, and they have generally been so treated in standard works on the valuation of public service corporations and I so treat them here, although in the inventories submitted, money is placed in a schedule entitled "Working Capital" and the other property in a separate schedule entitled "Stores and Supplies".

In Whitten's Public Service Corporations, Vol. 1, Chapter 14, page 288, it is stated that

> "In many rate cases, no mention is made of working capital and it does not seem to have been included at all, except as covered by the allowance for stores and supplies. No rate case has been found, however, in which there is recorded a refusal to allow for working capital."

By my own examination of the cases on the subject, I find no case where the question was involved, either before a court or before a commission engaged in valuing a public utility property, where there was a failure to allow for stores and supplies, nor where the question was directly presented, a refusal to allow for working capital.

It seems to me entirely clear that the stores and supplies which a railroad company, in the ordinary course of its business, keeps on hand for the purpose of carrying on its business, is property upon which it has a right to earn a return.

It appears from the evidence in this case that the Michigan proportion of stores and supplies which complainant had in stock on June 30th, 1913, was $308,502. The complainant contends that this figure should be adopted in fixing the value for this schedule, while the defendants contend that there was an unusual amount of stores and supplies on hand in 1913, and insist that the average of the three years, 1911, 1912 and 1913, would more nearly represent the proper amount. I have concluded to adopt

an average of the three years. I therefore find the present value of this schedule to be $272,811, which should be allocated as follows:

Passenger	$ 2,844
Freight	5,557
Common freight and passenger	264,410

Cash Working Capital.

The defendants claim that no allowance should be made for a cash working capital. I am unable to conceive how the complainant can do its business without a cash working capital of some amount. But I find that courts and commissions have had great difficulty in determining the proper amount to be allowed on this account, and that the proper amount must finally rest in sound judgment.

It is in evidence in this case that the complainant must meet a monthly pay-roll, the Michigan proportion of which is from $120,000 to $150,000. It certainly must keep on hand for other purposes considerable amounts of cash. It is in evidence, further, that its average monthly balance in the hands of its treasurer in the fiscal year 1913 was $205,536. I do not believe that this amount is more than is reasonably required to meet the exigencies of the business of the road, or more than will be required in the future. I have apportioned a portion of this to Wisconsin on the basis of track miles, and I find the Michigan proportion to be $167,107.00, all of which is allocated to common.

The defendants in opposing any allowance for cash working capital contend that the complainant could and should obtain interest on daily bank balances sufficient to pay a fair return on such cash working capital. If it is a fact that such an amount of interest could by proper management be realized on daily bank balances, then that fact would constitute a good reason for refusing any al-

lowance for cash working capital. There is no evidence in the case from which I can find whether such is or not the fact, and as there is no presumption that it is a fact, I cannot on that ground, refuse to allow for cash working capital. Perhaps, on a full trial of this particular question, it would appear that some reduction in the allowance for cash working capital should be made on account of the possibility of earning interest on daily bank balances, but there is no evidence in this case from which the amount of such reduction could be estimated.

Treating stores and supplies as a part of working capital, as in a proper sense they are, my allowance for such total working capital is about 12% of the annual gross business of the company, and I find that the allowance on this account in the reported cases appears to run from ten to fifteen per cent of the gross business.

The amount of stores and supplies shown by complainant's inventory is less than the amount required, because their inventories of stores and supplies are taken as of June 30th in each year, at which time stores and supplies are below the average in two very important items. It is in evidence that the coal supply of the company is brought in during the season of navigation on the Great Lakes, and would be must larger at the close of navigation than on June 30th. It is also to be deduced from the evidence that the ties used each year are in the main produced during the winter months, when timber operations are chiefly carried on in the Upper Peninsula, and are largely distributed on the line and charged out of stores and supplies before June 30th, so that the amount which I have taken for stores and supplies is not the average amount throughout the year, but those on hand at a time when there was less than an average amount of both coal and ties in the inventory.

To the foregoing determination with reference to these

schedules 42 and 43, defendants object (Objection No. 5 (c) (18), on the ground that the amounts allowed for both Stores and Supplies and for Cash Working Capital, respectively, are too large, and claim that the aggregate should have been no more than the amount which was allowed for Stores and Supplies alone.

This objection, it seems to me, views this subject from a wrong angle, and assumes that the question is what amount of stores and supplies and working capital is required to properly carry on the business of complainant's railroad.

Such is not the inquiry. It must be borne in mind that the complainants are entitled to a return on the value of the property actually employed in carrying on their business, and that the inquiry here is, what is the value of that property? The stores and supplies and the cash working capital included by me in the inventory are a part of the property actually employed in carrying on complainant's business, and as such is as clearly entitled to a return as any other part of the complainant's property that is so used.

And it is no more incumbent on the complainant to prove by testimony in the first instance that these amounts are not excessive than it is incumbent upon them to prove that the number of locomotives or cars possessed and used by them is not excessive. The fact that these amounts of property are used by them in carrying on the business presumptively entitles the complainants to a return on their value, unless and until it is alleged and appears by evidence that the amounts are in excess of the requirements of the business. No such issue has been raised in this case, and there is no testimony tending to show that the amounts are larger than are reasonably required for the carrying on of the business. On the contrary, as I have explained in my finding, the evidence

shows that the amount for stores and supplies is the average for three years of the amount actually kept on hand in the ordinary course of the business. And as regards cash working capital, the evidence shows that the amount which I allowed was the average of the monthly balances for the year 1913; that that average was less than the average for the three previous years, and that if I had taken the average for the same years that I did for stores and supplies, my allowance would have been $198,140.

This objection, therefore, asks me to make a finding which there is no testimony to support—a finding that the complainant has on hand and for a considerable time has been keeping on hand a greater amount of cash working capital and stores and supplies than the business requires, although there is no testimony to that effect, but a very strong presumption that the company would be prevented from doing so by the exercise of ordinary business prudence and judgment.

Depreciation and Appreciation.

Depreciation.

In my valuation I have allowed for depreciation on all elements of the property where any depreciation has been shown by the testimony to exist, and the values therein determined are the present values of the different schedules as depreciated.

In the depreciation of those values I have in every instance, with reference to physical property, adopted either the estimate of the same made by Mr. Hansel or that made by Mr. Riggs, and therefore the manner in which each of these values is arrived at, and the amount of reproduction cost and of depreciation may be seen by referring to the testimony of said witnesses.

Appreciation and Going Concern Value.

We have now completed the consideration of complainant's property, as formally inventoried in their schedules. But it is claimed by complainant that the value of the property so found should be increased by two elements of value not yet considered, viz., that which arises from appreciation produced by adaptation and solidification of road-bed and cuts and fills and also the appreciation which arises from the fact that the property is now organized and in operation as a going concern. These additional elements of value it remains therefore to consider.

Appreciation.

This element of value as described by complainant is that which

> "accrues to a railroad from the settling and solidification of its banks, the gradual cleaning out of its cuts, and the sodding of its slopes; and which, element of value comes only by constant work on the roadbed and by lapse of time."

The amount which it is claimed should be added for this element of value was first stated at $650,814; but was afterwards changed to $553,000.

To this claim the defendants object and insist that it should be entirely rejected on three distinct grounds of objection:

1. That on the basis on which it is included in complainant's claims it has already been included in the physical items of the appraisal.

2. That its creation involved no capital expenditure but was paid for out of operating expenses.

3. That there is no sufficient proof that it exists, or of its amount of value.

As the item of appreciation thus objected to is of large amount and might conceivably become the pivotal point in the case, it requires to be carefully considered. The three objections above made will be considered in their order.

1st Objection. This objection involves a misconception of the function of reproduction cost as a basis of valuation. In saying that the "increase in value has already (i. e., in determining reproduction cost) been included in the physical items of the appraisal" it assumes one of two things, viz.: either that reproduction cost new necessarily includes all the elements of value that there can be in the thing under valuation, or else that the process of figuring reproduction cost in a rate case does not end with the determination of cost new, but is carried forward in some way so as to determine what would be the cost of reproducing an old thing with all its peculiarities resulting from use and age. Neither of these assumptions is warranted. The particular element of value here in question does not enter into the property until long after all the cost of reproduction new has been incurred; and it therefore could not possibly have been included therein as claimed in the first assumption. Hence, it cannot be included at all, unless the supposed process of reproduction is continued after the completion of reproduction new through sufficient time and use to bring the thing into its present state of condition old, as is assumed in the second assumption. As this second assumption is involved in the second objection, its correctness will be there considered.

2nd Objection. This objection to the value in question, on the ground that its creation involved no capital expenditure, but was paid for out of operating expenses fails to distinguish properly between value and reproduction cost, and involves the assumption above stated that

the process of supposed reproduction does not cease with reproduction in condition new, but is carried forward to the existing state of conditions old. The objection well illustrates the difference between reproduction cost and replacement cost, and also the reason why, in defining the kind of value required in a rate case. I have defined it as a replacement-cost value rather than a reproduction-cost value. Reproduction cost value is the amount which it would cost to reproduce the thing valued new (as that is the only condition in which it could be reproduced)—replacement cost value is the amount for which the law presumes it could be replaced, i. e., purchased in open market—that amount being determined by ascertaining the cost of reproduction new, deducting therefrom the percentage of depreciation found to be now existing and adding such appreciation, if any, as is found to have resulted from any improvement in the present condition of the property over the condition that it would be in when newly constructed.

This broad distinction thus seen to exist between reproduction cost and present value in a rate case is in this objection entirely lost sight of, where, instead of recognizing it, the objection assumes that the hypothetical reproduction employed here is a reproduction of the property in its present condition as regards depreciation and appreciation and that the value of the property is the net cost of such reproduction. Now, it will be seen that this involves a fundamental misconception of the theory of determining value on the basis of reproduction cost. Such a supposed reproduction would necessarily be assumed to cover a period of about ten years—three years for construction, in order to produce the property in condition new, and seven years of imaginary operation and maintenance in order to produce the property in its present condition as regards depreciation and appreciation; and

the amount of reproduction cost under this theory would depend upon the profitableness of the seven years' imaginary operation. It is evident that such a theory of reproduction cost is impossible of application, and wholly different from the hypothetical reproduction contemplated by the theory now in use of determining value on the basis of reproduction cost. That theory does not concern itself with either the past or the future of the property under valuation; it merely values the property as it exists today without any regard to ownership or method of acquisition, or whether its value or any part of it was paid for out of operating expenses or paid for at all, as all such considerations have no bearing whatever on the question of present value. And in so valuing the property as it exists today, it proceeds upon the assumption that the fair value of the property in its present condition as a basis of rates is the amount which it would cost to reproduce it new less the percentage of that amount which would correspond to the percentage of depreciation from condition new found in the present condition of the property, plus the amount of any element of value possessed by the property in its present condition which was not possessed by it in condition new.

The precise function of reproduction cost in a rate case thus indicated is very clearly made to appear in the following language used in the Minnesota rate decision, viz:

> "When an estimate of value is made on the basis of reproduction new, the extent of existing depreciation should be shown and deducted. If there are items (meaning items of property) entering into the estimate of cost which should be credited with appreciation, this also should appear, so that instead of a broad comparison there should be specific find-

> ings showing the items which enter into the account of physical valuation on both sides."

It is thus the cost of reproduction new (not old) that the theory in question contemplates; and the function of this cost new is to serve as a "basis" on which present value is to be determined by deducting from it the amount of depreciation, and adding to it the amount of appreciation found to exist in the property in its present condition as compared with what would be the condition of the same property when newly constructed.

In this case, the cost of reproduction new of each item and the amount of depreciation to be deducted are found and set forth in parallel columns in the several inventories. The item in connection with which the appreciation in question is claimed is that of grading and is found in Schedule 3. Logically the item should, as stated in complainant's brief, be carried as a part of that schedule as it is an element of the value of the roadway constructed by grading; but it is not so carried by complainant for the reason, as stated in their brief, that " it is an element of value on which no overhead charges should be figured, it having accrued subsequently to the creation of the overheads." Perhaps the item would have received different attention and therefore could have been better carried in immediate connection with Schedule 3, but whether so or not is a matter of form and does not affect the substantial question whether this large amount for appreciation of roadbed should be added to the total value of the schedules, on which question there now remains to be considered the defendants' third ground of objection.

3rd Objection. This objection insofar as it relates to the existence of the element of value in question, is not well taken. There is an abundance of testimony on both

sides to the effect that this element of value exists in the complainant's railroad and there is no testimony to the contrary. It is testified to by complainant's witnesses, Riggs, p. 249; by Young, pp. 865-6; by Cooley, pp. 5713-15, and by defendants' witness, Hansel, pp. 4952-3.

With regard, however, to the amount of the value reckoned in dollars and cents, the objection is more serious. The only testimony which bears directly upon this question is that of Mr. Riggs, found on pages 249-50, as follows:

> "Q. Taking the items in this Schedule 3 which have not been depreciated, the earthwork, grading, for example, at 100 per cent, that is, assumption that the work was in the same condition as if presently graded, confining ourselves now to the grades, cuts and fills?
>
> "A. That is upon the assumption that the work is worth as much as it would cost to produce a new like structure.
>
> "Q. Your appraisal is the cost of reproduction new?
>
> "A. Yes, sir.
>
> "Q. As to its values, as to the value of the cuts and fills of this railroad, as compared with the value of the same cuts and fills if they were new now; I mean measured by service-ability, expense of maintenance, safety and economy of operation, and all those things; what is the truth in that regard?
>
> "A. The cuts and fills on this road are in a condition today of absolute stability due to settlement, due to the fact that all of the erosion by water and various other forms of sloughing and settlement that will take place, have taken place, and that many, or I may say, most of the embankments and slopes of cuts have become sodded over. The roadbed of

the company is in very much better condition today than a new, green, unseasoned roadbed would be.

"Q. Why better?

"A. There will be no settlement, and the expense of maintenance is less, very materially less on an old, well seasoned roadbed that has become thoroughly adapted to conditions of drainage that are formed or created by the construction of roadbed.

"Q. How about the amount of labor required to maintain it, the roadbed, in the condition that the roadbed of this company is in, compared with the same if it were new?

"A. In my judgment, the cost of track maintenance would be increased on an average by the addition of two or more men per section for the first six or seven years, to take care of the work of cleaning out of cuts and of replacing earth around embankments that had sunk down or been washed away."

The objection to the making of a finding of value on the strength of this testimony is two-fold; first, that it is not sufficiently definite to form a basis for such finding, and second, that it was introduced for another purpose, and is now being used as an afterthought for a purpose which was not in the mind of either counsel at that time; and that defendants have therefore had no opportunity to offer opposing testimony.

As an appreciation in value has been shown to exist, and as it is necessary to take that appreciation into account in order to arrive at the true value of the property, and as it cannot be so taken into account until its amount has been proven, it is clear that the question as to what that amount is, ought to be squarely presented and be made the subject of such proofs as either party may desire to offer. In the present condition of the proof, it cannot be claimed by either party that this has been done.

The result is that I am reduced to the alternative of either giving effect to the unanswered evidence of the complainant's witness as claimed by the complainant or else rejecting that evidence as improper or insufficient, and thereby throwing out the claim for appreciation as the defendants claim should be done.

In my judgment, neither of these alternatives would be a fair disposition of the subject of appreciation, as either alternative would tend to deprive one or the other of the parties of the right to a full and fair trial of this question of appreciation.

With regard to the present condition of the proofs on this subject, it cannot, I think, be fairly said that either party has been seriously at fault; and if it can be so said, I think that such fault should not, in a case of this nature, be permitted to stand in the way of a full and fair hearing of the question on its merits—the case being not one in which merely two private parties are concerned, but one in which the entire public is concerned, and in which it is to the interest of all concerned that substantial justice be done.

As the fact of appreciation is proved by uncontradicted evidence, and as there is some evidence of the amount of that appreciation, which evidence is uncontradicted, and as the complainant is clearly entitled to the amount of the appreciation when shown, it seems to be clearly my duty to give effect to the evidence as to the amount of appreciation, and allow the amount thereby shown for appreciation in the value of the complainant's property; but with the recommendation, however, that this finding be neither approved or disapproved without first giving opportunity for a fair trial of the question by the introduction of further evidence by each party.

In estimating the amount to be thus provisionally allowed for appreciation, I find that the amount of $553,000

is too great, that it was evidently computed on the assumption that the extra section men employed on the new road, as compared with those required on an old road, would be employed during the entire year, whereas they would be employed not more than seven months in the year. Computed on the basis of seven months, the cost of such extra employment would amount to approximately $318,000.00 and I have fixed the amount to be allowed for appreciation at $300,000.00.

That my allowance of $300,000 for this item of appreciation is conservative I am fully convinced, in view of the testimony of all the witnesses as to the greatly increased value of complainant's roadbed by reason of adaptation and solidification, and my conviction in this regard finds further confirmation in the fact that in the Mnnesota rate cases, the State conceded that the adaptation and solidification of the roadbed of the Northern Pacific Railroad amounted to the sum of $1,613,612, which was over 15% of the remainder of the grading item as found by the Master, whereas the allowance which I have made is less than 11% of the remainder of my grading schedule.

As to the propriety of this allowance, the only possible question is the above described quetsion as to the sufficiency of the evidence as to its amount. That there has been some appreciation in the value of the property is shown and not disputed; that in order to reach a proper estimate of the value of the property under the method of valuation employed in rate cases, any appreciation in value that has taken place must be added to reproduction cost less depreciation, there is no room for question either on authority or on principle. In such method of valuation, depreciation must be allowed, and depreciation cannot be allowed without the allowance also of appreciation. The two are there vitally and inseparably con-

nected. The latter is the necessary corollary of the former. Every reason which calls for the allowance of depreciation calls equally for the allowance of appreciation. The ground on which depreciation is allowed in such method of valuation is that it is a necessary step in determining the amount that it would cost to acquire the property in its present condition as regards depreciation, it being assumed that the purchaser will be willing to pay for the property, its cost of reproduction less existing depreciation. But to determine value it is not enough to find only what the purchaser will be willing to pay; it is equally necessary to find what the vendor will be willing to accept, and in finding this, it is just as necessary to allow for appreciation as it is to allow for depreciation in finding what the purchaser would be willing to pay. In this case the allowance for depreciation on the entire property amounts to a very large sum—being in excess of $2,000,000, and it is allowed because it appears that such depreciation exists. But it also appears that while that depreciation was taking place, some appreciation was also taking place, and it would be a manifest injustice and an irrational application of the method of valuation employed to deduct $2,000,000 from reproduction cost on account of existing depreciation and fail to add anything on account of existing appreciation.

It is for this reason, viz., that the valuation would be clearly incomplete and unjust if no appreciation is allowed, that I have made the above allowance and recommendation.

Going Concern.

The claim of an amount to be allowed in the valuation, because the property constitutes a going concern must be rejected for two reasons, either of which is ample. In the first place, if there is any such value, there is no proof

from which the amount of it can be found. In the next place, any such value, if found, must depend directly upon rates and would therefore be a kind of value that can find no place in a rate case. The "Concern" could not be made to "go" at a profit unless the rates permitted it, and, given the business, the higher the rates, the greater the profits, and the greater the profits, the higher the rates insofar as the rates would be predicated on a going concern value.

By the courtesy of counsel for defendants, my attention has been called to a decision rendered by Judge Sessions in the case of the Ann Arbor Railroad Company vs. Grant Fellows, et al., wherein the question of the allowance for certain costs therein called "Overheads" was involved.

From a careful study of that entire opinion, my conclusion is that the learned Judge, notwithstanding that he used expressions with reference to contingency allowances, that might at first blush seem to be of general application, did not therein intend to lay down any general rules or principles applicable in all rate cases either to contingencies or to any other so-called overhead allowance, but that in his remarks he was confining himself entirely to conclusions to be drawn from the testimony in that case.

Deductions from Inventory by Reason of Property Located in Michigan, but Which is Also Used for Wisconsin Operations.

The general shops of the complainant are all located at Marquette, in Michigan, and perform work for the railway system as a whole. Defendants contend that a proportion of the value of these shops should be deducted from the Michigan value and assigned to the Wisconsin business. They also present the same argument as to

the Thomaston round-house, which is near the border line between Michigan and Wisconsin, and which houses locomotive that run in Wisconsin, as well as locomotives that run in Michigan.

In recognition of this contention, I have deducted from my Michigan values the portion of the value of the general shops which should be attributed to the Wisconsin business, using as a basis for arriving at this apportionment the percentage of miles of main line track of the complainant in Wisconsin to complainant's total mileage of main line track, viz., 18.3%. I have applied this percentage to the different items of these shop buildings, of the land on which the shops are situated, of the sidetracks used in connection with the same and of the machinery therein.

As to the Thomaston round-house, the engines housed there run as far west as Superior, Wisconsin, and as far east as Marquette, Michigan. I have therefore deducted from the total value of this round-house and of the land on which the same is situated, the portion of such value which should be attributed to the Wisconsin business, using as my basis for this apportionment, a percentage derived from the relation of the miles of main line track from Superior to the Wisconsin and Michigan State line to the total miles of main line track between Superior and Marquette, viz: 41.9%.

The total deductions from the inventory by reason of these apportionments of values to the Wisconsin business amounts to $42,459, all of which has been deducted from the property of the complainant in Michigan. To these deductions I have also added all overhead charges computed upon the same, amounting to $1,449, making a total deduction of $43,908.

The detail of these deductions is as follows:

Schedule.	Total Value.		Assigned to Wisconsin.
1. Lands on which Marquette shops and tracks used in connection therewith are located	$23,252	18.3%	$ 4,255
1 Lands (Thomaston round-house)	130	41.9%	54
16 Shop tracks and switches at Marquette and Thomaston			4,403
19 & 28 Shop buildings at Marquette used for general purposes	51,678	18.3%	9,457
19 Round-house at Thomaston	18,804	41.9%	7,879
20 Shop machinery and tools	89,676	18.3%	16,411

The allocations of these deductions are as follows: Passenger $102. Freight $720. Common $43,086.

The totals above given, and also the details, differ from those given in my tentative report, for the reason that, having adopted the estimate of defendants' expert, Mr. Hansel, of $50,000 for the legal expenses in Michigan, the overheads on these deductions were necessarily changed, and also because, through a clerical error, 41.9% of the shop tracks at Marquette had been assigned to Wisconsin instead of the 18.3% thereof which I intended to assign, and certain tracks at Marquette and Thomaston had been omitted.

In addition to the above deductions, I have, as explained under Schedule 17, deducted from that schedule $1,685 on account of the Marquette passenger station,

the second story of which is used and occupied by operating officials and their clerks.

Inasmuch as this property is all located in Michigan, is taxed as Michigan property, and is necessary for the performance of the Michigan business, and would be just as necessary if there were no lines of complainant in Wisconsin, I am in grave doubt as to whether the entire value of such property should not be assigned to Michigan. I have, however, in this intsance, as in all others, followed the rule of resolving doubts in favor of the defendants.

Exclusion From Inventory Claimed by Defendants.

The defendants claim that the inventory of complainant's property should not contain any property or values of the following description:

1. Property not in public service.
2. Property furnished by industries.
3. Property used by others.
4. Value of clearing and grubbing.
5. Property contributed by the public.
6. Property of the Mackinac Transportation Company.
7. Property supported by interest or sinking funds.
8. Property newly acquired.
9. Property created by operating expenses,

and that whenever any such are included, they should be deducted.

Of these several descriptions, numbers 1, 2 and 3 are covered by the principle adopted and adhered to throughout this report that only such property is to be included in the inventory as is in use in the service to which the rate in question applies.

Numbers 4, 5 and 6 have been dscussed under their respective schedules.

As regards 7, it is, of course, true, as a principle, that when the return to which the company is entitled on the value of a certain piece of property is realized to any extent in the form of interest paid directly to bondholders or others, such interest will constitute *pro tanto* the required return on the property, and to the extent that it does so, the property is not entitled to a return in railway fares. But there is no property in complainant's inventory that calls for the application of this principle, as the only property against which the defendants aim this claim is the complainant's one-third interest in the International Bridge at Sault Ste. Marie,—a property that can have no effect upon this case, as it is all allocated to interstate.

Numbers 8 and 9 are covered by what was said relative to Numbers 1, 2 and 3; and also by the principle likewise adhered to in this report that all property should be included in the inventory that is in railroad use in the service to which the prescribed rate applies without regard to its ownership or to the time or manner of its acquisition. It must be constantly borne in mind that this case involves three main questions and only three, viz., (1) What is the value of the property used in rendering the service to which the prescribed rate applies? (2) What will be the probable net earnings derived from the use of the property under the prescribd rate? and (3) Will those net earnings be sufficient to constitute a fair return on the value of the property? and that therefore the case involves only such subordinate questions as are necessarily involved in determining these three main questions. As the purpose of the inventory is to determine the value of all the property employed in the service, all the property so employed should be included and the

question whether any particular property should be included or excluded depends entirely on whether it is so employed. In a number of the claims made by defendants in the case, this principle seems to have been lost sight of; for example, amongst the claims above enumerated, numbers 5, 8 and 9 assume that the question whether certain property should be included or excluded does not depend on whether it is so employed, but upon something else; that although so employed, the property should be excluded if it was donated by the public, or was recently acquired or was created out of moneys which had been charged up to operating expenses. These claims assume that the issue to be tried here is not whether the prescribed rate will pay a fair return on the value of all the property used in rendering the service to which the rate applies, but whether it will pay such return on only some portions of that property—that some portions of the property so used have been acquired in such a way that the company is under obligations to donate the use of them to the public, and that they should, therefore, be excluded from the inventory, and also that we must here inquire into and determine all such questions as may thus be raised. In my judgment, all claims of this character in a rate case are entirely irrelevant. In a rate case, the status of the company in its relations to the state and to its property is defined and determined by the law under which the company is organized, supplemented by existing constitutional guaranties and not by the innumerable other considerations which might otherwise be urged as bearing on the general equities as between the company and the public.

If this view is correct, the claims numbered 5, 8 and 9 are irrelevant. But in any event they are in my judgment, not sustainable. As regards No. 5, that property donated should be excluded—this claim is based on a

theory that where complainant receives property as a gift, it thereby becomes obligated to use the property in the public service without charge. Such a theory is self-contradictory. It is of the very essence of a gift or donation that the thing donated becomes the property of the donee with the right to its full beneficial enjoyment and free from all obligations. If, in receiving the property, the recipient becomes bound to perform some obligation imposed by the terms of the grant, the acquisition is not a gift, but a purchase. Certainly no such obligation as is claimed can be held to arise by implication from a gift or donation.

Claims number 8 and 9 might be relevant to the question as to what should be taken as a typical year as a basis for forecasting the future, but not to the question of exclusions from inventory. Thus, as regards number 8, if, in a certain year, a large amount of property newly acquired, the rate of return on the value of the property in that year might be thereby rendered abnormal to such an extent that the results of that year could not be used without modification as a basis for forecasting the future, but that fact would furnish no reason for excluding the property from the inventory.

Similarly, as regards Claim Number 9, if it appears that some portions of the property inventoried were purchased with money that was charged up to operating expenses in some particular year, it is clear that such charge was improperly made; that in consequence the accounts do not correctly show the operating expenses for that year and should be corrected; but such error would furnish no ground for excluding the property so acquired from the inventory, nor would it have any relevancy to this case, except as it would have a bearing on the question of using the results of the particular year

in which the error occurred as a basis for forecasting the future.

To the foregoing disposition of their claim with reference to property alleged to have been created out of operating expenses, defendants object (Objection No. 6).

Objection 6. This objection assumes that there is certain property in the inventory which was purchased by the company and paid for with money that was charged up to operating expenses, and claims that all such property must be omitted from the inventory, because it was thus purchased and paid for.

The question thus raised is covered by the principle adopted and uniformly applied by me throughout the case that the property on the value of which the company is entitled to a return is the property used in rendering the service to which the prescribed rate applies, without any regard to the ownership of the property or how that ownership was acquired.

If there is, as assumed, property contained in the inventory which was paid for by the company out of moneys which were charged up to operating expenses, the effect and only effect of that would be that the account of operating expenses for that year would be too large by that amount; but that would constitute no ground for excluding the property from the inventory or have any bearing on the question whether it should or should not be excluded.

I am again referred to the case of Cumberland Telephone Company vs. Railroad Commission, 212 U. S. 424, as authority for defendants' contention that property purchased or created out of operating expenses must be excluded from the inventory in this case.

I have carefully considered this case, and I cannot find

that it involves any such question or that there is in it any decision showing or tending to show that where a valuation is involved, property acquired out of operating expenses is not to be included in the inventory.

In that case the State claimed that the accounts of the company showed that it was demanding a return upon its impaired capital as though the same were unimpaired, and, in addition, was demanding a return upon a depreciation fund created for the express purpose of making good the impaired capital. In a case involving valuations this would clearly be the equivalent of duplicating property values.

The lower court held that the burden was upon the state to prove that the accounts did so show. The Supreme Court reversed the case, upon the ground that the burden was upon the company.

Division of Common Property Between Passenger and Freight.

After assigning to the two services respectively all the property that can be allocated to either there is a large part of the railroad's property which is used in common by the two services in such a way that no part of it can be assigned to either service as being used exclusively therein. But it is necessary to determine what portion of this common property the passenger earnings should pay a return upon and therefore necessary to find some basis for dividing the same between the two services.

In the Minnesota rate cases, the common property was divided in the lower court on the basis of the gross earnings in each service; but this method was distinctly disapproved by the Supreme Court on appeal and the question as to what the basis of division should be was thus left and still remains an open question. As bearing upon the question, however, the court there stated as follows:

"When rates are in controversy, it would seem to be necessary to find a basis for a division of the total value of the property, independently of revenue, and this must be found in the use that is made of the property. That is, there should be assigned to each business that proportion of the total value of the property which will correspond to the extent of its employment in that business. It is said that this is extremely difficult; in particular, because of the necessity for making a division between the passenger and freight business and the obvious lack of correspondence between ton-miles and passenger-miles. It does not appear, however, that these are the only units available for such a division; and it would seem that, after assigning to passenger and freight departments, respectively, the property exclusively used in each, comparable use-units might be found which would afford the basis for a reasonable division with respect to property used in common."

I think that in this expression, the Supreme Court recognized the difficulty, if not the impossibility, of dividing the property with mathematical accuracy and required only the making of such a division as would, all things being considered, be fair as between the two services.

For a number of items of the common property bases of division may be found from the evidence which are satisfactory to both parties and are agreed to by them. The items and the bases agreed upon are as follows:

Schedule 23. Fuel Stations: It is agreed that the items in this schedule should be divided on the basis of the amount of coal consumed in each service respectively. This division, using the figures of 1913, assigns 29.56 percent of the whole to the passenger service.

Schedule 22. Water Stations, it was agreed might be divided on the same basis as fuel stations, and I so find. The division assigns to the passenger service 29.56 per cent.

Schedule 10. Shops, Engine Houses and Turn Tables, it was agreed, might be divided on the basis of locomotive housings, and I have so divided them.

It was agreed that the following, viz:

Schedule 20, Shop Machinery and Tools;
Schedule 21, Roadway and Construction Tools; and
Schedule 42, Stores and Supplies,

might be divided on the basis of the relation between all the other assignments made to freight and passenger. I have so divided them and such division assigns 30.22 per cent to the passenger service.

Schedule 43. Working Capital I find should be divided on the same basis as the schedules last above mentioned.

The detail of these divisions will be found on page 2 of Exhibit 1, hereto attached.

By these methods we are thus able to divide the common property embraced in the foregoing schedules; but such property is but a small part of all the common property. The great bulk of the common property remains to be divided, and as none of the methods of division above employed are applicable to it, some other method or basis of division must be found. It is tacitly recognized by both parties that any basis of division that will properly divide any part of this remaining property, will divide all of it, and a different basis for such division is proposed by each of the parties.

Before considering these proposed methods, let us recur again to the language above quoted from the decision in the Minnesota rate cases and see precisely what it is that we are required to do. From the language there

used, it is seen that we are required to divide the common property between the two services in proportion to the use of the property made by each service, and in order to find such proportion, we must measure the use made by each, and in doing so, must employ such units of measurement as will enable us to compare the extent of the one with that of the other, i. e., by comparable units of use. The first step therefore, in the task of making this measurement is to find comparable use-units. What are the units of use that will answer this purpose? To this question, the counsel on each side in this case have proposed an answer in the method of division which he proposes, which is as follows: On behalf of complainant, it is claimed that the use to be measured consists of the moving of revenue producing trains, and that the division is to be made on the basis of the distance (measured by miles) traveled by the trains in each service which earn a revenue, i. e., on what is known as the revenue train mile basis, the mile being the unit of measurement. On the part of the defendants, it is not disputed that the use to be measured is that which is involved in the movement of revenue trains, but it is claimed that that use should be measured, not by the distance moved by the trains, but by the time occupied in their movement.

As between these two methods of measurement, we are, of course, to accept and employ the one that will most accurately measure the extent of the use.

Now it is evident that each of these two kinds of units will, in a certain way, measure the extent of the use, but not in the same way. The extent which one will measure is not the same extent which the other will measure. The fact is that the use in question has two kinds of extent—an extent in time and an extent in space—and the two kinds of units of measurement pro-

posed, correspond to these two kinds of extent. Our choice between these two kinds of measurement therefore, depends wholly on which of these two kinds of extent it is that we wish to measure. What kind of extent is it that we want to measure—that of time or that of space?

In seeking to answer this question, we find that what we have to choose between is not in reality two kinds of extent, but two kinds of use, viz., a movement use and an occupancy use. The extent in time which the defendants propose to measure by a unit of time is an occupancy use, and the extent in space which the complainant proposes to measure by a unit of distance is a movement use. Both of these two kinds of uses are involved in the operation of trains, and the question is, which kind of use is it that we should measure for the purpose in hand? The obvious answer to that question is that it is the principal use, the particular use, which most directly and effectually accomplishes the purpose or object sought to be accomplished by employing the property. That purpose is, the transportation of passengers and freight from one place to another, and this being so, the principal use is, of course, the movement use by which that transportation is accomplished. This use involves, in some degree, an actual physical occupancy, and therefore an occupancy use, but that occupancy use is incidental and subsidiary to the movement use, and is of only a very small portion of the property during a very small part of time. The extent of time of this fitful, transient and partial occupancy clearly afford no reasonable measure of the use of the property made by each service in the operation of its trains, although it might do so under other conditions, where time of occupancy was important and the one service was curtailed or otherwise affected

injuriously by the continued exclusive occupancy of the property by the other service.

Time of occupancy may be, and frequently is the true measure of the extent of a use, as for example, the use of money which is paid for in interest computed on the basis of time, or the use of property which is paid for in rent, also computed on the basis of time. In fact, it is just such a use of property to be so paid for on a time basis that we are trying to apportion, viz., the joint occupancy or use of all of the common property all of the time by the two services, freight and passenger. This joint use it is that the public is required to pay for in freight and passenger tariffs—the whole amount to be paid by both services being in the nature of a rental and being determined by the value of the common property and the rate of return allowed, computed on a time or per annum basis. It is for the purpose of determining what part of this joint rental each service should pay that we are here trying to divide the common property. And it is just because the occupancy is joint and not several or separate, that we are confronted with this problem. If, instead of being the subject of a joint occupancy, all the property in question were alternately occupied separately and exclusively by each service for a certain length of time, so that the combined time of all the exclusive separate occupancies equaled the time for which the public is required to pay a return on the so-called common property, the amount in the nature of rental, which each service should pay could be determined just as the entire amount of return is determined, i. e., on a time basis—each would pay in proportion to the time of its exclusive occupancy. But such is not the case. There is, in fact, a kind of separate exclusive occupancy by each service involved in the operation of the trains under consideration, but it is not an occupancy of the entire

property at any time or of any portion of the property for any definite time, but only of a very small portion of the property during a very small and indefinite fraction of the time. I cannot see how it is possible to make any rational apportionment of the whole of this joint occupancy between the two services on the basis of the time consumed by each in a series of momentary separate occupancies of small fractions of the property such as are involved in the movement of trains. The attempt to do so involves the making of an impossible combination of two unrelated bases of division, viz., the time basis (which can be used only where there is an occupancy sufficiently continuous to furnish the basis) and the basis of a particular use, viz., the train movement basis.

The fact is, that what is here called "time of occupancy" is in reality the exact reverse of that. Instead of time of occupancy, it is occupancy of time. It is an occupancy, not of certain property during a certain time, but of a certain time in accomplishing a journey or movement. The length of time which is proposed as a basis of division is that which is consumed in accomplishing a train movement. If a freight train or a passenger should stand on the common property for days or weeks, it would constitute an actual occupancy but the time of such occupancy would not here be taken into account at all. It is only train movement that is taken into account and movement can be measured only by a unit of distance. What the defendants here in reality undertake to measure is not the extent of a time of occupancy but the extent of time consumed in making a movement an extent which bears no necessary relation to the extent of the movement. To graduate the charge for the privilege of moving a train 100 miles on the common property in proportion to the time consumed in making the movement instead of on that of the distance moved,

would be irrational. It would be the same in principle as though a tollroad company should charge a horse and carriage for a journey of ten miles the same amount that it charged an automobile for a journey of fifty miles for the wholly irrelevant reason that each journey consumed the same amount of time. In the one case as in the other, the use, the extent of which is to be measured is a movement use; the extent of a movement use is an extent in space or distance and the unit by which such a use is to be measured is therefore of necessity a unit of distance.

In addition to the foregoing, it may be noted also, that in this case, the so-called time of occupancy referred to is practically of no consequence, because each service has a great superabundance of time in excess of its needs. The aggregate use of the common property made by both services is far within the capacity of the property for such use, and therefore, neither service either benefits itself or injures the other by occupying the property or a part of it during a longer rather than a shorter time. Under these conditions, it is clearly of no consequence to the passenger service whether the freight service in running a train fifteen miles, consumes one hour or three or any other number, so long as it does not curtail nor trespass upon the time required by the needs of the passenger service; and there is, therefore, no reason why the freight service should be charged with a greater amount by reason of the longer time so occupied. Nevertheless, if the extent of time consumed is to govern, where the passenger trains average thirty miles an hour and the freight trains fifteen miles the freight service would be chargeable with double the amount chargeable to the passenger service, and without any basis in equity or reason. That the proposed application of the time basis here would lead to such anomalous results is even more

apparent when it is remembered that the rapid movement of the passenger train consuming a short time is immeasurably more valuable to that service than would be the slower movement of the freight train, and that at the same time this more valuable movement would be made to cost one-half as much as the less valuable movement would cost. In other words, if the average speed of the passenger train were reduced to fifteen miles per hour, its efficiency and value would be greatly reduced and at the same time its cost (in this particular) would be increased by 100%.

My conclusion is that the extent of the use made by each service of the common property in the operation of revenue trains is to be measured by the distance moved by the trains and not by the time consumed in making this movement; that the unit of use is therefore, a distance unit; and that the property is to be divided on the basis of the number of miles traveled by the trains in each service respectively.

A further, and it seems to me a very cogent reason for choosing the distance basis of division rather than the time basis consists in the fact that the time basis is, on closer examination, found to be in conflict with the statute itself, which we are here considering, while the distance basis is in harmony with it.

The statute itself, although it does not, in terms and directly make the division in question, does make it in effect and indirectly, and makes it on the basis of distance. It does this by prescribing on the basis of distance transported the amount to be paid by each of the two classes of users of the common property in the two services. Thus, it provides that the amount to be paid by the passenger service for all its expenses, including its share of the reasonable return on the value of the common property, shall consist of the passenger fares re-

quired to be paid by each of the individual users of passenger property (both exclusive and common) and these fares are fixed, not at the rate of so much per hour or other unit of time, but at the rate of so much per mile of transportation without regard to the time consumed in effecting the transportation.

Here we have the judgment of the legislature as to the amount that is to be paid for the use of the passenger property both by the individual user and by all the users collectively—the latter being the sum total of the former; and it is an amount that is determined not by the extent of time during which the passenger is in transit, but by the number of miles that he is transported. The amount to be paid for a journey of 100 miles is precisely the same, whether it consumes two hours or a dozen.

And this judgment of the legislature thus embodied in the statute and employing the basis of distance is there followed by another and similar judgment in which also, the distance basis is employed. Recognizing the fact that owing to differences in conditions of different railroads, the amount to be paid per mile by each passenger should be greater on some roads than on others, the legislature adjudged that on some roads 2¢ per mile would be fair to the public and would yield a fair return on the value of the property employed, and on the other roads a rate of 3¢ per mile would fulfill these requirements; also that the roads on which a rate of 2¢ per mile will yield a fair return upon the property employed in the passenger service are those on which the gross passenger train earnings equal or exceed $1,200—not for every hour or other unit of time consumed by the passenger train—but for every mile of road on which passenger trains are regularly operated without any regard to the time consumed in the movement of such trains. That we are bound to presume that the legislature formed and ex-

pressed these judgments thus embodied in the statute there can, of course, be no question. Nevertheless, it is claimed in this case that we must here presume that the legislature, in forming these judgments and reaching these conclusions apportioned the amount to be paid by each service for the use of the common property on the basis of the time consumed in the movement of its trains, and as the passenger trains move rapidly and the freight trains slowly, it consequently apportioned a much greater amount to the freight service than to the passenger.

I cannot conceive how it would be possible to presume or believe that the legislature did this, even if the statute contained nothing to the contrary, and still less can I do so when, as here, the statute indicates quite clearly that a different course was pursued.

If the legislature divides the use of the common property on the basis of time of occupancy it should, in order to be consistent, and in fairness to the traveling public and to the company and to the railroads, require the two classes of users to pay for the use made by each on that basis, also, i. e., in proportion to the time occupied by each respectively. Instead of being required to pay so much per mile of distance transported without any regard to the time during which he occupies a seat in the car, a passenger should be required to pay so much per hour or other unit of time for the time during which he occupies a seat in the car, without regard to the distance that he is transported. If it is time of occupancy that constitutes the use, he should be required to pay at the same rate per hour, whether the car in which he occupies a seat is traveling at the rate of thirty miles an hour or fifteen miles, or indeed is standing still on a common side track, the use in either case being the same.

The division of property and the rate charged should certainly harmonize and be consistent with each other,

and when thus made to harmonize the company would doubtless be quite satisfied with the division on the time basis, as it would leave them at liberty to increase their passenger earnings *ad libitum* by simply decreasing the speed of their passenger trains.

The conclusion that the revenue train mile and not the revenue train hour is the proper method of measuring the extent of the use and of apportioning the burden of expense and therefore of dividing the property is supported by the weight of expert opinion, and by judicial authority. It is supported by the testimony of a large number of witnesses, who have testified in this case, having an intimate knowledge of, and a large experience in the practical operation of railroads, and it has the sanction of judicial authority, it having been adopted and used for the division of common expenses in the very recent case involving the Illinois 2¢ rate law. Trust Company of America vs. Chicago, Peoria and St. Louis Ry. Co., 199 Fed. 592-595.

That case I regard as in point here although the division there made was of common expenses and not of property; because the division here, although called a division of property, is not such in fact, but is instead merely a division of the burden of paying a fair return for the use of the common property, which is nothing more or less than one of the expenses attendant upon the rendition of the service.

I have thus considered this subject of dividing the common property at very considerable length because it is one of the most important and difficult questions in the case.

Proceeding now to the practical application of this train mile basis to the purpose in hand, we encounter, at the outset, a question as to what mileage precisely that basis ought to include. In the application of it originally

made in the case by complainant, it did not take into account any of the mileage made in switching operations. To this omission, the defendants object specifically and insist that in any appliaction of this method of division all switching mileage must be included.

This objection raises some difficult questions. If switching miles are properly classed as train miles, such of them at least as are made on the common property should, of course, be included in the basis on which the division is to be made. The question whether they are properly so classed need not be considered here as the complainant is willing to concede that they be here treated as such. It does not concede, however, that the switching miles to be so treated are, as claimed by defendants, either as regards total number or number made on the common property, and various questions are raised in this connection which it is necessary to consider.

Inasmuch as by far the greater part of the switching mileage is made in the freight service, the effect of including that mileage is to increase the freight train miles and thereby throw a greater percentage of the property and expenses on the side of the freight service. The division of common property arrived at by complainant by applying the train mile basis without switching mileage, assigns to freight 52.96 percent and to passenger 47.04. The division arrived at by defendants on what they call their modified train mile basis, i. e., modified by including switching mileage, assigns to freight 65.31 percent and to passenger 34.69.

In reply to this claim of defendants, the complainant claims that if the train mile basis is to be modified by the inclusion of switching mileage, the modification thus proposed by the defendants is defective in three important respects, viz.,

1. That it assumes that all of the 32.2 percent of the elapsed time of freight trains that the evidence shows is spent in stational work is spent in switching operations, although the evidence shows that at least one-third of that time is spent by the trains in standing still, while unloading less than carload freight.

2. That it assumes that switching movements are made at the same rate of speed that is made by trains while running on the road, when, in fact, the switching mileage is computed on a time basis, in which the speed assumed is 6 miles per hour, and the average speed of freight trains running between stations is sixteen miles an hour.

3. That the greater part of the switching done by both road engines and yard engines is done on exclusive freight tracks, which are not common property, but have been allocated to freight, and the expenses of maintenance of which have been assigned as freight expenses.

In dealing with the questions thus raised, it is to be borne in mind that here, as in so many instances elsewhere in a rate case, it is impossible to be accurate, and difficult even to estimate, but that it is nevertheless necessary to approximate the truth as nearly as possible. And it is clear that an estimate of the amount of switching mileage that makes a reasonable allowance for time spent at stations in unloading less than carload freight and also computes the switching mileage on the basis of six miles an hour instead of sixteen miles, will more nearly approximate the truth than an estimate that does neither of these things. And it is equally clear that the mileage basis on which the common property is to be divided should not include mileage that is not made on the common property, but on exclusive freight property, and that, as the switching mileage is mostly made in the freight service a considerable portion of it is made on

exclusive freight tracks. Exactly what portion of it is so made, it is impossible to determine and very difficult to estimate, as all switching operations involve more or less use of the common property from or onto which the cars are switched, and on which the locomotive must do more or less traveling in accomplishing the switching operations. But an estimate which makes a reasonable allowance for mileage on exclusive freight tracks will approximate the truth more nearly than one that does not make such allowance, and should, therefore, be preferred to the latter.

As furnishing such a preferable modification of the straight mile basis, the complainant presents an estimate in which it undertakes to make such reasonable allowances and corrections and by which they arrive at a division of the common property in which, for the year 1913, 57.01 percent is assigned to freight and 42.99 to passenger, and for the average of the four years 57.52 to freight and 42.48 to passenger.

The allowances made in this estimate seem to be reasonable and the estimate thus presented I find to be a fair approximation of the amount of mileage to be included on account of switching operations as part of the train mile basis of division.

I will now explain in detail how the ratios above mentioned are arrived at, using, in illustration, the figures of the year 1913.

The purpose of the modification of the straight revenue train mile basis is to add to the number of revenue passenger and revenue freight train miles, respectively, a proper number of miles to represent the miles made by engines in switching operations in each service. The accounts kept by the complainant in accordance with the accounting rules of the Interstate Commerce Commis-

sion divide switching into two classes, one called road switching and the other yard switching.

Road switching is the switching done by road locomotives at way stations in connection with their business of delivering and receiving freight thereat. Under these accounting rules, this road switching is calculated at six miles per hour for all the time spent by the train at a station above one hour.

Yard switching is the switching done by switching locomotives at the terminals where they are employed, estimated by reckoning the time such engines are in service at six miles per hour.

It is obvious that, under these switching rules, no attempt was made to estimate the actual miles of road switching, because, even if switching were done at a station, it would not be reported except for the excess time above one hour. It becomes necessary, therefore, to estimate the actual road switching.

It appears undisputed from the evidence that of the total elapsed time between terminals of all freight trains (other than trains carrying ore to the Marquette docks) 32.2% is spent at stations doing switching, unloading less than carload freight, waiting for leaving time, or waiting for orders. The exact proportion of this time at stations actually spent in switching operations is not directly shown, and must therefore be estimated, but it appears that for a considerable portion of the time while package freight is being unloaded, or the train is waiting for its leaving time, or for orders, the locomotive is doing no switching, but is idle, and it would seem a very conservative estimate to figure this idle time at 15%, leaving 85% of time during which the locomotive is estimated to be actually engaged in switching operations.

To get the time consumed in road switching, it is necessary to convert this 32.2% stational time into terms of

hours. If we consider the entire road time as 100% and the stational part there of at 32.2%, the running time will be the difference between these two percentages, or 67.8%. This 67.8% of time is consumed in running 804,917 miles, being the total revenue freight train miles less the mileage of ore trains, which do no stational work. As the average speed of these freight trains is sixteen miles per hour, this 804,917 miles represents 50,307 hours running time. The total time, therefore is 74,214 hours. 85% of the stational part thereof is 20, 321 hours and the total number of road switching miles reckoned at six miles per hour is 121,926.

Recapitulation.

Revenue freight train miles	865,096
Deduct ore train miles	60,179
Freight train miles other than ore	804,917

Entire time of freight, other than ore trains	100%
Time at stations of freight other than ore trains	32.2%
Running time of freight, other than ore trains	67.8%

804,917 miles at 16 miles per hour	= 50,307 hrs. running time.
50,307÷67.8×100	= 74,214 hrs. total time.
32.2% of 74,214 hours	= 23,907 hrs. time at station.
85% of 23,907 hours	= 20,321 hrs. switching time at stations.
20,321 hours at 6 miles per hour	= 121,926 mi. switching miles at stations.

From this computation, it appears, therefore, that the number of switching miles at stations is 121,926. But these road switching miles, however, are not all per-

formed on the common tracks, as a great and presumably the greater part of the switching is done on exclusive freight tracks which have been allocated to that service and do not comprise any part of the common property. As there are no exact figures in the record to show the proportion of switching done on the common tracks as compared with that which is done on exclusive freight tracks, it is necessary to estimate that proportion; and I have made such estimate, basing it on the assumption that the same amount of switching is done per mile of common tracks used in switching operations at stations as is done per mile of exclusive freight tracks, an assumption which, although it may appear arbitrary, is a reasonable one and at least fair to the defendants, for the reason that the evidence shows that the greater part of this switching is necessarily done on exclusive freight property.

I have, therefore, on this assumption, computed the proportion of road switching done on the common tracks from the evidence in the case, by taking the total mileage of exclusive freight tracks at all stations on the road (except the five stations where the switching is done by yard engines) and the total mileage of common tracks used in switching operations at such stations, and find that such mileages are in proportion of 59.13% freight and 40.87% of the 121,926 road switching miles was done on common tracks, amounting to 49,811 road switching miles.

The switching miles made in the different yards of St. Ignace, Marquette, Ishpeming and Negaunee (one yard for both places) and Houghton, are shown by the testimony. There are no separate figures given for the switching in the Soo yard, as the switching there is done by one organization which does all the switching for three railroads. I have assumed that complainant has

the same amount of switching there as at St. Ignace, an assumption which is at least fair to the defendants, as complainant's volume of business at St. Ignace is greater.

I have computed, from the evidence, the proportion of the mileage of common tracks in each of said yards to the total mileage in said yards, and proceeding on the same assumption which I made for road switching, that the same amount of switching is done per mile of common tracks used in switching operations as is done per mile of exclusive tracks, I have divided the switching miles made in each of these yards on the track mileage proportion in such yard from which division it appears that of the 347,207 yard switching miles made in 1913, 111,475 miles were made on common tracks. I have divided these yard switching miles between passenger and freight on the proportions of 3.9% passenger and 96.1% freight, these proportions being agreed upon by the parties as representing the relative passenger and freight proportions of yard switching.

The following table, with the above explanation, shows how this modified train mileage ratio is arrived at, using the figures of the year 1913:

Freight revenue train miles (including ore)	865,096
Freight road switching, on common tracks	49,811
Freight proportion yard switching on common track	107,228
Total freight train miles	1,022,135

Per cent of total miles, 57.01.

Passenger revenue train miles	766,394
Passenger proportion yard switching on common tracks	4,247
Total passenger train miles	771,641

Per cent of total miles, 42.99.

The above method of computing switching miles made on common tracks is criticised by defendants on the ground that, at certain stations which they point out, too small an amount of common track has been assumed as being used in switching operations. To see if this criticism is of vital importance, I have caused a re-computation to be made , in which computation I have doubled the mileage of common track as theretofore taken by me at such enumerated stations, and I find that the result would be a change of little more than one-tenth of 1% in the final ratio. I therefore find that the error, if any, is so slight as to be negligble.

I have also worked out a modified train mileage ratio for each of the three other years, the accounts of which are in evidence. To do this, I have taken the freight revenue train miles and the passenger revenue train miles for such years and have added to each the relative switching miles made in each service in 1913 as above found. I have done this for the reason that the year 1913 is the only year for which the figures are in the record for making the computation of switching miles. While this method for the other years is not exact, the margin of error is slight and I believe that such ratios, as so found, are conservative and fair and sufficiently accurate for the purposes in hand. These ratios for the other three years are

1910.	Passenger	41.48%
1911.	Passenger	44.08%
1912.	Passenger	43.52%

I have adopted the average of the ratios of all the four years rather than the ratio of any one year, as representing more stably the use of the common property by the two services. This average ratio is passenger 43.02, which I find to be the proper ratio for the division of the common property, which has not been otherwise divided as hereinbefore explained.

(Note: This average ratio is hereinafter discarded and that of 1913 adopted instead for the reasons set forth in the discussion of Objection 10, infra.)

In the foregoing discussion, I have deemed it unnecessary to refer at all to any of the various other methods that have been from time to time put forward for the division of the common property. All such other methods may be regarded as eliminated from this case by the fact that both the parties accept the movement of revenue trains as the use of the common property that is to be measured in each service, and differ only as to the method of measuring that use, and the only question involved is that of choosing between the two methods proposed.

The foregoing use of the modified revenue train mile ratio suggested by the complainant for the division of certain property used commonly in the passenger and freight service is the subject of defendants' Objection No. 10. The objection has two subdivisions, "(a)" and "(b)", and I consider them in their order.

(a) This objection is that I failed to use for the division of common property the time basis suggested by the defendants in their modified revenue train mile ratio. I do not see any reason for changing my views on these two subjects as expressed in my tentative report.

(b) The general objection is that the modified revenue train mile ratio I have used attributes too great an amount, volume and value of property to the passenger business, and consequently too small an amount, volume and value of property to the freight business.

There are eight subdivisions, as follows:

(1) The allegation is that the modified revenue train mile ratio used by me does not give effect to the time, value or amount of use by the respective services. Insofar as this objection is intended to urge that a time ratio should be used, I have covered in it what I have already said.

Insofar as the objection states that my ratio fails to give effect to the value of the use by the respective services. I think it is in error. The purpose of the ratio is to measure the relative amount of use of common property in the respective services, and in my judgment, when the amount of use is determined, the value of the use is at once determinable. I am unable to see how the value of the use could be determined in any other way, unless the earnings made in the respective services should be used for that purpose, and this the decision in the Minnesota Rate Case forbids.

(2) The claim is that the percentage of the time of freight trains engaged in stational service used in the computation of my ratio is 32.2%, while the testimony shows that the correct percentage is 36%.

In this claim I find that the defendants are correct, although 32.2% is the percentage which they used in constructing their own modified revenue train mile ratio. I have corrected my ratio using 39.01%.

(3) The objection is that in the construction of my ratio, it was assumed that of the stational time, 15% is time during which no engines nor cars are moving on the common tracks. I am convinced that this assump-

tion was fully justified by the testimony, and is a moderate estimate. Nevertheless, I have concluded to modify my ratio by assuming that freight trains engaged in stational service are using the common property during all the stational time.

(4) and (5) In each instance the objection is that in the construction of the ratio, too great a mileage of exclusive freight track and too small a mileage of common track is used. There is also the further objection that there is error in the assumption that the volume of use per track mile is the same for both common and exclusive tracks.

There is no suggestion by defendants as to the extent to which they claim I have failed to include enough common track.

I find from the stenographer's report of their oral argument that they there insisted that the allowance of 528 feet for common track used for switching operations at small stations was too small. I have decided to recompute my ratio so as to double the allowance of common track at these stations.

The exclusive freight track mileage is a mere matter of computation from the evidence, as is the common trackage in yards. I find an error in the computations due to the fact that I included in the list of exclusive freight tracks, certain spur tracks on which the complainant's engines performed no switching movements in 1913, viz., the "Michigamme Mine," "Danaher," "Northern Cooperage," and "Danber" branches.

This change by doubling the allowance of common track at certain stations and deducting those freight tracks, results in a change in the proportion of common and exclusive tracks used in road switching from 40.87% common to 49.7%.

The methods of operating the complainant's railroad

have been very fully shown in the testimony. The location of industrial tracks of all kinds, their length and the manner in which they are used is in the evidence, and the only conclusion I can draw from all this evidence is that my finding of an equal volume of use per mile of the common and exclusive tracks is one in which, if there is error, it is against the interest of the complainant and not against the defendants.

(6). This objection is that in the adoption of my modified revenue train mile ratio, the applicable presumptions of law are reversed and the doubts in favor of the validity of the statute and the rate are resolved against the sufficiency of the rate. Here as elsewhere, I resolved all doubts in favor of the defendants, and I think I have made no unwarranted presumptions. Nevertheless, I have, in view of objections made by defendants, now gone further, and have modified this ratio in two additional particulars favorable to defendants, as hereinbefore explained.

(7) This objection is to my division of property between passenger and freight, and it states that that division, as made, is dependent solely on opinion without adequate supporting data.

This statement must refer either to the principle of dividing on the train mile basis or to my application of that principle, and in either case it is erroneous.

If it refers to the principle of division, it is erroneous, because my finding that the revenue train mile is the proper basis for such division is not based upon opinion evidence, but upon the grounds set forth at length in my previous discussion of that subject.

If it refers to my application of the principle, it is also erroneous, for the ratio I have used is certainly not based solely on opinion evidence. The revenue train mileage in the respective services was shown from actual

records kept by the complainant. A great part of the switching mileage was also shown by such actual records and the remainder of the same could be determined by mathematical calculation from proved facts. So far as the time spent by freight trains at stations was concerned, the testimony showed, and it was undisputed, that such trains were detained at stations for long but varying periods, engaged in switching operations, and the only opinion evidence on that subject was given by employees working on such freight trains as to the extent of the stay of the various classes of freight trains at these intermediate stations. Some gave their judgment from their general knowledge, based on experience, and others on such general knowledge supplemented by actual test observations.

I can, therefore, see no ground for this objection.

(8) The objection here appears to be a repetition in general form of the specific objections hereinbefore considered, and as such it calls for no further discussion.

The result of the changes above determined upon is to make the modified train mileage ratio for the year 1913 41.91% instead of 42.99%.

The corresponding ratios for the other years are: 1910, 40.45; 1911, 42.94; 1912, 42.36; average for the four years, 41.91.

Division of Passenger Property in Michigan Between Intrastate and Interstate.

Having made this division of the common property, I have the entire property of the complainant divided between the passenger and freight departments. It now becomes necessary to divide the passenger property between the intra- and interstate business.

It is agreed between the parties that this division may be made in the proportion which the interstate and intra-

state passenger miles, respectively, bear to the total passenger miles. Using the mileage for the year 1913, the proportion is 65.58% intrastate and 34.42% interstate. Before applying these percentages, I have deducted the passenger proportion of the value of the so-called Soo bridge and assigned it entirely to the interstate business.

Attached hereto marked "Exhibit 1" is a summary of the property values I find with the division of the same between the passenger and freight services, and of the passenger proportion between intrastate and interstate passenger business.

Estimated Return to be Expected on Complainant's Passenger Property Under the Two-Cent Rate.

I have now completed the valuation called for by the first of the three main questions in the case, viz: what is the value of the property employed in the complainant's Michigan intrastate passenger business? — and have thereby found both the total value of the complainant's property in railway use in Michigan in the year 1913 and also the value of the portion thereof then employed in the complainant's Michigan intrastate passenger service.

I now pass to the second of the three main questions, viz: what annual return on this valuation of the passenger property is to be expected under the prescribed rate? —that is to say, what would be the probable net earnings in each year of the complainant's passenger business if the two-cent rate were enforced.

This question calls for a forecast of the future, and as the only means of judging the future is by the experience of the past, we must find, in results of past experience, a reasonable basis for estimating the future. And as there has been no experience on the part of the complainant

under the two-cent rate, the only means of estimating the results of complainant's passenger business to be expected in a future year of operation under the two-cent rate it to take, as a basis of such estimate, the results of their experience in a certain year under the three-cent rate. And as the use of such results as a basis of estimate involves the assumption that those results would be approximately duplicated in the future years, except as they would be affected by the reduction in rates, the results so used should be those of such a year as would be most likely to be so duplicated. The first step, therefore, is to determine the particular year that is to be taken as furnishing such results. Such a year has been characterized by counsel as a "normal year", meaning thereby a year in which neither earnings nor expenses were so much out of the ordinary as to be abnormal. The complainant, in its bill, alleges that the year 1910 was a normal year, but that is neither binding on them nor accepted by defendants. As furnishing the data required for such a basis of estimate, the complainant has given in evidence in full detail the results of the company's operations not only for the year 1910, but also for each of the three years next succeeding,—showing its revenues and expenses and its net income both from its Michigan business and from the business of its entire system. It is upon the data thus furnished that the complainant undertakes to base its estimate of future business under the prescribed rate; and it is from these data that the question of what will constitute a normal or typical year is to be determined. With regard to this question, my judgment is that it is not the business of any particular year, either fiscal or calendar, that will furnish the most reliable basis for estimating future business, but an average of several years, neither of

which is very considerably out of the ordinary, either as regards earnings or expenses.

As regards the income of such typical year, the complainant proposes to take the average of the four years above mentioned, 1910, 1911, 1912, 1913—according to which the gross passenger income for the typical year would be $949,102.56.

To this the defendants object, and claim that the earnings of the year 1913, which amount to $962,324.98, should be used instead of the average of the four years. The difference between these amounts is not great or of vital importance in the case, but it involves an important principle and therefore requires to be considered carefully.

The question raised is that of a choice between assumptions. For the purposes in hand we are obliged to assume that the earnings in any one future year under the old rate will probably be a certain amount, and the question is whether it is more logical and probable that they will be the amount of 1913, or the average amount of that year with the three previous years.

As between these two assumptions, the latter is the more logical. To make the former assumption, it is necessary to assume that the annual earnings will not fluctuate but will either remain the same as in 1913, or exceed that amount. Such an assumption finds no support in past experience. On the contrary, the earnings have in the past always fluctuated, and as we are using past experience as a basis of future expectations, we are bound to presume that the earnings will, in the future, continue to fluctuate instead of remaining the same or invariably increasing.

Assuming, then, that future earnings will fluctuate as past earnings have fluctuated, we must assume also that the average of these fluctuations in future years will be

substantially the same as that average has been in past years.

For these reasons, I have taken as the amount of annual passenger earnings in future years to be the average above mentioned, viz, $949,102.56.

As regards the amount to be taken as the expenses of the typical year, the complainant proposes to take the average of the four years mentioned as shown by the accounts of the company, but with certain modifications, and certain changes in the accounts as kept by the company, necessary to be made in order to show the true expenses. The proposed modifications and changes it is claimed are necessary because if the accounts of expenses for any year are to be used as a basis for judging future expenses, certain facts which are not shown in those accounts as kept must appear or be made to appear, which facts are as follows:

1. The amount of proper depreciation in such year.

2. That the prices paid for material in such year were substantially those which are to be anticipated in the future.

3. That the prices paid for labor in such year were substantially those which are to be anticipated in the future.

4. That the expenses of maintenance of all kinds for such year were substantially those which are to be anticipated in the future—that is, the maintenance expenses must represent only maintenance required in the year under consideration and must not include deferred maintenance which properly should be spread over a period of years.

Under these four heads, respectively, the complainant claims specifically:

1. That proper depreciation on bridges, trestles and

culverts, and all structures of every kind, must be charged in each year before the expenses of that year or the average of the four years can be adopted as a guide.

2. That the scale of wages in 1913 is shown by the evidence as being more likely to prevail in the future than the average scale of wages in 1910, 1911 or 1912.

3. That in general the prices of all material had increased in 1913 and are still increasing, and in particular that the increasing cost of ties is so definitely shown in the evidence that the 1913 price should be adopted rather than that of either of the three other years.

To this proposal for determining the expenses of a typical year, the defendants make numerous objections.

First. As regards depreciation, they claim that no allowance or charge should be made for depreciation in any of the four years, because, as they claim, the depreciation which would naturally occur in that year was overcome by repairs made out of maintenance expenses in that year; or, at all events, that there is nothing in the testimony that shows what, if any, depreciation took place in either year that was not overcome by the maintenance repairs of that year. This objection, if well grounded, presents a serious difficulty.

There can be no question that any depreciation in the property used, not overcome by maintenance, is a proper part of the expense of rendering the service; that in the case of a bridge or other structure, such depreciation is constantly going on to such an extent that in the course of time the structure must be discarded and replaced by a new one.

This constantly accruing depreciation amounts, of course, in the end to the entire value of the structure new; but the amount of depreciation that will have accrued in any particular year cannot be determined; it can only be

estimated by determining the probable period of life of the structure, and spreading the depreciation uniformly over the period on the assumption that the depreciation was at a uniform rate throughout the period. But the amount of this uncared for depreciation actually accruing in any particular year will depend more or less upon the amount of repairs made in that year, so that the uniform depreciation charge may or may not in any particular year correspond to the fact.

The objection here made assumes that depreciation cannot be charged in any year unless it is affirmatively shown that the value of the structure under valuation was actually worth that amount less at the end of the year than it was at the beginning or at least shown that no part of the depreciation for that year or for any previous year was overcome by the maintenance charged for in that year. If this assumption is warranted, I am unable to see how any such depreciation charge can be made in this or in any case because I am unable to see how it would be possible to make such an affirmative showing. It is not possible to thus definitely determine the actual depreciation of any one year and divide it into two parts, one of which is overcome by the maintenance charged for that year, and the other of which is not so overcome; or to determine whether in that year any depreciation suffered in previous years was overcome by the maintenance charged for that year.

If, therefore, the defendants' assumption that such proof is required is warranted, the depreciation in question cannot be allowed. The question is not free from difficulty; but I think the assumption is not warranted—that there is no such interdependence between depreciation and maintenance as is here involved. The deprciation here considered is that inevitable progressive depreciation in the course of which the entire value of the

structure is gradually expended. The life of the structure may be prolonged by repairs and its length may depend to some extent on the amount expended in repairs, but eventually the entire value must be lost; and the amount so lost by depreciation must be spread over the period of life; and the only practicable way of distributing the loss as between the years is by assuming the depreciation to have been uniform and assigning an equal portion to each year.

The amount thus assigned to any one year may be more or it may be less than the actual depreciation of that year; and to this extent the assignment is arbitrary; and is open to the objection made by defendants that under it certain portions of depreciation may in any year be charged for twice—once as depreciation and once as maintenance. This possibility there seems to be no way of guarding against.

It results, therefore, that we are compelled to choose between disallowing depreciation entirely or allowing it notwithstanding this possibility of duplication.

As between those two alternatives, it seems to me that the latter should be preferred for two reasons: first, because it is less likely to work injustice, and second, because it is not the expenses of any particular year that is taken but the average of several years.

It would be less likely to work injustice because the ultimate loss by depreciation is an inescapable fact and an entire disallowance of depreciation is therefore certain to work injustice to the extent of the loss disallowed.

On the other hand, the danger of injustice from the possible duplication of depreciation charges is minimized by taking the average maintenance expenses of several years instead of those of any single year. The chief purpose of taking such average is to counteract the abnormalities that there may be in any particular year. In my

computations I have, however, made no allowance on account of depreciation as an expense charge, for the reason that complainant has not furnished testimony from which I am able to determine with sufficient definiteness a proper amount for such item.

2. Scale of Wages for Typical Year.

To the complainant's proposal to take for the typical year the scale of wages of 1913 instead of the average scale of the four years, the defendants make several objections; one of which is, in effect, that it would involve an abandonment of the four years' average as furnishing the typical year—that if the four years' average is to be taken for any purpose it must be taken for all purposes.

This objection, I think, is well taken. I do not see how we can with any consistency take for the typical year the average experience of four years in respect to some items and the experience of one of the years in respect to other items.

It is true, as complainant claims, that judging from past experience generally, the probabilities are that wages will be more likely to go up than down, but the basis on which we are here undertaking to forecast the future is a definite particular experience, and not an indefinite, general experience; and we cannot shift from one basis to another.

3. Prices of Material for Typical Year.

As regards prices of material, the complainant claims generally that the prices of all material had increased in 1913 and are still increasing; but they make no specific claim in this regard except the claim that the increasing cost of ties is so definitely shown in the evidence that the 1913 price should be adopted for the typical year.

The objection made and allowed to the preceding item

applies equally to this. Both this and the preceding items involve a misconception of the precise nature and function of the typical year in that they assume it to be an estimate made and grounded in opinion, whereas it is the basis of an estimate to be made and is grounded in fact—the facts of the complainant's actual experience. The first claim of complainant in this connection, viz: that relative to depreciation in the typical year, was allowed because the depreciation was a fact, and as such to be taken into account, and this notwithstanding that it had not been charged up on complainant's books, but the two subsequent claims are of entirely different nature. The facts there alleged are, if true, proper to be given consideration in connection with the general question as to what is to be expected in the future in view of past experience, not only in general, but also and especially in view of the particular experience of the typical year.

As bearing on the general question as to what is to be expected in the future, complainant asks me to find, and I do find, from the evidence that since 1910 there has been a substantial increase in the rate of wages paid by complainant in almost all classes of labor employed by it; that a large proportion of this increase came from a raise in wages for trainmen, and that this increase is probably permanent.

Complainant also asks me to find in this connection, and I do find, from the evidence, that since 1910 there has been a steady increase in the prices of railway supplies generally and particularly in the prices of ties.

Complainant further asks me to find, in this connection, and I do find, that it is the rule of law that a public service corporation must be allowed sufficient revenue to pay its operating expenses, to keep *up its property* and to pay a fair return on the investment; that in accordance with this rule, such a corporation is entitled to and should

charge off each year, in addition to its operating expenses, a sufficient sum to take care of the annual depreciation of its property; that the testimony shows that complainant has not, in its accounts, charged depreciation on any of its property except equipment and ore docks; and that to represent a true statement of the financial results of complainant's operations, there should be added to the operating expenses of each year, as shown by the company's books, an additional amount to take care of the depreciation on the remainder of the property on which no depreciation has been charged.

Complainant further asks me to find, in this connection, that it appears from the testimony that if the scale of wages paid in 1913 had been in effect in the preceding three years, if the tie prices paid in 1913 had been in effect in the three preceding years and if in each of the four years a proper charge had been made for annual depreciation on the bridges, trestles and culverts on complainant's road in Michigan, to say nothing of depreciation on buildings and other property, which depreciation I have not attempted to compute, the average Michigan operating expenses of those years would have been increased by $70,159; the average Michigan passenger operating expenses would have been increased by $21,769; and the average Michigan intrastate passenger expenses would have been increased and therefore the average Michigan intrastate passenger net income reduced by $13,346. The statements and computations contained in this request, I regard as matters of argument and as not calling for a specific finding by the Master.

Defendants further claim that in the years 1912 and 1913, the operating expenses of complainant contain charges for expenses which were occasioned in part on account of the rebuilding of bridges, and the substitution for the old structures of better and more permanent

structures, and a general ballasting of large parts of the road in Michigan, the necessity for which was to take care of maintenance which had been deferred in previous years. With reference to the new bridges, if I correctly understand their contention, it is that the accounts were so kept that there were charges made to expenses which should have been included in the account for additions and betterments, with the result that the value of complainant's property was increased out of operating expenses. I cannot find from the evidence that there is any foundation for these claims with reference to the year 1912.

It does appear, however, that the expenses on account of the maintenance of way and structures for the year 1913 were considerably in excess of the expenses on the same account in any of the other three years. Thus, with reference to the item "Bridges, Trestles and Culverts", the expenses in 1913 were $28,645 greater than the average for the three preceding years, and the "Roadway and Track" expenses were $38,909 in excess of the average of these expenses for the three preceding years.

The testimony shows that the accounts of these expenses were kept by complainant in accordance with the rules of accounting prescribed by the Interstate Commerce Commission. Nevertheless, it is my judgment that under those rules, if "the cost of replacing in kind, bridges, trestles or culverts removed or abandoned" were charged to operating expenses at the cost new of such replacement in kind, instead of at their present value, it might result in too much being charged to operating expenses and too little to "Additions and Betterments."

It is also true that there was a reballasting of considerable portions of complainant's line in Michigan during the year 1913, and I cannot escape the conclusion that some of the expense was to take care of deferred mainte-

nance. I conclude therefore that defendants are right in their contention that the expenses for the year 1913 do not represent the expenses of a normal year.

All of these assumed abnormal expenses, the evidence shows, are necessarily reflected in four of the subsidiary accounts under the general account "Maintenance of Way and Structures", to-wit: "Superintendence", "Roadway and Track", "Bridges, Trestles and Culverts", and "Ballast". With reference to the accounts "Superintendence", "Roadway and Track" and "Bridges, Trestles and Culverts", I have assumed that the average of the three preceding years represents a normal year. With reference to "Ballast", I have assumed that the average of the five years, 1908 to 1912, represents a normal year's expenses on this account; and the excess charges on complainant's expenses for the year 1913 beyond these amounts, I have rejected. The amount of these deductions, and also the amounts thereof applicable to the freight and passenger service, respectively, and to the inter and intra service in each department, respectively, are shown as follows:

	Passenger	Freight	Total
Superintendence	$ 4,863	$ 7,782	$12,645
Ballast	9,199	12,750	21,949
Roadway and Track	16,307	22,602	38,909
Bridges, Trestles & Culverts	12,005	16,640	28,645

	Intra.	Inter.
Freight	$16,665	$43,109
Passenger	27,789	14,585

Necessarily, the effect of these adjustments of expenses is to increase the net revenues of the complainant by the amount deducted.

$12,000 Paid to President Fitch on His Retirement.

In the statement of complainant's operations for the year 1913, being complainant's Exhibit 67, Sheet 16, under the heading "Other Deductions", is an item of $12,000 paid to William F. Fitch, who had been the president and general manager of the company for many years, and who retired from the presidency in December, 1911. The evidence as to the precise purpose and reason for this payment is not very clear; but it seems to have been in the nature of a substitute for what would have been allowable to him under a system of pensioning old employes, if the company had had such a system. It belongs to a class of allowances which are frequently made by railroads and other corporations as part of their general expenses, and which it is clearly within the discretion of the corporate directors to make; but whether it is an expenditure which is proper to be charged up in this case is not so clear. It does not appear from the evidence that it or any part of it was a necessary expenditure in the carrying on of the business to which the prescribed rate applies, and in any event it should not all be charged up as part of the expenses of the year 1913, or of any one year. If allowed here at all, it should be spread over a period of years and there is nothing in the evidence from which to determine what that period should be. As the item is in itself somewhat doubtful and is clearly not chargeable in its entirety to the year 1913, I am unable to see how I can allow the item or any specific part of it and have decided to sustain the defendant's objection to it, and to exclude it from my computation.

After making these adjustments of the 1913 expenses and deductions from income, I have taken as the operating expenses and deductions from income of my typical year the average of the passenger operating expenses and deductions from income of the four years, 1910 to

1913, inclusive, for the same reasons which I have given for taking the average of the revenues of said four years to make up the revenues of my typical year.

To these conclusions thus reached by me, counsel for both parties renewed the objections hereinbefore discussed (pages 268-282) and in addition, defendants made new objections, No. 11 and 12, as follows:

> No. 11. "The defendants reserve the right to present an exception that such report is erroneous in its finding and determination that the gross passenger income for the four years 1910-1913, is to be taken and used for testing the validity of the statute, instead of the gross passenger income for 1913."
>
> No. 12. "Exception is made and objection taken to the failure to find and use the average value of the complainant's property in use in its railroad business for the four years (1910-1913) for which the income and expenses are averaged and used."

The Master says (p. 226):

> "If the four year average is to be taken for any purpose, it must be taken for all purposes."

In considering the defendant's objections, my first impression was that these two objections were to be considered together and that when so considered they were to the effect that the average of earnings and expenses for the four years 1910 to 1913 could not be taken as those of the typical year to be used here without taking also the average value of the property employed in those years and this latter could not be taken because we have not found the average value of the property employed in those years, but have found the value of property employed in the year 1913 only, and that therefore it is the earnings and expenses and value of property employed in that year that must be taken as constituting the typical

year. And this understanding of the objections seems to be fully confirmed by the fact that in support of the objections defendants' counsel quoted the finding previously made by me herein that "If the four year average is to be taken for any purpose, it must be taken for all purposes."

With this understanding of them, I found that the objections were well taken for the reason that it is not merely future earnings and expenses that are to be forecast, but also the relation of those earnings and expenses to the value of the property empolyed; and in forecasting this relation we cannot take the earnings and expenses in a certain past year arising from the use of one amount of property as a measure of what earnings and expenses will arise in any future year from the use of a larger or smaller amount of poperty. As it is clear that if any average of earnings and expenses (or of either of them) is to be taken, it must be accompanied by the average value of property employed in the several years entering into that average, and as we have here found only the value of property employed in 1913, the objections seemed to me to require that the year 1913 be taken as the typical year, and as I did not deem it an actual necessity to take any average year, and as both parties appeared willing to take the year 1913 as the typical year provided its expenses were normalized, I sustained these objections, adopted 1913, with expenses normalized, as the typical year, and made all subsequent estimates and calculations accordingly.

Afterwards, defendants' counsel, having been advised by me of my understanding and treatment of these objections, informed me that such was not intended by him to be the effect of the objections, and explained that his intention therein was to object not to the use of the average of expenses for the four years but only to the use of the

average of gross earnings; and that the effect intended to be accomplished by the objections was to require that the typical year be made up by taking the average expenses of the four years and combining them with the earnings and property of the year 1913. It appears, therefore, from this explanation, that the purpose of these objections was, not as supposed by me, to require that the results of 1913 be taken as those of the typical year, but that the earnings and property only of 1913 be so taken, and that for the purposes of a typical year, these latter should be combined with the average expenses of the four years, those of 1913 being first normalized for that purpose.

Insofar as these objections seek to accomplish this purpose, I am unable to see how they can possibly be sustained. It would be in direct conflict with the principle above referred to that if an average year is used for any purpose it must be used for all purposes. That principle has been adopted and strictly adhered to in this report, and has been repeatedly recognized and appealed to by counsel on each side; and it is a principle about which there can be no question. In fact, it is this very principle that is invoked by defendants' counsel in these two objections—the objections being directed against the average year which I had adopted and being made upon the ground that the average of earnings and expenses of the four years cannot be taken without taking also the average of property employed in the same years, which is, of course, a practical application of the principle that if an average is taken for any purpose, it must be taken for all purposes.

I am therefore virtually asked first to sustain these objections on the ground that I erred in finding a typical year by taking an average of earnings and expenses for a number of years and combining them with the property

of a particular year, and, second, having thus corrected this error, to proceed to commit the same error by taking for the typical year an average of expenses for a number of years and combining them with the earnings and property of a particular year and thus involving a glaring inconsistency.

But, aside from this inconsistency, it is perfectly clear that we cannot take separately for the typical year either the earnings, expenses, or property of one year and combine them or it with either the earnings, expenses or property of another year. And it is therefore clear that these objections insofar as they claim that average earnings and expenses of a number of years cannot for the purpose of finding a typical year, be combined with property employed in a single year, must be sustained for the reason already stated, and that for precisely the same reason, it is equally clear that tht objections insofar as they claim that the typical year should be made up by combining the earnings and property of 1913 with the average expenses of the four years must be overruled.

These objections having been thus disposed of, it remains to conider how the typical year already adopted is thereby affected. As already stated, the year 1913, with expenses normalized, was taken by me as the typical year and all estimates and calculations made accordingly, on the understanding that the defendants desired it and the complainants were satisfied with it. It now appears that the defendants do not desire it, but desire instead the composite year combining average expenses of the four years with earnings and property of 1913, so that it comes to a question of choice between such composite year and the year 1913. As between those two, there can be no hesitation in choosing—the one is impossible, while the other is practically unobjectionable, and is, I think, the best that is here available. True, as a general princi-

ple, the average results of a number of years afford a safer criterion by which to forecast future results than do those of any particular year, but they do not always do so, and in this case, their superiority to those of 1913, if anything, would be too slight to be of any consequence. It would be possible, in this case, to use an average of three years as we have the earnings and expenses of 1911, 1912, and 1913, also the property value of 1913, and could probably find from the testimony the property values for 1911 and 1912; but those property values have not been found by me, and in view of the results of those years as found, I can see no good reason for finding and adopting as those of the typical year the average results of those three years, in preference to those of 1913, with expenses normalized.

My conclusion, therefore, upon the questions involved in those objections is that the average results of four years formerly adopted by me as the typical year was erroneous for the reason stated; and that the results of the year 1913, with the expense normalized, are to be taken and used instead as those of the typical year for the reason that under the circumstances they may, without injustice to either party be taken as those most fairly typical of the results that are to be expected in future years.

Results of Complainant's Past Operations in Michigan, 1910—1913.

Complainant has offered in evidence in great detail the results of its operations for each of the four fiscal years, 1910 to 1913, inclusive, showing its revenues and expenses, and its net income, both from its entire system and from its Michigan business.

Except as to a few comparatively small items, there is

no dispute as to the correctness of the figures, but there are substantial differences between the parties as to the proper division of revenues and expenses between the freight and passenger departments, and between intrastate and interstate freight and passenger.

Attached hereto, marked Exhibits 2, 3, 4 and 5, is a statement of the results of complainant's Michigan passenger operations during each of the four years named as I have found them.

The methods used by me in making the various divisions of revenues and expenses and my reasons therefor will be explained.

But before entering upon such explanation, it is desirable to dispose of certain questions raised by the defendants in relation to complainant's revenues and expenses, as follows:

(1)—Sleeping and Dining Cars.

The defendants claim that these two services are "Outside operations", meaning by "outside operations", operations outside of the passenger business to which the prescribed rate applies—and that therefore the operating expenses of these facilities must be excluded from complainant's passenger expenses before the true passenger expenses can be determined.

This claim of the defendants applies equally to both the sleeping cars and the dining cars, but the two kinds of cars involve different considerations, and they will therefore be considered separately.

Sleeping Cars.

With regard to the sleeping cars, the complainant claims that their earnings and expenses should be included as part of the service to which the prescribed rate applies, but would be willing to consent that they be

treated as outside operations and their earnings and expenses properly chargeable to that service be excluded, if it is also understood that the railway fares received from passengers carried in sleeping cars are part of the earnings of the sleeping cars and as such are excluded from consideration as passenger earnings; but it denies that it is possible to ascertain those earnings and expenses, either from the testimony or from their records.

But this concession would not satisfy the defendants. They claim that the sleeping cars and the fares received for berths and seats should be excluded from the passenger revenues, but that the fares received in them for railway transportation should be included as part of the return on the property required for the transportation of passengers, because of the alleged fact that the passengers paying those fares could have found ample accommodation in the day coaches of the train on which they were riding; that the company were under no obligation to carry these passengers in sleeping cars, but so carried them voluntarily and of their own motion; that they thus unnecessarily supplied double accommodations for these passengers, and that the public cannot be required to pay for both accommodations but only for that which was provided in the day coaches; that these passengers would have used and paid for accommodations in the day coaches if the company had not provided those in the sleeper, and that the company cannot thus deprive the public of the right to be credited with these fares by voluntarily providing other accommodations outside and inducing passengers to use them.

The position thus taken by defendants assumes that the Legislature in legislating with reference to sleeping cars has treated the operation of such cars as an operation outside of and not a component part of the business of transporting to which the prescribed rates applies;

also, that in enacting the statute in question, the Legislature intended to deal with and prescribe for the business of transporting passengers in day coaches only and treated it as a business wholly separate and distinct from the business of transporting passengers in sleeping cars. Is such assumption warranted?

Assuming that it would be competent (as it undoubtedly is) for the Legislature to so fix the status of the sleeping car service and also that of the transportation service in day coaches that the former service will be an operation outside of the transportation service to which the prescribed rate applies, is it a fact that the Legislature has done so? Does it appear from the statutes on the two subjects that such was the intention of the Legislature?

These statutes are two in number, i. e., that of 1875, authorizing the operation of sleeping cars and the sale of berths and seats therein, and that of 1911, prescribing the rate in question. The statute of 1875 is as follows, being Sections 5252-3 of the Compiled Laws of 1897:

> Section 1. The People of the State of Michigan enact: It shall be lawful for any railroad company operating any railroad within this state, to construct or use for the transportation of passengers, sleeping cars, parlor cars, or chair cars for the use of such passengers as may desire to use the same, and such company may make such reasonable rules and regulations concerning the use of these as such company may think proper, and may charge a reasonable compensation for such use, in addition to the regular passenger fares allowed by law.
>
> Section 2. Nothing herein contained shall release any such railroad company from its obligations to furnish first-class passenger cars for the use of the

public for the regular passenger fares now fixed by law.

In this statute I am unable to discover any intention to make the operation of sleeping cars an operation distinct from and outside of the business of transporting passengers. On the contrary, it seems to me that the statute clearly evinces an intention to make the operation of sleeping cars a component part of the buiness of transporting passengers—that the permission there given was not a permission to institute and carry on an outside operation for the purpose merely of furnishing sleeping facilities, but was rather a permission to operate sleeping cars in connection with, and as a part of, their passenger trains for the purpose of transporting therein such passengers as might desire to avail themselves of and pay extra for the special accommodations thus furnished in connection with their transportation. The railroads might lawfully have installed and operated such cars without such legislative permission, but probably could not lawfully have refused to permit a passenger to ride in them without the payment of a sum in addition to the regular railway fare then prescribed. To authorize the railroads to require such extra payment as a condition of riding in these cars seems to have been the chief moving cause of this statute. But be that as it may, the statute treats the operation of sleeping cars as a part of the business of transporting passengers, and evinces no intention to regard it as an operation outside of that business.

Turning now to Act 276 of the Public Acts of 1911, the Act complained of in this case, I am in like manner unable to find therein any evidence of an intention on the part of the Legislature to make the sleeping car service an operation outside of the passenger service to which the prescribed rate applies, but find, on the contrary, what seems to me an evident intention to treat the sleep-

ing car service as a component part of the business of transporting passengers.

The statute, or the particular portion of it that concerns us here, is as follows:

"Every such corporation shall possess the general powers and be subject to the liabilities and restrictions following; that is to say: * * *

Ninth: To regulate the time and manner in which passengers and property shall be transported and the tolls and compensation to be paid therefor; but such compensation for transporting any passenger and his or her ordinary baggage, not exceeding in weight 150 pounds, shall not exceed the following prices, viz: for a distance not exceeding five miles, three cents per mile; for all other distances for all companies the gross earnings of whose passenger trains as reported to the Commissioner of Railroads for the year 1906 equaled or exceeded the sum of $1,200 per mile for each mile of road operated by said company, on which regular passenger service is maintained, as hereinafter provided, two cents per mile, and for all companies whose earnings reported as aforesaid were less than $1,200 per mile of road operated by said company, three cents per mile: Provided that in the future, whenever the earnings of any company doing business in this state as reported to the Railroad Commission at the close of any year shall increase so as to equal or exceed the sum of $1,200 per mile of road operated by said company, then in such case said company shall thereafter, upon the notification of the Railroad Commission, be required to only receive as compensation for the transportation of any passenger and his or her ordinary baggage, not exceeding in weight 150 pounds, a rate of only two cents per mile as here-

inbefore provided: * * * Provided further that no company shall charge, demand or receive any greater compensation per mile for transportation of children of the age of twelve years or under than one-half the rate herein prescribed. * * *"

Now, if it had been the intention of the Legisalture in enacting this statute to deal separately and specifically with the business of transporting passengers in day coaches in the ordinary manner, the provisions of the statute would, of course, have been made applicable in terms to that particular business, separately and specifically. Instead of being so made applicable, the provisions are made to apply to the entire business of transporting passengers both in day coaches and in sleeping and chair cars, without distinguishing in any way between the businesses carried on in the different classes or kinds of cars. In either kind of car the transportation charge is to be the same.

Not only so—not only is the entire transportation of passengers treated as one business, but the entire passenger train service also is so treated, even to the extent of making it the basis on which the applicability of the new rate is predicated. In prescribing the conditions under which the new rate shall or shall not be applied, it is the amount of earnings that is made the determining factor and the earnings on which that determination is predicated are not merely the earnings of the day coaches in the passenger trains, but the earnings of the entire train, including the sleeping cars. For the purposes of this case, we are required to presume that the legislature in perscribing the rate and the conditions under which it was to be applied, investigated and determined the conditions under which the rate to be prescribed would yield a fair return on the value of the property employed in producing it, and having deter-

mined those conditions, prescribed them in the statutes. The judgment which we presume that the legislature thus formed is found in the statutes and it is this, that when the gross passenger train earnings amounted to as much as $1,200 per mile of road operated, the two-cent rate will yield a fair return on the value of the property employed. Now does this mean the property employed in earning the $1,200 per mile of road operated, or in earning the two-cent per mile of each passenger carried? Or does it, or can it mean both? It must manifestly mean the former, whether it means also the latter or not. The fact of earning the $1,200 is made the ground for reducing the passenger rate and it certainly could not be made such ground if it did not yield a fair return on all the property employed in earning it. So that if it means also, what is claimed by defendants in effect, that the two-cent rate will yield a fair return on the specific property employed in earning it, and that that property consists entirely of day coaches and a part of the baggage car and the properties assignable thereto, it must be by inference drawn from the former. But no such inference is possible. The fact that $1,200 per mile can be earned by the use of the entire property of the train furnished no ground for any inference as to what return the passenger earnings will pay on that part of the property in the train that is devoted to the transportation of passengers, and there is no indication that the legislature undertook to draw such inference.

The only judgment which the legislature can be found to have pronounced is that when the passenger train earnings reached $1,200 per mile, the passenger earnings under a two-cent rate, together with the other earnings of the train, will yield a fair return on the entire property assignable to the passenger train service. In this judgment the legislature does not undertake to distin-

guish between the passenger transportation service in the day coaches and that in the sleeping cars, but deals with the passenger service in its entirety.

I therefore find that the entire business of transporting passengers, whether in sleeping or other cars, is one business, and that in no proper sense can the sleeping car business be considered an "outside operation".

But from this conclusion, it does not follow that the complainant, under this permissive statute, may transport passengers in sleeping cars in such a manner as to burden its other business with expenses which would not be incurred if passengers were not so transported, and then have these burdensome expenses treated as part of the necessary expenses of its passenger business in determining whether the rate of return allowed under the act herein in controversy allows a fair return upon the property employed in passenger transportation.

The parties to the litigation are in accord on the proposition that the transportation of passengers in sleeping cars must not thus burden the other passenger business. But they are in sharp disagreement as to whether the transportation in sleepers does burden the other business, and as to how the question of whether there is such burden or not shall be determined, and if there is such burden, as to the amount thereof.

The following table shows for the years 1910 to 1913, inclusive, the gross revenue received from the sale of berths and seats, the expenses and the net revenue:

1910	$ 25,803.21	$14,060.06	$11,743.15
1911	26,262.23	14,548.14	11,714.09
1912	26,685.83	17,506.87	9,178.96
1913	30,243.11	17,911.30	12,331.81
	$108,994.38	$64,026.37	$44,968.01
Average	$ 27,248.59	$16,006.59	$11,242.00

In these expenses are included all the expenses directly incurred in operating these cars, such as the salaries and expenses of superintendents who look after the service, the wages of sleeping car conductors and porters, the cost of maintenance depreciation and insurance of the cars, and stationery and printing, but they do not include any of the expenses incident to the transportation of the cars as a part of a train, or incident to the maintenance of the other general passenger property of the company. The value of the sleeping cars assigned to Michigan, owned by the company, I have found to be $65,566.00.

The revenue received by the complainant for the transportation of passengers in the sleeping cars cannot be determined with certainty, for the reason that they have never been separated from the other passenger transportation earnings in the accounts of the complainant.

The complainant contends, however, that the court may take judicial cognizance of the fact that such earnings would be at least three times the amount received from the sale of seats and berths, which would make the average receipts for the transportation of passengers in those cars over $80,000 per year. If it were necessary, I think I would be justified in so deciding.

It is the claim of the complainant that if these earnings are in excess of the extra cost involved in hauling the sleeping cars, then the sleeping car business of the company, that is, the business of transporting passengers in sleeping cars and furnishing them sleeping berths or seats, is carried on at a profit and the other passenger transportation business of the complainant is not burdened, but, on the contrary, helped. By "extra cost" the complainant means any operating expenses other than those of "outside operations" which the complainant could escape if it carried on its passenger transporta-

tion business only in day coaches, and used no sleeping cars.

The defendants, through their witness, Mr. Thompson, an expert accountant, introduced evidence from which the expenses assignable to the operation of the different classes of cars used by the complainant in its passenger train service can, for the years 1912 and 1913, be fairly approximated by the use of formulas prepared by Mr. Thompson, which take into consideration the weight of the different cars and the miles run by them. I shall later more fully explain these several formulas. For my present purpose it suffices to say that by Mr. Thompson's method, it is possible to estimate for the sleeping cars, the extra expense above referred to for each of the years named. In the year 1912, this extra expense was $39,346 and for 1913 $38,968. In estimating this extra expense, there is excluded all of the 60% of the maintenance of way expenses, which are admittedly entirely attributable to deterioration on account of the elements, as hereinbefore explained. Of transportation expenses, there are excluded all of the expenses of superintendence and of dispatching trains; the wages of road enginemen; the expenses of interlockers; engine house expenses, road; the wages of road trainmen; crossing flagmen and gatemen; telephone and telegraph operation; damage to property; damage to live stock; injuries to persons; other expenses; stationary and printing; also there is excluded that portion of fuel, water, lubricants and other supplies for road locomotives which Mr. Thompson's formulas attribute to the weight of the locomotive, and all the expenses which are included under the general account "General Expenses", as none of these expenses could be saved or appreciably reduced if the use of sleeping cars were discontinued.

The result of these estimates leads me to the con-

clusion that so far from being a burden on the passenger business, the operation of these sleepers is a distinct benefit to that service, unless the defendants' contention is sound that I must assume that if the sleepers were not run, the passengers transported therein would be transported in day coaches at much less expense, which subject will be considered later.

The claim of the defendants in regard to the railway fares earned in these sleeping cars is substantially this: they claim, first, that under the statute of 1875, railroads are not required to furnish sleepers or to transport passengers therein; that if the railroads did not transport passengers in sleepers, the passengers who travel therein would travel in day coaches, and that on this particular railroad, the average loading of the day coaches is so small that all the passengers carried in sleepers could and would be carried in the day coaches, and that therefore a pro rata share of all the expenses of carrying on the passenger business of the complainant, except the "Traffic Expenses", must be charged against the sleeping cars. To assign the expenses, they adopt the formulas hereinbefore referred to, prepared by Mr. Thompson.

It therefore becomes necessary to describe these formulas or ratios, and to consider the soundness of the defendants' contention with reference to their application.

Mr. Thompson first assumes that there are five distinct businesses carried on on complainant's trains; the first business is the transportations of passengers in day coaches, including their baggage; then the sleeping car business; then the dining car business; then the mail business; and then the express business.

He determines as between baggage and mail and express, the relative floor space occupied by each in the baggage cars and then assigns on this relation to baggage

and to mail and express a portion of the weight of those cars and their loading. Thereafter, he treats the weight assigned to "Baggage" as part of the weight assignable to passenger service, but the remaining weight of the baggage cars is treated as the only weight assignable to the mail and express. The weight of the "Sleepers and Diners" and their loading is assigned to the business "Sleepers and Diners", the weight of all the passenger cars and their loading, plus the weight previously assigned to baggage, is assigned to the "Passenger and Baggage" business. These respective weights are then multiplied by the total number of miles which each class of cars respectively is transported during the year, and the respective totals show the "gross ton miles" assignable to each business: "Passenger and Baggage", "Mail and Express" and "Sleepers and Diners". From these totals percentages are calculated upon which, as I have said, the bulk of all the passenger expenses are divided.

The bulk of the expenses, not divided on the ton mile ratio, are divided on the car mile ratio, which ratio is derived from the mileage run by the different classes of cars, without reference to their relative weights. There are also minor ratios used for the division of certain expenses, which are relatively small in amount. These ratios, I think need not be here described. Also there are certain expenses which Mr. Tompson divided upon the basis of the results arising from the divisions made by the application of the ratios.

The result of the application of this method of dividing the expenses attributed to the Michigan passenger service as the same have been determined by me would be for 1912.

1912.—Total Michigan Passenger Expenses—$601,696.

Assigned:

		Percent
Passenger and Baggage	$409,000	=57.98
Mail and Express	65,250	=10.84
Sleepers	95,789	=15.92
Diners	31,657	= 5.26
		100.00

1913.—Total Michigan Passenger Expenses—$631,934.

Assigned:

		Percent
Passenger and Baggage	$408,757	=64.68
Mail and Express	69,815	=11.05
Sleepers	92,263	=14.60
Diners	61,099	= 9.67
		100.00

As applicable to the determination of the sleeping and dining car expenses, in accordance with Mr. Thompson's theories, defendants' counsel say in their printed brief:

> "It is claimed that to discontinue this service and take off the cars engaged in it would not reduce the expenses to the extent to which Thompson has apportioned them against it, and that the putting on of the service and cars does not increase the expenses to that extent. This we admit to be true, but that is no argument which complainant can raise against the practice. If it is an argument against the practice of Thompson, it is clearly an argument against similar practices of complainant * * *".

Faulty methods urged by complainant for the division

of expenses it would be my duty to reject; it would not justify me in the adoption of a faulty method in this matter, and the method is in my judgment faulty, so far as it relates to sleeping cars, in these particulars:

It assumes that sleeping cars are provided merely as places in which to sleep and puts them in the same category in which lodging houses would be put if such were provided by the company. It ignors the fact that sleeping cars are primarily and principally instrumentalities for transportation and that their facilities for sleeping are merely instrumentalities for transportation by increasing the comfort with which passengers can be transported. In order, therefore, to determine the expense properly chargeable against these sleeping cars, on account of the facilities which they furnish for sleeping, there must be an apportionment upon some fair basis which distinguishes between the use of the cars for transportation and their use as a facility for making transportation more comfortable.

In my judgement, if the theories of Mr. Thompson and his ratios are to be used for the purpose of determining whether the furnishing of the sleeping facility is a burden, they must be used in such a way that while attributing to the sleeping facility every expense which it adds to the transportation of passengers in ordinary cars, they shall not relieve that business from any expense which it would not escape if sleeping cars were not used. The chief reason urged for the assertion that these sleeping cars burden the other transportation business is that they are heavier than the ordinary coach. This is true, I think, therefore, that a reasonably fair test of the burden, if there be one, caused by the extra weight may be determined by assigning to the passenger transportation business, of the weight of each sleeper, the average weight of one passenger coach used on complain-

ant's road in the trains on which such sleepers are carried, and treating the remaining weight of the sleepers as devoted to the sleeping facility, and then determining the extra expense due to transporting the weight thus assigned to the sleeping facility.

I have caused calculations to be made on this basis, using Mr. Thompson's ratios and methods exactly as he uses them, but applying them to the Michigan passenger expenses as I have determined them, and the result is to show an extra expense due to the sleeping car business for the year 1912 of $9,403, and for the year 1913 of $9,313.

If we compare these expenses with the net revenue from the sale of berths and seats in sleepers heretofore shown, it might be claimed that the sleeping car service of the complainant was a burden on its other passenger transportation business in the year 1912 to the extent of $224 in added expense, and that no return was earned upon the proportion of the value of the sleeping cars which should be assigned to the sleeping car facility.

To determine this value, I have assigned to the business of transportation, such portion of the average value of the sleeping cars as is the equivalent of the average value of the complainant's passenger coaches run in the trains in which complainant's sleepers are carried. This will assign to the sleeping car facility $34,531 of value out of the total of $65,566.

If, however, from the above computations, we should conclude that the running of sleepers is a burden on the other passenger transportation business, it would be because we disregarded entirely the reason for the service, and the incidental benefits accruing therefrom to complainant's passenger business as a whole.

That there is such benefit, the undisputed testimony in this case established beyond possibility of contradiction. Thus the defendants' witness, Mr. Thompson, who testi-

fied that, as a matter of cost accounting, the method for which the defendants contended was the proper method, upon his cross-examination, testified:

Q. How about the sleeping car—if they discontinued the sleeping car, don't you think it would be very bad business?

A. Yes, I think it would.

Q. Don't you think if they discontinued the dining car and sleeping car in this territory, competitive as it is, that it would ruin their business—utterly ruin them and wreck them?

A. You mean as a whole railroad or to do with the intrastate passenger business?

Q. Passenger business as a whole.

A. I take it as to their passenger business as a whole they could not do it.

Q. It would ruin them wouldn't it? Ruin their business?

A. I am not expressing an opinion as to what would ruin them.

Q. You think it would result in heavy loss and it would be unjustified?

A. I think it would be bad business.

Q. Very bad—it would be foolish, wouldn't it?

A. Probably it would.

The evidence shows that a very large part of the public served by complainant's railroad are in centers where there is active competition with other railroads which furnish sleeping car service. This is not only true of interstate business, but it is largely true of intrastate business. Every passenger who travels either inter or intra on complainant's road when otherwise he would travel on some other road, manifestly brings a profit to this road if the amount he pays for transportation exceeds his proportion of the expenses of running the train

on which he rides, because the other charges have to be incurred in any event.

On a road like complainant's, where there are no trains devoted exclusively to the carrying of interstate passengers, but where both inter and intra passengers are carried on the same trains, any inter passenger who travels on this road where otherwise he would travel on some other road, helps to decrease the cost of the transportation of intra passengers to the extent that the fare paid exceeds the passenger's proportion of the actual train expenses of the train on which he rides. These things are axiomatic.

There must also be other benefits accruing from the use of the sleepers. Can it be doubted that many people ride in the day coaches during the daytime, who would not ride therein except that when night arrives, they can get the benefit of a sleeper?

The defendants, however, claim in effect that all the passengers who are carried in the sleepers, would, if the sleepers were not provided, travel in the day coaches, and that the evidence proves that there is ample capacity in the day coaches already provided to take care of this sleeping car traffic. I am unable to see how this claim can be sustained.

The testimony does show that the average number of passengers carried in all coaches, sleepers included, is only 13 per car, but this does not necessarily mean nor does it show, that the day coaches provide very much more seating capacity than is necessary for the business done in them. It is not to be supposed that every seat in every car will be occupied all the time. Provision must be made for the *maximum* number of passengers who will ordinarily be in a car at any time on the run between divisional points, rather than for the *average* number on such run. Such testimony does not show that there is

enough extra space in the day coaches now run to provide for the passengers now carried in sleepers. It does not even tend to show it for the sleepers are run on the principal trains, and the average is obtained from all the trains. We have no data upon the average loading of the trains to which our inquiries are directed, except that it can be gathered from the testimony of Mr. Maney that the loading of the trains hauling sleepers is above the average.

Let us assume that the contention of defendants in this regard is sound. Manifestly their assumption that all of these sleeping car passengers would travel in these day coaches is unwarranted. The most that can be said is that probably some of them would. It must not be forgotten that convenience of travel necessarily stimulates travel. People who would make trips locally on complainant's road if they could do it at night under comfortable conditions, would often not make such trips if it involved either a long day ride or sitting up all night.

In addition to these considerations, it is apparent from the testimony that if the complainant did not run these sleepers not only would a large proportion of the intra passengers who ordinarily travel on complainant's road in its sleepers, take other roads where sleepers are provided, but that it could expect little business from the similar class of inter passengers, if a competing line affording this accomodation could be found, and the evidence shows that there are such competitive roads in practically every direction.

It is doubtless these considerations which led Mr. Thompson to the conclusion which he reached, and to which reference is made above, that it would be a very foolish thing for the complainant to discontinue its sleeping car business.

My conclusion is that it is clearly established from the evidence that so far from the sleeping car business, as conducted by the complainant being a burden on its other passenger business, it is a distinct benefit, not only by reason of the earnings from the sleeping cars, both for the transportation of passengers, and from the sale of seats and berths, but from the fact that if it were discontinued, there would be a loss of revenue so great that the profits in the passenger transportation business would not be so great as they now are.

What is here said of sleeping cars would apply also to parlor cars or chair cars mentioned in the statute of 1875 above quoted. The complainant does not use any exclusive parlor or chair cars, but does run two cars which are called "Dining and Observation cars", part of the space therein being devoted to chair car service and part devoted to dining car service. There are no data in the testimony which show the relative space or weight devoted to the two services.

Mr. Thompson, in his computations, treated these two cars as though they were exclusively devoted to dining car service.

The conclusion that the sleeping car service is not to be treated as an outside operation chargeable with a proportionate share of all costs, according to the theory of defendants, finds strong confirmation in the fact that that theory involves one or the other of two impossible assumptions. It is deducible from the evidence that when the sleeping cars are so treated, their operation results in a heavy annual loss, which in 1913 would have amounted to $115,555.

In so treating the sleeping cars the defendants must assume either that the company will voluntarily incur this annual loss by continuing to operate the cars, or that

the abandonment of the sleeping car service will involve no diminution of passenger earnings.

Either of these assumptions is impossible. Certainly the company would not continue to operate the cars at such a loss; and the evidence is all to the effect that an abandonment of the service would cause a heavy loss in the passenger business. The seriousness of that loss is shown not only by the testimony of complainant's witnesses, but by that of defendants' witness, Mr. Thompson. When he says that it would be foolish for complainant to abandon the sleeping car service, he means necessarily that such abandonment would cause a loss in net passenger earnings of more than the amount of expense thereby saved, which, in 1913, would have been approximately $30,000.

Dining Cars.

The dining car service cannot be credited with any transportation earnings, but only with earnings from the serving of meals. These earnings are not sufficient to pay expenses, but result in a considerable annual deficit, averaging $5,689 for the four years 1910 to 1913, and being $9,337 in 1913. This deficit the defendants claim cannot be charged to the passenger business to which the prescribed rate applies, for the same reason as was urged in connection with the sleeping cars, viz: that the conveniences thereby furnished, although furnished to passengers in transportation, are operations outside of the regular busines of transporting passengers, and must, if carried on, be self-supporting. This claim raises the question whether the providing of means by which passengers in transit may eat in comfort without involving any delay of the trains, is a reasonable provision for a railway company to make in carrying on its passenger business. There is no question that a railroad

may make some provision for the needs and the comfort of its passengers, and that the attendant expense is properly chargeable to the business of transporting passengers, provided such provision and such expenses are reasonable. The question here, therefore, is whether the operation of these dining cars, and their attendant expenses, are reasonable; and as there is no claim that the expenses here charged are exorbitant or otherwise improper, provided the service itself is proper, the sole question here is whether the operation of dining cars is a reasonable provision. It is not denied that the company may, in connection with its passenger business, furnish passengers with accomodations for eating, but it is claimed that such provision is an outside operation, and must be self-supporting—that that portion of the traveling public that does not avail itself of the facility must not be made to pay a part of the expenses of furnishing such facility to those who do avail themselves of it.

On the other hand, the complainant claims that the operation of dining cars, although at an apparent loss, is, in fact, a measure of economy, and on the whole, profitable to the company, because it avoids the necessity of providing eating accommodations at stations with their expense, and avoids also the delay of trains thereby entailed; and there is testimony in the case in support of this claim. That dining cars, as a provision for the needs and comfort of passengers, are superior to eating houses at stations, there is no question and it may well be true that they are also, on the whole, more economical for the railroads, but I find that it is unnecessary to inquire here whether their operation is or is not a measure of economy as claimed. I find that the providing of eating accomodations for passengers is not only a right, but a duty of the railroads: that the form and method of pro-

viding these accommodations are matters to be regulated by them in their discretion, and that the courts, although they will not permit it to be abused, will not review that discretion for the purpose of ascertaining whether it has been profitably or wisely exercised, where, as in this case, no abuse of it is claimed to exist.

If the foregoing finding is erroneous—if it is the duty of the court to review the judgment of the complainant's managers in deciding to operate dining cars as a part of their passenger business and therefore incumbent on the Master to find whether such operation is or is not a reasonable and proper provision made in the course of the carrying on of the passenger business to which the prescribed rate is applicable, I find that the operation of dining cars as carried on by the complainant is a reasonable and proper provision for the needs and comfort of passengers being transported by them in the course of their passenger business, and that the earnings and expenses of the same as set forth in the complainant's testimony and exhibits, are therefore to be treated as part of the earnings and expenses of the passenger business to which the prescribed rate is applicable.

This finding is based on the testimony, not only of the complainant's witnesses, which shows that such dining car service is furnished by all the important and well managed railroads in the country as a component part of their regular passenger business, but also upon the testimony of the defendants' witness, M. W. Thompson, who, although the originator and proponent of the theory that sleeping and dining car operations should be treated as outside operations, and therefore excluded from consideration in testing the fairness of passenger rates, disclaims in his testimony any intention of claiming that the sleeping and dining car service should be abandoned by the complainant and expresses the view that, in his

opinion, such an abandonment would be a foolish thing for them to do.

To my foregoing conclusions on the subject of sleeping and dining cars defendants object (Objection No. 16). The subject of sleeping and dining cars referred to in this objection was fully discussed in connection with my findings on the subject, both upon principle and authority.

With regard to the *Dakota Coal Case*, again cited by the defendants under this objection, I do not find any conflict between it and the conclusions reached by me; and with regard to the *Ann Arbor Case*, also cited, the questions on this subject raised and litigated in this case do not seem to have been raised at all in that case.

Here and elsewhere it seems to me the defendants, in their vigorous contention for the strength and sanctity of the presumption of the validity of legislative action, neglect to give due attention to the chief question that arises in the interpretation and application of every statute, viz: the question of the legislative intention. They assume here that the legislature, in enacting this statute, intended to prescribe a rate of fare which would need to pay merely for bare transportation, without regard to the customary provisions for the comfort or convenience of the passengers transported. It appears from the evidence that if the sleeper and diner services must be treated as outside operations; and, in addition to the extra expense due to their operation, must be charged also with a pro rata portion of the operating expenses that would necessarily be incurred if there were no such operations, the company would be obliged to either furnish these services at a heavy annual loss, or

else abandon them altogether,—which means, of course, that they would be abandoned.

Now are we to presume that the legislature, in enacting this statute, intended to prescribe a rate of fare that would compel such abandonment? I cannot believe that we are,—cannot believe that the legislature intended that the statute should be so applied as to cut off this provision for the convenience and comfort of passengers, or that it had any intentions in this regard, other than to prescribe a rate that would afford a fair return from the passenger service as it was then being rendered including all the then existing provisions for the comfort and conveniences of passengers.

But, even if the legislature did so intend, such intention could make no material difference in the case unless the net passenger earnings, by which the validity of the rate is to be determined, would be greater from the sole operation of the day coaches than they are found to be from their joint operation with the sleeping cars. The defendants' contention that they would be greater rests entirely upon the assumption that the complainants would continue to operate the sleeping cars even though they are held to be outside operations and as such chargeable with a large amount of expenses, which would otherwise have to be borne by the day coaches. It is clear that such assumption cannot be made; but that the contrary must be assumed, viz, that if the sleeping cars are to be treated as outside operations as claimed by defendants, all calculations must be based upon the assumption that day coaches alone will be operated; and it is, therefore, the results to be anticipated from such operations alone that are to be estimated; and such being the case, it follows that the estimate must be based on the results realized from past operations of day coaches alone, and that they cannot be based upon results realized from

their operations jointly with other classes of cars. But we have no basis for such an estimate in this case, as the different classes of cars were operated jointly in each of the four years, for which the results of operations are shown and we cannot, therefore, make a direct estimate of the results to be expected from such sole operations in the future. But the latter can be estimated indirectly by estimating the excess cost of joint operations and deducting it from the total cost of joint operations. This excess cost has already been estimated herein from which the conclusion is reached that the sleeping cars do not burden the passenger service, i. e., that the revenue from the sale of berths and seats is sufficient to cover the excess cost of their operation. If that conclusion is correct, the net earnings from the sole operation of day coaches would be no greater than from their joint operation with sleeping cars. And this even though the volume of passenger traffic remained the same, which the only witness on the subject estimates would be reduced by fifty percent of that now carried by the sleeping cars.

(2)—*Mail and Express.*

The next question raised by defendants in this connection relates to Mail and Express business. Their claim is that these also are "outside operations" and that therefore the revenue and expense of these services should be excluded in determining the effect of the rate in controversy here.

The complainant throughout the trial, until the oral argument, treated these services as part of the passenger business; but in the oral argument was inclined to regard them as outside operations, on the ground that a prescribed passenger rate of fare otherwise reasonable could not be rendered unreasonable by a loss in the car-

rying of mail and express, and conversely, that a passenger rate otherwise unreasonable could not be made reasonable by a profit derived from mail and express operations.

The first of these two propositions is entirely clear—certainly the company could not render unreasonable a passenger rate that was otherwise reasonable by carrying on other operations at a loss; but the second or converse proposition is not quite so obvious. A rate which would be unreasonably low for the transportation of passengers in trains operated exclusively for passenger traffic, might not be so for such transportation in mixed trains earning additional revenue from other transportation; and it would seem that the legislature, in fixing the rate in question, took such additional revenue into account. By the terms of the statute itself, the question as to when the 2¢ rate shall and when it shall not apply is made to depend not upon the amount of passenger earnings, but upon the amount of passenger train earnings, which would, of course, include any other earnings that there might be from other transportation effected by the train; and if this was allowable, the question of reasonableness would be not whether the passenger earnings proper would suffice to pay a fair return upon the value of the property employed for the passenger business exclusively, but whether the entire earnings from the train would suffice to pay a fair return on the value of the entire property employed in the operation of the train. If, therefore, the legislature has power to make one branch of the service pay the expenses of another branch, and if the present proceedings were one to test the reasonableness of the rate as part of the train revenue, it would seem that the mail and express business could not be treated as outside operations but must be included.

But this is not such a case, and according to recent decisions, the legislature has not such power. The question here is not whether the rate in question will, when taken in connection with the revenue from other property, yield a fair return on the value of all the property employed in earning the several revenues, but whether it will, in and of itself, yield a fair return on the value of the property employed wholly in the service to which the rate applies. It is a case of alleged confiscation, and, as such, the sole question is whether the rate complained of will yield a fair return upon the value of the property required to be used in the particular service to which the rate applies. As such is the issue here, and as the mail and express businesses are clearly no part of the passenger business proper, those businesses should be excluded from consideration, notwithstanding their apparent inclusion by the legislature in prescribing the rate.

It follows that to the mail and express business must be assigned its proper proportionate share of the expenses which I have assigned to the complainant's passenger business. This I have done by applying Mr. Thompson's ratios hereinbefore described exactly as he applied them to his own estimate of the same expenses.

Mr. Thompson prepared no ratios applicable to the expenses of 1910 or 1911. But as the percentage of the total passenger operating expenses attributable to mail and express for 1912 and 1913 are practically the same in each year, viz, 10.8 in 1912 and 11.05 in 1913, I think in determining expenses attributable to mail and express in 1910 and 1911 I may use the average of the two years, viz, 10.92, and I have done so.

In view of our general knowledge that the United States mails are in very great part handled on trains by servants of the government, known as mail clerks, and

of the fact shown by the evidence that the express business is done by the Western Express Company, the railroad company only doing the necessary carrying, it may be doubted whether a proportionate part of the general expenses which include the salaries of all general officers and their clerks should be thus assigned to complainant's mail and express business. For the same reasons, it is doubtful whether a proportionate part of the wages of the conductors and brakemen of passenger trains should be charged against the mail and express business.

If, however, a part of these expenses should be charged to mail and express, and a part should not, I have no data in the testimony by which I could make an apportionment of the amount which should be so charged and am therefore compelled to use the methods above described.

If a proportionate part of the expenses of operating complainant's passenger trains is to be charged against the mail and express, it would seem to follow that a proportionate part of the property, which I have assigned to the passenger business must also be apportioned to mail and express. Such an apportionment should be on the basis of relative use of the property. In view of the fact that all of the property affected is common—that is, common to the business carried on on complainant's passenger trains, it would seem that there is no absolutely accurate method of making such a division. Mr. Thompson's ratios for dividing expenses are, so far as is practicable, based on relative use, and it therefore seems to me that a fair division of property may be made on the relation of the total assignments of expenses arrived at as hereinbefore under this heading stated, which will assign 11.05% of the value of the passenger property as determined by me to mail and express. I have used this

method but before applying the percentage, I have deducted from the value of the passenger property the proportion of the value of the baggage cars as I have found them, which Mr. Thompson's testimony shows is devoted to the mail and express business. The assignment to mail and express for these cars is $25,090, and my total assignments of property to mail and express are $462,292.

I have apportioned taxes to the mail and express property on the relation of its value to the value of the entire passenger property.

The revenues received by complainant on account of its mail and express business are assigned to that business.

The results of the use of all the foregoing methods are shown in Exhibit 7 to this report.

If the foregoing conclusions are sustained, no division of mail and express property, revenue or expenses, between the intra- and interstate services is necessary. But such division has been made elsewhere in this report, and there I have decided every question raised by the parties with reference to such divisions between intra and inter, and in my exhibits I have treated all the property apportioned to the passenger service as passenger property, so that whether it shall finally be determined that mail and express are to be included as part of complainant's passenger business, or are to be excluded therefrom, every necessary division can be made.

Division of Revenues.

Except as to a few comparatively small items, there is no dispute between the parties as to the amount of the revenues of the complainant in their Michigan passenger business. Those items are as follows:

1. The defendants claim that certain passenger earn-

ings of the Mackinac Transportation Company should be included in complainant's passenger earnings. This question has already been fully considered in connection with the question whether the property of this transportation company should be included in complainant's inventory. It was there found that none of the property of the Mackinac Transportation Company is employed in the passenger service to which the rate applies, and that none of its property should be included in the inventory of passenger property; but that its property was employed in the joint freight service of the complainant and the two connecting companies, and that one-third thereof should be included in complainant's inventory and all allocated to freight. That finding covers the question here raised and requires that the passenger earnings of the transportation company be excluded from those of the complainant company.

2. The complainant receives certain dividends from the South Shore Land Company, Ltd., a company the capital stock of which the complainant owns, and the defendants claim that these dividends should be included in complainant's revenue.

Neither the stock of this land company, nor the property which it represents is included in the valuation of complainant's property, nor has its business any connection with the operation of the railroad. I therefore can see no reason for including these dividends or any part of them as part of complainant's passenger earnings.

The grounds on which the defendants claim that they should be included is that the business of the land company in whole or in part is attended to by persons who are officers or employes of the complainant company, and who thus give to the land company time and labor

which belongs to and is paid for by the complainant company.

I find it to be a fact that some of the business of the land company is attended to by the treasurer of the complainant company; and that insofar, if at all, as the land company thus receives the benefit of services that are paid for out of the expense accounts of the complainant company, those accounts are erroneous and should be corrected, but that such error furnishes no ground for crediting the passenger earnings of the railway company with the dividends of the land company. The complainant claims that the passenger expenses of the complainant company have not been increased at all by reason of the services rendered by any of its employes to the business of the South Shore Land Company; that the services thus rendered were slight and of a routine character, and involved no interference with the performance of the employes' duties to the complainant company. I am unable to find from the evidence that the complainant's expenses have been increased in any amount by reason of the above mentioned services, or that there has been any neglect of duty to the complainant company by reason of those services; and am satisfied that the rendition of the services in question is not of enough importance to have any material bearing on the merits of this case.

3. There is a slight difference between the parties as to the amount of mail revenue, amounting to $200 and accruing in the accounts for the year 1913. I am unable to find how this difference arises. The figures which I have allowed include all the revenue which I can find from the evidence the complainant actually received in that year. If there is an error of $200, the error should, of course, be corrected.

4. There were certain rents received by complainant

from buildings not in railroad use, which the defendants claim should be included in the complainant's statement of revenue.

The property from which these rents are derived not being in railroad use and therefore not being included in the valuation of complainant's property in this case, it is difficult to see how the rents in question could properly be included in any statement from which the complainant's net passenger earnings is to be computed. The reason given by the defendants for this claim is similar to that given relative to the dividends from the South Shore Land Company, and what was there said by me with reference to that claim is also applicable here.

The grounds of the claim as specifically stated by defendants is as follows:

> "The deductions as made by complainant from income, are, however, too great, as the entire gross income from rentals is deducted with no crediting to the deduction of taxes, expense of rent collections, drawing leases, supervision of the property, repairs and renewals, and other like items, which in aggregate, are probably sufficient to fully offset the income. Unless these things can be separated, the income must be left in in entirety."

I can see no propriety in including as income in this case rents received from property that is not in railroad use and not included in the valuation of property in this case. If the expense account submitted here included any expenses incurred in carrying or caring for such property, the expense account is erroneous, and should, to that extent, be corrected. I am unable to determine from the evidence whether there is such error in the expense account, but am satisfied that if there is any such error, it is too small to have any appreciable effect in this case.

5. Under the heading "Miscellaneous Rents" the defendants specify certain rents received for rails and other property loaned by the complainant to industries along their line, and claim that those rents also should be included in complainant's statement of income.

This claim is similar in all respects to that last preceding. The property from which these rents are received is not included in my valuation of complainant's property nor is it used by complainant in their railroad business; and for the same reasons as stated in connection with preceding similar claims, I find that these rents should not be included in complainant's income in this case.

6. In the revenues for 1913, under the heading "Outside Operations—Net", the defndants claim these earnings to be $$8,066.69, while the complainant's statement shows them to be only $725.32. The revenues referred to are those received from the sleeping and dinnig car service only; that is, the revenue from sale of seats and berths in the sleeping cars, and from meals, etc., served in the dining cars.

In determining these revenues, complainant assigned to Michigan the revenues of all dining cars operating exclusively in Michigan, there being no car operated jointly in Michigan and any other state. The expense of the dining cars in Michigan were determined by dividing all expenses of all the dining cars on the system on the relation of the miles made by the cars in Michigan as compared with the miles made in other states.

The earnings received from passengers for occupying sleepers wholly between points in Michigan were assigned to that state, as well as its proportion of the revenues derived from passengers for occupying sleepers within two or more states determined by the miles of occupancy in each state respectively. Of the expenses

of all the sleeping cars on the system there was assigned to Michigan its proportion based on the number of miles made by those cars in all states.

By the method adopted by the defendants, the revenues from both sleepers and diners were first separately assigned to states on the basis of the revenues received from passengers in each state, and the expenses were separately assigned to states on the basis of the car mileage in each state for each class of service.

It is my judgment that the method adopted by the complainant is the more correct one, and I have adopted it.

To the above finding "6" defendants make objection. (Objection No. 17 (b). The objection is:

> "If the sleeper and diner operations are permitted to remain as part of the passenger operations of complainant in determining the sufficiency of the two-cent statutory rate, then the earnings of such operations, claimed by the defendants to be $8,066.69, or at least $3,989 thereof, should be included in the Michigan earnings, instead of the earnings of $725.32 claimed by complainant and included by the Master."

The objection here is that the net earnings from the sleeper and diner operations of the complainant in Michigan should be $8,066.69, or at least $3,989 thereof, instead of $725.32, as I have found them to be. This objection applies to the earnings for the year 1913, and to the extent that it is sound as to that year, it will require an adjustment of these earnings in the other three years.

The argument is that in my tentative report at page 263, I say that the complainant "assigned to Michigan the revenues of all dining cars operating exclusively in Michigan." It is claimed that there is no proof of such

an assignment, and that in the absence of such proof, these revenues should be divided in proportion to the revenues received from the transportation of passengers in the respective states.

The method of division thus suggested would certainly not be a proper method if division was necessary, but no division is necessary, as the evidence clearly shows that the dining cars operated in Michigan are operated in no other state, so there is no question of the assignment of their revenues between states, and therefore no reason for any division. It would appear that my use of the word "assignment" was inaccurate.

It is stated under this objection that the expenses of both sleepers and diners were divided between states by complainant on the basis of the mileage of all cars of the class including the sleepers and diners of other companies. Defendants are mistaken. The division was made only on the mileage of complainant's cars, but a portion of that mileage was not made on complainant's road, as it included mileage made on the Mineral Range Road. This inclusion was necessary in order to make the proper division between states, as it appears from the testimony that some of complainant's sleepers and diners operate on the Mineral Range Railroad between Houghton and Calumet, and that the complainant receives all the revenues and pays all the expenses of such operation.

Defendants contend that the assignment of expenses of the diners between states should be made on the relation of their earnings in the respective states, and not on a car mileage basis. They point out that the result of the car mileage basis is to assign to Michigan a greater proportion of expense than of revenue, and claim that this ought not to be. I agree with them, and shall divide those expenses by assigning to the Michigan business the

same proportion of the expenses as its revenues bear to the total revenues from dining cars.

7. In the same year the defendants show a credit to the amount of $1,658.47, on account of "hire of equipment". There is no real dispute between the parties on this item, because the defendants offset it by a debit item which makes it agree with the figures of the complainant which I have adopted.

8. There are certain revenues received by the complainant amounting to less than 1% of its total revenues in Michigan, which are not directly assignable to either the passenger or the freight service. I have divided these items between the freight and passenger service on the relation which the totals of the items which can be allocated in each service respectively bear to the total allocated revenue. I do not understand that there is any disagreement between the parties that this is a proper method. The defendants arrive at a different results by using a different percentage, but it is a percentage for which I can find no explanation in the briefs or basis in the testimony, and I therefore leave the matter as it stands, subject to correction, if found erroneous.

Division of Michigan Passenger Revenues Between Intra- and Interstate.

It now becomes necessary to divide the Michigan revenue between the intra- and interstate business. The fares received from passengers, which constitute the great bulk of these revenues, have been allocated between these services. Some other revenue has been so allocated, as is indicated by the use of the word "actual" in the statements, Exhibits 2, 3, 4 and 5.

The revenues which could not be allocated have been apportioned by me on the basis of the allocated revenue

from passenger fares. Although this method is somewhat arbitrary, I think that it is a fair method, and I am of opinion from the testimony that it does not err by assigning too little to the intra.

There is no disagreement with reference to items which I have thus divided, except as to the items Mail and Express, and "Outside Operations" (Sleepers and Diners).

It is the contention of defendants that mail and express carried on trains which run exclusively in Michigan must be regarded as wholly intrastate business, regardless of the connections of such trains with interstate trains of the complainant and of others. I am not able to concur in this view. The evidence shows that every train on the complainant's road running exclusively in Michigan which carries mail and express connects with an interstate mail and express train of complainant or of some connecting carrier, and most trains carrying mail and express have several such train connections.

In view of the railroad geography of the Upper Peninsula, and the fact that the interstate freight business of the complainant is vastly larger than the intrastate freight business, it is not believable that the bulk of the mail and express business on complainant's railroad is not inter rather than intra business, but my finding gives the greater portion of the mail and express revenues to the intra business in order that any doubt that there may be on the subject may be resolved in favor of the defendants.

With reference to the express business the defendants make practically the same contention, and for the same reasons as those last above given, I find the contention not sustainable.

I am not able to determine, either from the oral argument of the defendants or from their briefs, in what man-

ner they have divided the revenues from sleepers and diners between Michigan intra and interstate passenger. My assignment gives to the intrastate practically two-thirds of the entire net revenue from the sleepers and diners. The evidence shows that the sleeping car business was carried on at a profit and the dining car business at a loss in each of the four years. The evidence discloses just where these sleepers and diners run, and from that evidence it appears that if the accounts could be allocated, it would be shown that the revenues derived from the interstate traffic were greater than the revenues derived from intra. It has been the contention of the defendants throughout this case that the sleeping cars were run chiefly for interstate business and were a burden upon the intrastate business, and I am unable to see how their method of division which assigns more of the revenue of this business to the intra service than to the inter can be harmonized with that contention.

Income Due to Unearned Increment.

Under this heading, the defendants ask me to find as follows:

"If the cost of reproduction or replacement value is as claimed by the complainant to be taken as the value of its property, then the unearned increment or the increase in value of its property from year to year must be proven by it and taken as income and added to the revenues of the particular year in question."

And in their printed brief (page 238) they say: "We must insist that no claim of confiscation can be made out without this factor being proven and that the burden of such proof is on the complainant as it must clearly show confiscation to exist before it will be relieved from putting the rates into operation."

This claim, if allowed, would, of course, like the others

which call for similar proof, put an end to the case, as the complainant has not made such proof and indeed, in the nature of things, cannot do so. But the claim cannot be allowed. It could not be allowed without not only coming into conflict with the Minnesota rate decision, but also striking at the very foundation of all private property. In that decision the right of the company to profit by the increase of property values was fully recognized and it requires but a moment's reflection to see that this right which is here and frequently elsewhere referred to by the name given it by the distinguished writer of imaginative economics, Henry George, is the most vital and fundamental of all property rights. To treat it as income would be both wrong in principle and impossible in practice. To do the former would be to deny it in part, and to do the latter would require a finding that at the beginning of every year involved the property under consideration was of a certain value and at the end of every such year it was of a certain greater value. This would be manifestly impossible in practice and if it could be and were done, it should, of course, carry with it as a corollary the converse principle, viz: that wherever the end of a year showed a decrease instead of an increase in value, the income instead of being augmented by an "unearned increment", should be diminished by an undeserved decrement.

I am unable to see how the theory of unearned increment can be reconciled with established principles or practically applied in a rate case.

Division of Operating Expenses.

Division of Operating Expenses Between States.

It now becomes necessary to determine the amount of the operating expenses of the complainant's passenger business in Michigan. To do this it is necessary to

divide the entire operating expenses between states. This presents very little difficulty as the parties are agreed in their figures. The method adopted for the division and its results are shown in Exhibit 6 hereto attached.

Having made this division, we have the entire operating expenses of the complainant in Michigan, and those expenses must be divided, first between passenger and freight, and then the passenger proportion between intrastate and interstate.

Division of Operating Expenses Between Passenger and Freight.

On the average of the four years' accounts under consideration in this case, at least 66½% of the total operating expenses as between the freight and passenger services have been actually allocated or definitely assigned upon bases accepted by both parties. Very much more than half of the expenses which cannot thus be allocated or assigned consist of the expenses of maintenance of way and structures.

Of these, certain items have been divided upon bases agreed upon by the parties as suitable.

Of the expenses of maintenance of way and structures, the great bulk are attributable to property used in common by the freight and passenger departments. A considerable amount of these expenses is attributable to exclusive freight property, and an inconsiderable amount to exclusive passenger property. The records and accounts of the complainant were not so kept that the expenses attributable to these exclusively used properties, respectively, could be separated. After the decision in the Minnesota rate cases, it became abundantly clear that some separation must be made, and testimony was introduced by which such separation could be made

upon fairly satisfactory bases. The exclusive freight property referred to consisted of some branch lines used wholly for freight service, of industrial and mine spurs, and of main and branch line side-tracks. The property used exclusively by the passenger department consisted of a comparatively few side-tracks.

The mileage of main line, of branches, of industrial and mine spurs, and of side-tracks on complainant's road, are all shown in the evidence, and all tracks have been allocated either to freight, to passenger, or to common freight and passenger. It was established by the evidence in the case that the annual cost of maintenance of industrial spurs on complainant's road is not to exceed $300 per mile, and the cost of maintenance of mine branches is not to exceed $375 per mile. It was also established by the evidence that on complainant's road the cost of maintenance of side-tracks is not more than one-third of the cost of maintenance of main line tracks. Therefore, to obtain the cost of maintenance of exclusive freight and passenger tracks in each year, the following method was used: The cost of maintenance of the industrial spurs and mine branches was first ascertained by multiplying the mileage of industrial spurs by $300 and the mileage of mine branches by $375. The result was deducted from the total annual maintenance of way and structures expenses, and the remainder then represented the cost of maintenance of main line and of side-tracks. To ascertain the cost per mile of maintenance of main line and side-tracks, the side-track mileage was equated by treating three miles of side-tracks as equivalent to one mile of main line track. Therefore, to the main line mileage was added one-third of the total side-track mileage, and the result, divided into the total expenses of maintenance of main line and side-tracks, showed the cost of maintenance per mile of the main line, and of the

side-tracks as equated. The total freight main line mileage was then multiplied by the main line cost per mile as above ascertained, and one-third of the total freight side-track mileage was multiplied by such main line cost per mile, the result being to attribute to the freight service its proper proportion of cost of maintenance of exclusive freight main line and side-tracks. A similar computation was made to ascertain the cost of maintenance of exclusive passenger side-tracks. The detail of the calculations by which the results were obtained for each year is shown in Note 15 to my Exhibit 6.

To my findings in this regard defendants direct their Objection No. 7. It consists of four subdivisions, "(a)", "(b)", "(c)" and "(d)". I treat them in order.

(a). The objection is that I have assigned too small an amount of maintenance charges to exclusive freight trackage. The claim is that I have failed to apportion to freight expenses the maintenance expenses of 13.06 miles of exclusive freight trackage which in my valuations I allocated to freight service.

I find that this object is well taken in the following particulars. The maintenance of expenses of the Bessemer Branch, 2.23 miles, and the south 2 miles of the Republic Branch, should clearly be apportioned to exclusive freight trackage; but whether the expenses of the 8.83 miles of the so-called South Line between Eagle Mills and Winthrop Junction, which constitutes the remainder of the track in controversy, should be so apportioned, is not so clear. The complainant claims that this 8.83 miles should be treated as common track, upon the ground that it is maintained for passenger use, and occasionally used for detouring passenger trains. This con-

tention is based on the testimony of Mr. Lytle, general superintendent of complainant, who testified that eight and a fraction miles of the said South Line was so maintained and used.

To this contention defendants reply that the evidence showed that east of Negaunee this South Line is not and cannot be used for passenger service. Upon an examination of the testimony, I find that Mr. Lytle was in error, and could not have meant to refer to the entire 8.83 miles but only to 4.23 miles between Negaunee and Winthrop Junction. With reference to the 4.6 miles east of Negaunee, the evidence is conclusive that it is not used for main line service at all, but is a main branch serving the Queen and Negaunee Mines. (Testimony of Mr. Riggs, Record 4202.)

I find that the testimony fails to show sufficient use of any part of this South Line for passenger service to entitle it to be treated as common track, and that the defendants are right in their claim that the expenses of its maintenance should be assigned to freight.

I find, however, that the defendants' contention that in assigning the expense of maintenance of these tracks, all of the 8.83 miles of the South Line should be classified as main line track, is in error. The uncontradicted testimony of Mr. Riggs just referred to establishes that the 4.6 miles of the South Line that lies east of Negaunee is used exclusively as a mine branch. I have therefore corrected my assignments of the maintenance expenses of exclusive freight tracks as above indicated, classifying 8.46 miles as main line freight trackage, and 4.6 miles as mine branch trackage.

In correcting this error, I discovered that in my original computation, the mileage of the Bessemer Branch was included as part of the main line, and also

as part of the industrial freight spurs. In making my new computation I have corrected this latter error.

(b). The objection is that there is error in the assumption that the cost of maintenance of exclusive freight side-tracks is only one-third of the cost of the maintenance of main line trackage.

Defendants insist that the ratio to be used should be not more than 2½ to 1, and they refer to the testimony of Mr. Riggs, Young, Lytle and Lindsay as testifying to the propriety of using the 2½ to 1 ratio.

In using this ratio I believed that I was acting upon undisputed evidence in the case for the reason that Mr. Delf, the auditor of the complainant, used this ratio, and Mr. Thompson, who was employed by the defendants to determine expenses of operation, also used it. Defendants now claim that Mr. Thompson used this ratio in reliance upon Mr. Delf's testimony.

I have examined all of the testimony to which defendants have referred me on this subject, besides much other testimony. The only direct testimony on the subject of the cost of this maintenance on complainant's road was from Mr. Delf. And this testimony is substantially confirmed by the fact that Mr. Thompson uses the same ratio. With regard to defendants' claim that in using this ratio Mr. Thompson relied entirely upon the judgment of Mr. Delf, I do not find such claim borne out by the evidence. On the contrary, the evidence indicates to my mind that he either relied upon his own judgment or upon the judgment of Mr. Hone, an engineer whom he employed as his assistant.

I can find nothing in the testimony of Mr. Riggs, Mr. Young, Mr. Lytle or Mr. Lindsay that seems to me to justify defendants' claim that I should use any other than the 3 to 1 ratio in this case. On the contrary, insofar as the testimony of either of these witnesses has any

bearing on the subject as regards this road, its tendency is to support the 3 to 1 ratio for use on this road. Mr. Young was questioned as to the cost of maintenance both of main track and side-tracks on the Lake Superior & Ishpeming Railway and the relative cost of the maintenance on that road would appear to have been about 2½ to 1, but the average of side-track maintenance on that road on the four principal sections named by Mr. Young was $225 in 1913, and $209 in 1912, whereas the 3 to 1 ratio attributed to the side-track mileage of the complainant, a cost of more than $310 per mile in 1912 and more than $326 per mile in 1913. The testimony of Mr. Young to which I refer will be found Record 8264-8270.

(c) The specific objections are that of the expense of maintenance of equipment, a part of the "Work Equipment Repairs", "Work Equipment Renewals" and "Work Equipment Depreciation" should be assigned to exclusive freight trackage; and that of the "Transportation Expenses", a part of "Superintendence", "Dispatching Trains", and "Stationery and Printing" should be likewise assigned.

With reference to "Work Equipment" expenses, I think the objection is well taken. For the year 1913 my apportionment of the Maintenance of Way and Structures expenses to exclusive freight tarcks was 12.25% thereof and, I am now assigning to the freight service the same percentage of these "Work Equipment" expenses.

The accounts "Superintendence" and "Stationery and Printing" under "Transportation Expenses" I assigned upon the overhead basis, and by this method the freight service was given the full benefit of those assignments. I can see no reason to make any change in my assignments of these accounts.

Upon further consideration, I think I was in

error in adopting complainant's method of dividing the expense of "Dispatching Trains", and that some other method should be used. As this expense is incurred in directing train and engine movements not only on common tracks, but also on exclusive tracks, I think that a train mileage ratio should be used for this dvision which takes into consideration these movements on exclusive tracks. Therefore for the division of this account I have prepared a new ratio, made up in the same way in which my modified train mile ratio was computed, except that I included all switching miles wherever made, instead of including only those switching miles made on common tracks. This ratio for 1913 assigns to the passenger expense 35.9% of this account. I have used this same ratio for the division of accounts, 63, 78, 94, 101, 104 and 105 under "Transportation Expenses" as shown in note ten to my Exhibit 6.

(a). The objection is that no account was taken of the undisputed testimony that freight spurs and sidings are entirely changed in position, and must be removed and rebuilt at least once in each fifteen years. I assume that it was the intention of the defendants to insist that this claimed undisputed testimony should have been considered by me in connection with the assignment of expense to exclusive freight tracks, although it is not so expressly stated.

I do not find in teh record the testimony referred to and cannot believe that there is any such testimony. I remember testimony to the effect that the average life of freight spurs and sidings was about fifteen years. However, the point is immaterial, as it appears from the testimony of Mr. Delf (Record pages 7752-53) that when a new freight spur is put in, the cost is charged to Additions and Betterments, and that when an old spur is taken up, the cost of taking it up is charged to Profit and

Loss. Mr. Delf's statement in this regard, and that such charges are proper, is confirmed by the rules of accounting of the Interstate Commerce Commission, complainant's Exhibit 27. I cannot see, therefore, that operating expenses are affected when a sidetrack loses its usefulness.

As to the proper division of the remaining common expenses, there has, perhaps, been more controversy between the parties than on any other question in the case. It is agreed between the parties that at least 60% of them is attributable to depreciation of the property from weather and other natural causes as against 40% attributable to the wear and tear caused by traffic.

It is obvious then, and not disputed, that a method which will determine the relative use of the property between the two services will fairly divide this 60%, and as I have already found such method in the modified train mileage basis, I have divided these expenses on that basis.

With reference to the remaining 40%, it is claimed by defendants that the larger proportion is occasioned by the freight service by reason of the heavier locomotives and cars used in the longer trains in that service, and by reason also of the defects in freight cars as compared with the passenger cars.

For the division of these expenses the defendants proposed the use of the gross ton mile ratio, meaning a ratio arrived at by multiplying the loaded weight of the trains in each service respectively, including their engines, by the miles made in each service respectively.

On behalf of the complainant, it was contended that the straight revenue train mile basis afforded the best method for the division, and they produced witnesses who testified that the gross ton mile basis would not fairly divide these expenses because the speed of a train was an

element to be considered, and that its destructive force upon roadbed was greater in proportion than the destructive force due to mere weight.

I am convinced from the testimony that the gross ton mile theory does not afford a proper basis for a fair division, because it does not give proper weight to the element of speed, and I am convinced from the testimony that the straight revenue train mile basis does not afford a proper basis for the division, for the reasons I have already given in adopting a modified train mile basis.

I am convinced, further, that it is impossible, in the present state of railroad development, to determine the relative destructive effect upon roadbed of weight as compared with speed in such a manner as to arrive at a result expressed in dollars and cents. Assuming, however, that the gross ton mile basis would afford a proper measure for the division of maintenance expenses due to traffic, it was demonstrated during the argument, and I find, that in the operations of the complainant during the year 1912, the application of this theory to the expenses caused by traffic as compared with the use of the straight revenue train mileage basis, would assign to the passenger department only $23,424 less than would be assigned to it on the straight revenue train mile basis.

It is fully established by the testimony in this case that it is the general custom among railroads to maintain common tracks and roadbed to a higher standard on account of the necessity of having a smoother and better kept roadbed for passenger traffic than would be necessary if only a freight business were done, and also that the common tracks and roadbed of the complainant were so maintained. The weight of the testimony is to the effect that this extra cost of maintenance attributable to the passenger service approximated 20%, which of itself would more than counterbalance the extra expense of

maintenance claimed by the defendants to be due to greater destructive force of the freight traffic.

Defendants' Objection No. 21 is made to my finding in the last foregoing paragraph. The objection as stated is to so much of my reoprt

> "as finds the evidence to show that the line and road of complainant is better maintained than if maintained for freight service only."

It will be observed that this does not correctly state my finding, which was as follows:

> "It is fully established by the testimony in this case that it is the general custom among railroads to maintain common tracks and road-bed to a higher standard on account of the necessity of having a smoother and better kept road-bed for passenger traffic than would be necessary if only a freight business were done, and also the common tracks and road-bed of the complainant were so maintained. The weight of the testimony is to the effect that this extra cost of maintenance attributable to the passenger service approximated 20%, which of itself would more than counterbalance the extra expense of maintenance claimed by the defendants to be due to greater destructive force of the freight traffic."

I saw and heard the witnesses who testified on this subject, and have reconsidered the testimony, and I still think that the conclusion at which I arrived is the only proper conclusion to be drawn from the testimony. There was testimony introduced by the defendants in which the witnesses gave it as their opinion that, as a matter of economy in operation, it is desirable to keep a freight

road maintained to as high a standard as one doing both freight and passenger business.

The question of railway economy thus raised is not covered by my finding here objected to, except as it is impliedly involved in the finding as to the general custom of railroads in this regard. The question of economy has not been treated as being in issue in this case, and it is manifestly a question that would be very difficult, if not impossible, to solve except by long continued practical tests. If the question were to be judged upon the testimony here, we should have, on the one hand, the opinion of three of defendants' witnesses, and on the other the general custom of railroads in actual practice. As the railroads would not follow that custom unless they considered it better economy than the opposite custom, and as their course in this regard is determined upon by practical men of large experience with their own interests at stake in their decision, I think the custom entitled to greater weight as evidence than the opinion of the engineers to the contrary. However, it must be borne in mind that economy is not the only element to be considered in this connection. There are also the elements of safety of operation and the safety and comfort of the passengers. It is self-evident that the consideration of safety requires that on a road which carries passenger trains at a speed of from 30 to 60 miles per hour, tracks should be maintained at a higher standard than on roads carrying only freight trains at a speed of from 15 to 30 miles per hour. I find that the exigencies of the passenger business on complainant's railroad reasonably call for a passenger train speed 100% greater than the freight train speed reasonably called for by the exigencies of the complainant's freight business, and that a due regard for the safety and comfort of passengers calls for a higher standard of track maintenance on its common tracks than

would be required for the safety of its freight trains on tracks used only for freight traffic.

Whether it would be more profitable to maintain exclusive freight tracks at as high a standard as the common track than to maintain them only at the standard required for the safety of the freight trains is a mixed question of economics and mechanics on which it would be very difficult to form an adequate judgment, and upon which, as already stated, I regard the general practice of railroads as entitled to more weight as evidence than the individual opinions either pro or con of civil engineers.

There was undsputed testimony in the case that on complainant's road there is a loss of power in freight engines due to the super-elevation of curves for the passenger service, which might properly be attributable to the passenger service, in loss of fuel which, in 1912, amounted to $855.

There was undisputed evidence in this case that 2¾% of the time of freight trains on the road is attributable to the delays caused by the preference given to the passenger service to keep the trains in that service on time, as near as may be, and it would follow from this that of the transportation expenses of the year 1912 at least $5,500 which have been allocated to wages paid to freight enginemen and freight train men would more properly be charged to the passenger service. These delays also would cause an extra use of coal in the freight service which would reduce the amount properly assignabe to that service and increase the amount properly assignable to the passenger service by more than $2,000.

There was undisputed evidence that a considerable amount of cost is attributable to the passenger service on account of freight hauled for its use in freight trains,

for which no charge is made. The complainant claims that this item on coal, ties, ballast and rails alone exceeds $3,400 per year.

There are also other expenses charged to the freight service, which, if the amount could be determined, might properly be charged to the passenger service. On the other hand, there are expenses charged to the passenger service which, if the amount could be determined, would be properly chargeable to the freight service.

I find that the weight of the evidence shows that of these indeterminable expenses, the part which would properly be chargeable to the passenger service would exceed the part chargeable to the freight service, but, because they are indeterminable, I cannot use them to increase the known expenses of the passenger service. But my finding as above expressed ought to, and does, somewhat weigh with me in the conclusion announced in the next paragraph.

It is perfectly obvious that a mathematically accurate division of these common expenses of maintenance is not possible; it is only a *fair* division that can be arrived at, and in view of all the facts appearing from the evdence, I find that the modified revenue train mileage basis, which I have adopted for the division of common property, and for the division of the operating expenses of maintenance of way and structures due to weather causes is also a reasonably fair basis for the division of the expense due to mechanical wear, and fairer than any other that has been proposed.

The determination of the proper ratio to be applied to the common items of Maintenance of Way and Structures expenses having been effected, there remains no dispute between the parties as to the proper division of any of the items of expense under this heading.

The same thing is true of all the items of expense under the heading "Maintenance of Equipment".

The same thing is true of all items under "Traffic Expenses," except that the complainant contends that the exepenses of Industrial and Immigration Bureau should be divided on the modified revenue train mile basis, while the defendants insist that it should be divided in the relation to the gross revenue derived from the freight and passenger business respectively. Of the two methods thus proposed, I think the gross revenue basis more fairly reflects the benefits received by the respective services, and I have therefore adopted it. Under Transportation Expenses, there is no dispute except as to the item, Interlockers, Block and Signal Apparatus, Operation, Crossing Flagmen and Gatemen, and Engine House Expenses, Road.

With reference to the first two of these items, defendants contend, if I correctly understand them, that they should be divided in proportion to the freight and passenger yard switching, while the complainant contends that they should be divided on the modified revenue train mile basis. I think that either of these methods would be reasonably fair, but as the expenses covered by these accounts are incurred primarily and principally for the protection of trains, I think that they are more properly assigned upon the modified train mileage basis, and I have, therefore adopted that basis.

Defendants' Objection No. 22 is directed to my conclusion that account number 91, "Crossing Flagmen and Gatemen", can be properly divided on the modified revenue train mile ratio. Defendants claim that these expenses would be more properly divided in the proportion of the freight and passenger yard switching.

Upon reconsideration, I am of the opinion that the

modified revenue train mile ratio is not proper for this division. On the other hand, a division in proportion to the freight and passenger yard switching would assume that flagmen and gatemen were employed only to protect the public against switching operations, an assumption which is certainly not allowable. These expenses were incurred, beyond any question, both for the protection of the public against trains and against switching operations. I have therefore decided to make the division upon a composite ratio obtained by combining the straight revenue train mile ratio with the yard switching ratio. This for 1913 will assign 25.44% to passenger and 74.56% to freight.

The Engine House expenses, the defendants contend, should be divided upon a modified locomotive mileage basis, while the complainant has divided them upon the basis of the engine housings. I am inclined to think that the engine housings more fairly reflect the benefits derived by each service from these expenses, and I have therefore adopted that method.

General Expenses.

The common expenses under this heading I have divided on the basis of the totals resulting from the division of Maintenance of Way and Structures, Maintenance of Equipment, Traffic Expenses, and Transportation Expenses—which seems to me an entirely fair and unobjectionable method.

Under this heading of General Expenses, it is claimed by the defendants that all the expenses of this litigation should be excluded, for the reason that it is an extraordinary expenditure of a kind that is not likely to occur again, and the complainants claim that all such expenses have been excluded in their testimony and exhibits. The

defendants claim, however, that the complainant has not excluded all that should be excluded. On this subject they say:

> "It has not, however, gone far enough. It deducts only the law expenses which are directly charged against this expense. (Delf. R. p. 7751.) It does not deduct for the expenses of time of the auditor and his large force of assistants, who have devoted much of their time to the case, nor does it make any deduction for the valuable services of the president, who has, for a couple of years, devoted almost his entire time to it, nor does it make any allowance for the engineering force, general manager or general superintendent, who have devoted time (R. pp. 3496-7) and we doubt whether there is anything charged against it for special train service, which, upon reading the testimony of Berry, Riggs, Young, Loweth, Cadarette, and others, will be seen to be a large item."
>
> "One dollar per mile for this train service is not more than the company charges for this character of service."

If, by this statement, defendants mean that because the officers and employes of complainant have devoted a portion of their time to this litigation, that therefore a portion of their salaries must be treated as part of the expenses of this litigation, then I hold to the contrary, for the effect would be to assume that the normal expenses of the departments affected were less than they really were.

If, on the other hand, the defendants mean that the expenses of the departments mentioned were in excess of what they would have been in consequence of work done in them in connection with this case, and that the amount of such excess expense has not been excluded from the

complainant's expense account, and if their contention should be found to be correct, the amount of these extra expenses should be so excluded. But the evidence does not show that there was such additional expense. It shows affirmatively that there was no such additional expense not charged to this case in 1912 (Record p. 3496). And as regards the year 1913, there is no testimony on that particular point.

There is nothing in the evidence from which I could find such additional expense, and the amount thereof. Nor is there anything in the evidence from which a deduction could be made on account of salaries of officers who have given time to the case; as the evidence does not show how much of the time of any officer has been given to the case or the amount of his salary.

With reference to the cost of special trains, the testimony does not show that there was any such service; but it shows that if there was any such service in 1912, it was charged up in the expenses incident to this suit.

In the absence of evidence showing that there was special train service which should have been charged to the expenses in this case, and excluded from complainant's general expense account, there is no basis for a deduction to be made by me from complainant's expense accounts. If there were, in fact, any such additional expenses in 1913, which should be but have not been excluded, it is hardly possible that their amount could be great enough to have any perceptible effect upon the case; but if the court should find it essential that the testimony should show whether there was or was not such additional expense in 1913, and the amount of it, if any, I would recommend that the court allow the introduction of further testimony for that purpose.

I have therefore excluded from the expenses for 1912 the sum of $19,083, and for 1913 the sum of $25,690,

those being the amounts which I find from the evidence should be excluded for the purposes of this case, and which figures both parties have used in making these deductions in their statements of operations submitted to me.

The methods adopted for the division of each of the various accounts will be found set forth in Exhibit 6 hereto attached.

Having made this division of expenses between passenger and freight, we arrive at the amount of the total expenses of the complainant's passenger business in Michigan.

Division of Michigan Passenger Operating Expenses Between Intrastate and Interstate.

Certain passenger expenses can be allocated between intra- and interstate. It is agreed between the parties that in general, the remaining expenses can be apportioned on the basis of the respective passenger miles traveled intra- and interstate in Michigan, and all except the following have been so divided:

The passenger proportion of the expenses of the Soo bridge I have assigned entirely to the interstate.

The accounts of Outside Agencies and Advertising, under Traffic Expenses, have been divided on a basis agreed to between counsel.

The accounts Station Employes and Station Supplies and Expenses, I have apportioned between intrastate and interstate passenger on the relation of the number of passengers traveling interstate and intrastate, which seems to me a more proper basis than that of passenger miles. This division might also be made on the relation of the tickets sold at stations, which method would be more favorable to the complainant, but I prefer to divide it on the relation of the number of passengers traveling.

It was contended by the complainant that the cost of carrying on the intrastate passenger business was much greater per passenger mile than in the interstate business, and witnesses in this case testified that the extra expense was from 15% to 25%. It is contended by the defendants that such testimony in this case is subject to the criticism of somewhat similar testimony in the Minnesota rate cases, and I agree with that contention. Although this testimony may be held to sufficiently establish the fact that there is such greater expense, it does not satisfactorily show the amount thereof, and therefore cannot be given effect.

To the foregoing division of passenger operating expenses between inter and intra defendants' objection No. 23 is interposed. In making that division, I understood that counsel had agreed as there stated, but it now appears that I was in error as to the position of defendants' counsel, for the objection claims that I was in error in my division of Michigan passenger expenses between intrastate and interstate on the basis of passengers carried one mile, i. e., in proportion to the number of passenger miles of each class of passengers, and claims that a less proportion of the expenses should be assigned to the intra because of the greater density of intra traffic, on the ground that owing to such density, the cost per passenger mile is less in the intrastate.

By density of traffic is meant the relative volume of traffic over a given section or division of the road as compared to the volume over another section, the density being in proportion to the volume.

It is, of course, true that, other things being equal, and subject to certain limitations, it costs less to transport a passenger a mile when the volume of traffic is large than

when it is small. But it does not follow from this that it costs less to transport an intra passenger than an inter passenger. Such a result could follow, if at all, only in case these two classes of passengers were carried in separate conveyances. Whenever both intra and inter passengers are carried indiscriminately in one and the same train or car, it can no more be said that it costs less per mile to carry an intra passenger than it does to carry an inter, than it can be said that it costs less per mile to carry a white man than a colored man.

Therefore, any decrease in cost per passenger mile that there may be resulting from increased density of traffic on a certain section of the road applies to each passenger equally whether he is inter or intra. Such is the case on complainant's road. The evidence shows that intra and inter passengers are not carried separately but are carried together indiscriminately and on the same trains; that all of complainant's passenger trains connect with roads delivering interstate passenger traffic, and all of them carry both inter and intra passengers. If the number of intra passengers which they carry is greater than the number of inter passengers, that fact does not make the actual cost of carrying one of the former any less than that of carrying one of the latter.

It may be, however, that the defendants' claim here is that although the actual cost of carrying an intra passenger is the same as that of carrying an inter passenger when they are carried on the same train; nevertheless, in a division of costs between the two services, the intra should be charged with less expense per passenger mile, because the additional cost of carrying the excess of intra passenger miles over the inter is not as great per passenger as the cost per passenger mile of carrying the inter passengers and an equal number of intra passengers. In other words, that the cost of carrying all the

inter passengers and of an equal number of intra passengers should be equally divided between the two services, and the intra charged only with the excess cost of carrying the additional number of intra passengers, which would be less per passenger mile. Is there any principle that requires such a division? I do not think so. I do not think that the interstate passenger service can be used in that way to further reduce the cost of the intra service. If there were no inter service, the total cost of the intra service would be much greater than it now is, and the cost per intra passenger mile would be correspondingly greater than in the division that I have made. In the division on the basis of passenger miles in the two services, each service gets the benefit of working in conjunction with the other, and that is all the benefit that either is entitled to.

Such a division as defendants here contend for would seem to be an unwarranted discrimination against interstate traffic in favor of the intra, and a placing of a burden upon the former for the benefit of the latter.

The problem is to make a proper division between the intra- and interstate services of the expenses incurred in rendering the combined services. Those expenses are incurred for both services combined, and they should be borne by each in proportion to the extent to which each service avails itself of the facilities paid for by these expenses. Is this extent properly measured by the number of miles that a passenger is carried in each service? It seems to me that it is, and I am unable to see how it can be as properly measured in any other way.

Defendants also object to my apportionment of the accounts "Station Employes" and "Station Supplies and Expenses". (Objection No. 24.)

This objection is that the expenses of station employes, supplies, and the other stational expenses should

be divided between inter and intra on the basis of the number of miles traveled by the passengers in each class rather than on that of the number of passengers in each class. As between these two methods of division, the one chosen should, of course, be that which best reflects the extent of the use of the stational facilities made by each class. That this is so there would seem to be no room for question; and if this is so, there would, in like manner, seem to be no room for question that, as between these two bases of division, that of the number of passengers should be chosen. Practically every passenger in each class uses the stational facilities for every journey, and the use which he makes of them is practically the same, regardless of the length of his journey. If he rides only ten miles, his use of the stational privileges is the same as though he rode 100 miles or any other distance. It would seem clear, therefore, that a division on the basis of miles traveled, whatever else may be said of it, would not reflect, except in very distorted fashion, the actual use of the stational facilities by the two classes of passengers. In such division the use made by a passenger riding 100 miles would, as reflected in the division, be ten times as great as that of a passenger riding ten miles, when in fact the use would be the same. At all events, there is nothing in the fact that a passenger rides 100 miles which would tend to show that he makes any greater use of the stational facilities than a passenger who rides 10 miles.

As these stational facilities are provided for the use of passengers, and as they are available equally to both of the classes of passengers in question, and as all passengers in either class presumably make the same use of them, I can see no objection to dividing the expense of operating them on the basis of the number of passengers using them. And especially can I see no reason for

objecting to it as unfair to the intra passengers, because it is altogether certain that the average use of an intra passenger is greater than that of an inter passenger, because a large proportion of the intra passengers are local passengers, each of whom uses the stational facilities twice in connection with each journey, whereas the greater portion of the interstate passengers use them only once in each journey.

I am satisfied that these stational expenses should be divided on the basis of the number of passengers, rather than on that of miles traveled by the passengers in each class.

Division of Taxes.

It is agreed by both parties that taxes should be apportioned between the services, passenger and freight, respectively, and between intrastate and interstate passenger and freight, respectively, in proportion to the respective valuations, first deducting the proportionate amount of taxes on the Michigan property assigned to Wisconsin. To do this properly, there must be excluded from the valuation the value of the property owned by corporations other than the complainant, because these other corporations pay their own taxes, and the share thereof which falls on complainant is included in its expenses. Therefore, before determining the proportion, I have excluded all the property in Schedule 34, "Ferries and Steamships", and in Schedule 36, "Terminals", being all the property of the Mackinac Transportation Company, the Saint Marie Union Depot Company and the New Jersey Bridge Construction Company included in my valuations.

Probable Earnings Under the Two-Cent Rate.

Having found the amount of net earnings in a typical year under the 3¢ rate, it remains to estimate therefrom what the annual net earnings will amount to under the 2¢ rate.

On this question, the complainant claims that the earnings to be expected under the 2¢ rate will be found by reducing to 2¢ per mile all the fares in excess of that rate charged under the 3¢ rate in the typical year.

The defendants admit, of course, that such reduction in the revenue realized from the passenger miles shown in the typical year will result from the reduction in rate, but deny that the total of passenger earnings will be thus reduced. They claim that the reduction in rate has two distinct and different effects, both of which must be considered; that while the reduction in rate causes a decrease in passenger earnings in one way, in another way it causes an increase in earnings by causing a large increase in passenger traffic—an increase so great that the total net earnings under the 2¢ rate will be substantially as great as under the 3¢ rate. This claim of the defendants, if sustained, would put an end to the case. If it is a fact that the prescribed rate will cause no loss in revenue, there is, of course, no ground for this suit. Is it a fact? The defendants offer no proof in support of this allegation. Instead of undertaking to prove the allegation to be true, they contend that it devolves on the complainant to prove that it is not true; and in support of this contention, they invoke again the presumption in favor of the validity of legislative enactments and claim that by virtue of that presumption, the burden is on the complainant not only to prove every allegation necessary to show prima facie that the statute is confiscatory, but also to disprove every counter allegation which, if true, would render the statute non-confiscatory,

or create a reasonable doubt of its being confiscatory; that the reduction in rate will, of a certainty, cause some increase in traffic, and that the statute cannot be held confiscatory until it is shown affirmatively that that increase will not be sufficient to overcome the loss caused by the reduction, or sufficient to cause a reasonable doubt in that regard.

This claim assumes that there is a legal presumption that the reduction in rate will cause an increase in traffic sufficient to overcome the loss caused by the reduction in rate, or at least sufficient to raise a reasonable doubt that the loss so caused will not be thus offset to such an extent as to save the statute from being confiscatory, and that the complainant must overcome this presumption by proof to the contrary. To be more specific, the claim assumes that if the complainant proves that the net earnings from the total passenger miles of the typical year would, under the 2¢ rate, be insufficient to yield a fair return on the property employed, the presumption in favor of the statute is not thereby overcome, because there still remains a presumption that the decrease in rate will cause an increase in traffic that will increase the earnings, and that the statute must be held constitutional until it is affirmatively shown that such increase in earnings will not be sufficient to bring the total net earnings up to an amount that would constitute a fair return upon the property employed, or sufficient to create a reasonable doubt of its insufficiency in that regard. Is there such a presumption arising from the presumption in favor of the statute? If so, the complainant's case must fail, for in order to prove that the increased traffic will not be sufficient to have that effect, it is necessary to prove what that increase of traffic will amount to, and to do that is impossible. Assuming that there will be some increase in traffic, there is no ground whatever on

which to form a rational estimate of what that increase will amount to. Any attempt to make such estimate would be guess work of the vaguest kind.

Does the law indulge such presumption and thereby impose this impossible burden of proof? I find that it does not; that the presumption in favor of the statute is not of such character as to produce this result. That presumption is itself founded, as we have seen, on a presumption that the legislature has judged the precise question involved and judged it correctly on satisfactory evidence. This being so, the presumption in favor of the statute can extend only to such questions as could have been judged by the legislature, and cannot extend to questions that could not have been so judged. In other words, a question of fact which, from its nature is not susceptible of proof, and is therefore beyond the power of the courts to determine, is also beyond the power of the legislature to determine, and cannot therefore be assumed to have been legislatively determined. I find that the question as to the amount of increased traffic to be anticipated from the reduction in rates is such a question, and that there can therefore be no presumption that the legislature adjudged it and found that the increase in traffic caused by the reduction in rates would be sufficient to overcome the loss in earnings resulting from the same cause; and therefore that the complainant is not required to prove the amount of the increase in traffic.

This, however, does not relieve the complainant from meeting the question presented by this possible increase in traffic. The burden of proof is still on them to prove the unconstitutionality of the statute beyond a reasonable doubt, and it therefore is necessary to meet the question whether there is such a possibility of increase in

traffic, and if so, whether it is sufficient to create such reasonable doubt.

Upon this question, I find that there is not only a possibility, but a very strong probability, that there will be some increase in traffic—that there will be a greater number of passengers carried and a greater number of passenger miles made under a 2¢ rate than there would be under the 3¢ rate. I find, also, that it is wholly impossible to make any rational estimate in actual figures of the amount of that probable increase, but that it is morally certain that the increase will be comparatively small, for the reason that the increase will be only in local travel for pleasure and in a region so sparsely settled as that which is tributary to the complainant's road, only a small increase in such traffic can reasonably be expected. This view of the probable increase finds confirmation in the experience of the company during the twelve years preceding the year 1914. According to the accounts for those years which are in evidence, the number of passenger miles per annum increased during that period approximately 20%—from 27 millions plus in 1902 to 33 millions plus in 1913. At about the middle of that period, viz: in September, 1907, there was a reduction in rate from 4¢ per mile to 3¢.

On the defendants' theory that a reduction in rate will result in a corresponding increase in volume of traffic, this reduction of 25% in rate in 1907 should have been followed by an increase in passenger miles in 1908 sufficient to overcome the loss, which increase, it would seem, would have to be at least 33⅓%, but instead it was followed by a decrease of a trifle under 3% in that year, and in the succeeding year, 1909, it was followed by another decrease of a trifle over 3%. Since 1909, the passenger mileage has fluctuated somewhat, but has not approached the 1907 mileage until 1913, when it came

a little within 100,000 miles of the latter. The mileage for 1907 was, for the fiscal year ending June 30, 1907,—three months before the reduction in rate took effect, so that the large mileage of that year was wholly under the 4¢ rate and the mileage of 1908 was three-fourths under the 3¢ rate. This experience, of course, does not prove that a decrease in mileage is to be expected from a reduction in rates. But it very strongly confirms the above conclusion that the probable increase of traffic to be expected from the rate reduction in this case is small and very uncertain in amount.

My conclusion is that the possible increase in traffic which may result from the decrease in rate is too small and uncertain and too much a matter of mere speculation to be allowed to be made the basis of any calculations. and that in estimating the results of future operations, it must be assumed that the probable earnings to be expected under the 2¢ rate will be found by applying to the passenger mileage of a typical year the 2¢ rate to the whole fare mileage, and 1¢ rate to the half fare mileage, and the 3¢ rate to the mileage of passengers who travel only five miles or less, as those are the rates provided in the act complained of.

The conclusion here reached seems to be fully supported by the cases of Chicago & N. W. R. R. vs. Dey, 35 Fed. 866-81, and Re Arkansas Rate Cases (St. L. & S. W. Ry. vs. Allen), 187 Fed. 390.

In the former case, the Court, per Mr. Justice Brewer, says:

> "It is said that it cannot be determined in advance what the effect of the reduction of rates will be. Oftentimes it increases business, and who can say that it will not, in the present case, so increase the volume of business as to make it remunerative, even more so than at present. But speculations as to the

future are not guides for judicial actions; courts determine rights upon existing facts. Of course, there is always a possibility of the future; good crops may increase transportation business; poor crops reduce; high or low rates may likewise affect; but the only fair judicial test is to apply the rates to the business that has been done in the past and see whether upon that basis such rates will be remunerative, or compel the transportation of business at a loss."

In the latter case, this language is quoted and the principle enunciated is applied.

To my determinations under the heading, "Probable Earnings under the Two-Cent Rate", defendants' Objection No. 26 is directed. There are six different grounds, designated (a), (b), (c), (d), (e) and (f), as follows:

(a) That there is no proof that there will be any loss.

If this means anything different from what is meant by specification (d), then the answer to it is that it is not only proved, but it is undisputed and unquestionable that there will be a loss on every passenger mile made under the reduced rate. If it means that there is no proof that this loss will not be overcome by increased traffic resulting from the reduction in rate, it is identical with specification (d).

(b) That "there is no basis for a conclusion that increased traffic will not result from the decreased rate."

The assumption here involved that I found or drew a conclusion that increased traffic would not result from the decreased rate is erroneous. I neither drew such conclusion or made such finding. On the contrary, I

found that in all probability some increase in traffic would so result.

(c) That "said rate never having been put into operation, there is no experience or basis on which to estimate loss due to putting it into effect."

This is simply another form of the proposition that no rate can be enjoined or contested unless and until it has been put into operation, and kept in operation for an indefinite period long enough to demonstrate by experience what the actual loss will be.

If this proposition is sound, this case would never have proceeded farther than the motion for a preliminary injunction, as the court would have held then and there that the suit was prematurely brought and could not be maintained until the rate had been tested by experience. The proposition need not, therefore, be discussed here.

(d) That "there is no testimony that increased traffic due to the decreased rate will not so increase the volume of traffic carried that there will be no loss."

The question whether it devolves upon complainant to prove this negative was so fully discussed in connection with my findings that no further discussion seems to be called for here.

(e) That "the presumption that increased traffic due to the decreased rate will be sufficient to overcome, in whole or in part, the loss in revenue per passenger per mile due to the decreased rates has not been overcome."

I know of no such presumption as is here assumed to exist. This is the same as specification (d), except that it is stated in another form. It assumes the existence of a presumption that would cast upon the complainant the impossible burden of proving what increase of revenue would arise from increase of traffic resulting from the decrease in rates. That there is no such presumption

seems to be recognized by defendants in argument under this objection when they say, "to allow complainant as loss the full difference between the amounts produced by the old rates and amounts which would be produced by the new rates is to disregard the experience, which amounts almost to a presumption, that traffic will increase." This specification is the same in substance as (c) and (d), but stated in another form.

(f) That "the conclusion that the reduction in rate of 1907 did not result in increased traffic is unsupported by the evidence, and the proper conclusion therefrom is that an increase did result from such reduction."

The assumption here made that I made a finding or drew a conclusion that the reduction in rate in 1907 did not increase traffic is incorrect. On that subject I made no findings but merely gave the undisputed figures shown in the testimony (which speak for themselves) as tending to confirm the conclusion thereinbefore drawn, that the probable increase of traffic to be expected from the rate reduction in this case is small and very uncertain.

Defendants argue at considerable length under this objection in support of their contention that no rate can be enjoined or its validity tested until its effect has been proven by actual experience gained by putting it into operation for such length of time as will be sufficient for that purpose, but the authorities cited do not, in my judgment, sustain that position, and it seems to me clear upon principle that no such general doctrine can be held.

In arguing it, defendants entirely disregard the fact that the question of the amount of increased traffic in any case, arising from a reduction in rates, will depend upon the special conditions of the particular road in question.

Those conditions might be such as to render a large

increase probable, or they might be such as to render any considerable increase very improbable or even impossible. In order that there can be an increase there must be in the territory served by the road what may be called potential traffic, waiting to be developed into actual traffic by a reduction in rates. In this case there is, in my judgment, no such potential traffic as could possibly be expected to develop into sufficient actual traffic to overcome the loss, or to overcome any material portion of it. This conclusion is drawn from the testimony in the case, and is based upon the sparsity of the population and its location or distribution in the territory traversed by the road; and the conclusion is strongly confirmed by the effect of the reduction in rates in 1907, which effect is shown by the evidence in this case and from which it appears clearly that there was not, at the time of that reduction, any appreciable amount of potential traffic capable of being developed into actual traffic by a reduction in rates.

It appears from the evidence that in each of the three years following 1910 there was an increase in the number of intrastate passenger miles over those in the preceding year, so that the number of intrastate passenger miles made in 1913 was 15% greater than those made in 1910.

As to the cause of this increase there is no direct and positive evidence. The defendants claim that it was an increase in intrastate traffic proper and was due, in the main, to the decrease in the rate made in 1907, and that it proves their contention that the decrease in rates will produce a considerable increase in traffic. But the complainant claims that it was not a genuine or legitimate increase in the volume of intrastate traffic proper, but a fictitious or borrowed increase, drawn from the interstate traffic by the opportunity afforded by the refund receipts for interstate passengers to obtain a lower fare

by purchasing and using intrastate tickets wherever practicable. In support of this contention they cite the fact, also shown by the evidence, that contemporaneously with this increase of 15% in intrastate passenger miles there was a decrease in interstate passenger miles of 21%.

Each of these opposing theories attributes the increase in intrastate passenger miles to the decrease in rates, the difference between them being as to the class of travelers from which the increase is drawn. If, as claimed by complainant, it was drawn from the interstate traffic, it was not a benefit to complainant, but a distinct injury; and it would be a kind of grim irony to charge it up to them as a benefit derived from the decrease in rates.

The question whether this increase in intrastate passenger mileage was made by passengers whose entire journey was intrastate or was, in whole or in part, by passengers whose journey was in fact interstate, but performed in part on intrastate tickets, is one upon which there is no direct testimony and which, therefore, must be decided on probabilities. Which theory as to the origin of this increase is most in accordance with the probabilities? The fact that the increase in intrastate passenger miles was accompanied by a decrease in interstate passenger miles of an amount that corresponds so nearly with the increase in intrastate passenger miles,—the former being 3,040,272 and the latter 3,385,863 passenger miles,—creates a very strong probability that the increase in the intra came from the inter. And this probability is much strengthened by a consideration of the relative strength of the appeal to the two classes of travelers made by the decrease in the rate. It is evident that the inter passenger is much more likely to be induced to use the lower rate on a journey which he is going to take in any event, than that the general public would be in-

duced by it to take an intrastate journey which they would not otherwise take.

My conclusion from the evidence is that the increase in intrastate traffic in question is not a real increase in such traffic, but an increase derived in the main from an addition to the intra passenger mileage made by interstate passengers on intra tickets. The correctness of this conclusion I find to be strongly supported by the cases to which I have been referred by complainant's counsel, among which I mention particularly the following: Corporation Commission of Oklahoma vs. A. T. & S. F. Ry., 31 I. C. C. Reports, 537; Arkansas Rate Cases, 187 Fed. 290; and Boyle vs. St. L. & S. F. Ry. Co., 222 Fed. 539. These cases show that wherever tests have been made it has been found that where there has been a reduction in intrastate rates, without a corresponding reduction in interstate rates, the result was to increase the intrastate travel, but only at the expense of the interstate travel, and that the real increase in intrastate travel, caused by the reduction of the rate, has been negligible. As was said by the court in the last named case:

> "On the part of the State it is contended that the reduced rate of two cents a mile would stimulate that traffic to such an extent that the intrastate business would be the gainer, or at least not a loser. For the interstate passenger business the company charged three cents, and in order to ascertain what the effect on that claim is, a test was made for the month of August, 1913, which, it is claimed, shows that while it increased the intrastate business, it did it at the expense of the interstate business. (The two cent rate went into effect on this road in July, 1913.) In order to get the exact factors, train auditors and collectors were, after the two cent rate was put in effect, put upon all trains crossing the borders of the state,

with instructions to make a detailed check of all passengers who bought tickets or paid fares on the train at the boundary stations of the state. These reports show that there was an abnormal increase in the purchase of tickets at those boundary stations. * * *

"From the evidence the court finds as a fact that the two cents rate does not stimulate passenger traffic, except at the expense of the interstate. People are not in the habit of traveling merely because rates are lower. It is probably different when special reduced rates are made for certain occasions, but in such cases it is the special occasion which causes it."

Before concluding the consideration of this subject, I desire to make my ruling and its effect so clear as to leave no room for doubt or misunderstanding, and this can best be accomplished by correcting a misunderstanding of it which the defendants evidently have.

In argument under this objection on page 45 of their objections, they say:

"The result of the Master's ruling is to deny the test of experience or the necessity therefor. The result of the rulings in the deciding cases is that where there is an appreciable return, as there is in this case, upon the Master's computation, the test of experience will be required."

The result of these two statements is an assertion that my ruling on this subject is in direct conflict with the decided cases, and if both statements are correct, there would be such conflict; but in my view, neither of them is correct.

As regards the rulings in the decided cases, if it is true, as stated by defendants, that the decided cases hold that wherever the evidence shows that there will be "an ap-

preciable return" (which means any return at all over and above operating expenses), the courts will require the test of experience under the new rate before passing upon the validity of the rate, then my ruling is in conflict with the cases and must be modified accordingly. But I do not so understand the cases. I know of no case where this doctrine has been held. As I understand the cases, the result of them is, not that the courts will refuse relief and require a test of the rate whenever it appears that there will be an appreciable return, but that they will or will not require such test before acting in any case according as it may seem to them most proper in view of all the probabilities of the case. The fact that the evidence shows that some return is to be expected under the new rate is, of course, an important element to be considered in estimating these probabilities, but it is the size of that return, and not the mere fact that there will be some return, that is important. Given the amount of the return that the evidence thus shows is to be expected, notwithstanding the reduction in rates, the question is whether that amount will be sufficient either in itself or taken together with some augmentation to be reasonably expected to result from the reduction in rates. If it is sufficient in itself, that ends the matter; if it is insufficient in itself, then it remains to determine the probabilites as to whether that insufficiency will be overcome by increase in traffic. And those probabilities will depend upon the amount of the deficiency and the prospects of increased traffic, judging from all the conditions of the business as regards past experience, density of traffic, sparsity of population, competition, etc., etc. These considerations might be such as to call for a suspension of judgment until the rate is tested, or they might not. The insufficiency might be so small, and the prospects of increased traffic so great, that no actual test would be deemed neces-

sary in order to reach the conclusion that the rate was not confiscatory; and on the other hand, the insufficiency might be so great, and the prespects of increased traffic so small and remote, that no actual test would be deemed necessary in order to reach the conclusion that the rate was confiscatory; and again the insufficiency and the prospect of increase taken together might be such as to leave the question in such doubt that an actual test would be deemed desirable before coming to a final decision.

It was on this understanding of the law that my ruling was made. Proceeding on such understanding of the law, and applying it to this case, the question is, Into which of these three classes of cases does this case fall?

On this question it certainly cannot be claimed that it falls within the first,—that the insufficiency is so small and the prospects of increased traffic so great as to justify the conclusion that there will be no loss. The only question, therefore, is whether it falls within the second or the third class. My ruling is that it falls within the second class,—that the insufficiency is so great and the prospects of resultant increased traffic so small that it is in this case unnecessary to put the rate to actual test before reaching the conclusion that it would, if enforced, be confiscatory.

If I am wrong in this conclusion, then the case, in my judgment, necessarily falls within the third class, and a test of the rate should be required before final decision.

In that case I assume that the court would not at present make any final disposition of the case, but would order that the test be made and retain jurisdiction of the case until the test had been completed and the results shown; and then decree accordingly.

By their objection No. 29, the defendants claim that I was in error in refusing to permit the introduction of, or to consider, the report showing passenger earnings for the fiscal year 1914.

In this objection defendants are mistaken as to the facts. The record shows that no such report was ever offered in evidence. The defendants' counsel reserved the right to apply to the Master or the court for leave to go into the matter of the passenger accounts of the complainant for the year 1914. No application for such leave has since been made to me; and if such application were now made, I am unable to see how it could consistently be granted without including also the fiscal years 1915 and 1916, which have now been completed, or to see how they could be used for any purpose, since 1913 is to be taken as a typical year and is the only year for which property values have been determined. (See Record pp. 10,716-8.)

Complainant's Freight Business.

The testimony in this case was all taken and the argument completed before the decisions by the Supreme Court of the United States in Norfolk & Western Ry. Co. v. Conley, and Northern Pacific Ry. Co. v. North Dakota. Afterwards, I requested counsel to state what matters that had been litigated in this case were affected by these decisions. Complainant took the position that the effect of the decisions is:

(a) To render it unnecessary for the Master to make any division of freight revenues or expenses between the inter and intra business.

(b) To render it unnecessary to make any division of exclusive freight property between the inter and intra business.

(c) To render it unnecessary to determine any property values, revenues or expenses, attributable to the ore business as separate from other freight business, inter or intra.

(d) That it will be necessary to value the entire property in Michigan, and to determine the entire revenues and expenses in Michigan.

(e) The opinions do not affect in any way the necessity of valuing the exclusive passenger property and dividing it between inter and intra; nor the valuing of the property used in common in the freight and passenger service; the dividing of it between passenger and freight; and the dividing of the passenger proportion between inter and intra. Nor do they affect in any way the necessity of making like determinations and divisions of expenses between freight and passenger, and of the passenger proportion thereof between inter and intra. Nor do they affect in any way the necessity of ascertaining the freight and passenger revenues, respectively, and as to the passenger revenues, the inter and intra amounts thereof.

Defendants agreed with complainant as to "d" and "e" but were of the opinion that "a", "b" and "c" were matters which I should cover in my findings and report. I therefore proceed to cover all of the freight matters thus called for and not hereinbefore discussed.

Division of Michigan Freight Property Between the Intra- and Interstate Business.

The value of the complainant's Michigan freight property is shown in Exhibit 1 hereof, wherein I have found the value of the complainant's entire property in Michigan and also the portion thereof used in its passenger

business, the value of the freight property being the balance of all the property valued by me in Michigan.

The paries are agreed that division of this freight property between the intra- and interstate business should be upon the proportion which the Michigan freight ton miles in the intrastate and interstate business, respectively, bear to the total Michigan freight ton miles.

The records of the company prior to 1912 were not so kept as to show the division of the freight ton miles between intra and inter, but they were so kept as to give these figures for the years 1912 and 1913, and it is my judgment that the use of the average of these two years will express a more stable relation than the use of the mileage of any one year, and I have therefore taken this average, by which I arrive at a division which assigns 26.48% to the intrastate and 73.52% to the interstate.

Before applying these percentages, I have deducted the freight proportion of the value of the so-called Soo Bridge, and assigned it entirely to the interstate business, and I have also assigned to the interstate business the value of the Marquette ore docks.

Attached hereto, marked "Exhibit 8", is a summary of the division of the freight property in accordance with this method.

Division of Michigan Freight Revenues Between the Intra- and Interstate Business.

The Michigan passenger revenues I have already determined. The balance of the Michigan revenues are freight.

All revenues for carrying freight, which constitute the bulk of the freight revenues of the complainant, have been allocated as between the intrastate and interstate business. Those revenues which could not be so allocated have been apportioned between the intrastate and inter-

state business on the basis of the allocated revenues. There is no disagreement between the parties as to this being a correct method.

Division of Michigan Freight Operating Expenses Between the Intra- and Interstate Business.

The passenger operating expenses of complainant having already been determined, the remainder of the operating expenses are assignable to freight, and it is only necessary to divide such freight expenses between the intrastate and interstate business in Michigan.

It is contended by the complainant that the cost of doing the intrastate freight business is much greater per ton mile than the cost of doing the interstate freight business. Witnesses in this case testified that the expense per ton mile was at least twice as great in the intra as in the inter. It is contended that this testimony is not subject to the criticism of somewhat similar testimony in the Minnesota Rate Cases. I am not able to agree with this contention.

I think that the fact is established by the testimony that there is a greater expense, but the amount of it is not by such opinion testimony satisfactorily established.

But the complainant claims that even if the haulage cost in the two services is the same per ton mile, nevertheless terminal and stational expenses cannot be properly divided on the relation of the freight ton miles made in the intra- and interstate services, respectively, but should be divided in proportion to the tons handled in the stations and terminals.

It seems to me that in this contention complainant is correct. The cost of assembling and delivering freight in stations and terminals has no relation to the miles over which such freight is carried.

If, then, the terminal and stational expenses can be de-

termined with reasonable accuracy, it follows that they should be divided between the intra- and interstate business in proportion to the number of tons handled at stations and terminals. The complainant claims that such cost can be ascertained.

In general outline, the method of making the proof was as follows:

Complainant does a considerable amount of iron ore business in the haulage of ore from mines to ore docks at Marquette, from which docks the ore is loaded into vessels. This business is entirely interstate. The freight operating expenses for the fiscal years 1912 and 1913 were first separated so as to show with approximate accuracy the expenses chargeable to the transportation of to these docks and those chargeable to transportation of other freight which is in part intrastate and in part interstate business.

The operating expenses of the other freight business for the years 1912 and 1913 were then analyzed so as to show the stational and terminal expenses included therein, viz, the expenses arising from services performed in originating and delivering freight at stations on the road in Michigan, and in receiving and delivering freight interchanged with other carriers at Michigan junction points.

These stational and terminal expenses consist of the entire amount of yard expenses and the station expenses attributable to the freight business under the general heading "Transportation Expenses", and of sections of certain other expenses as follows:

It was proved, and is undisputed in the case, that 39.01% of the time of all freight trains passing over complainant's road was spent at stations between terminals, during which time they were engaged in switching operations or doing other stational work. From this it

may fairly be inferred that 39.01% of the following expenses of road freight trains under the general heading "Transportation Expenses" is chargeable to stational or terminal service, viz: "Engine House Expense—Road", "Fuel for Road Locomotives", "Water for Road Locomotives", "Lubricants for Road Locomotives", "Other Supplies for Road Locomotives", "Road Engine Men", "Road Train Men", and "Train Supplies and Expenses".

For the same reason, 39.01 of the following expenses under "Maintenance of Equipment" is chargeable to stational or terminal service: "Superintendence", "Steam Locomotives—Repairs", "Steam Locomotives—Renewals", "Steam Locomotives—Depreciation", "Freight Train Cars—Repairs", "Freight Train Cars—Renewals", and "Freight Train Cars—Depreciation".

The total of these stational and terminal expenses thus determined aggregated in 1912 $405,365, and in 1913 $469,405.

The evidence shows that the movement of all freight traffic in 1913, other than ore to docks, was analyzed, and the number of tons of intrastate freight and the number of tons of interstate freight interchanged with other carriers at Michigan junctions ascertained. There was also ascertained the number of tons of intrastate freight, and the number of tons of interstate freight originated at Michigan stations, and the number of tons of intrastate freight and the number of tons of interstate freight delivered at Michigan stations.

It was shown that in 1912 and 1913 more than 95% of all freight traffic in Michigan (other than ore) was transported in car-loads.

It was shown by the undisputed testimony that the stational or terminal service performed in interchanging carload freight with other carriers at junctions is much

less per car than that performed in originating or delivering it at stations on the line of the road, and that on the average it was not more than one-fourth of the latter.

Accordingly, the number of tons of interstate freight received from connecting lines at Michigan junctions, and the number of tons of intrastate freight delivered to connecting lines at Michigan junctions, was multiplied by one-fourth, as such freight received one-fourth terminal service at the junction.

The number of tons of intrastate freight that originated at Michigan stations on the line, and the number of tons of intrastate freight delivered at Michigan stations on the line, was multiplied by one, as such freight received one terminal service.

The total of those products of intrastate business amounts to 1,424,952 and indicates the volume of stational or terminal service given in Michigan to intrastate freight.

Exactly similar computations were made on the interstate freight business, and the total arrived at, viz, 1,159,939, indicates the volume of stational or terminal service given in Michigan to interstate freight.

The volume of terminal service to intrastate freight 1,424,952 equals 55.3%

The volume of terminal service to interstate freight 1,159,939 equals 44.7%

We thus arrive at the percentages which should be applied in the division between the intra- and interstate freight service in Michigan of the stational or terminal expenses for the years 1912 and 1913, respectively, hereinbefore stated.

1912	55.3%	of	$405,365	=	$224,167 intrastate
	44.7%	of	405,365	=	181,198 interstate
1913	55.3%	of	469,405	=	259,581 intrastate
	44.7%	of	469,405	=	209,824 interstate

All the other freight expenses (i. e., all expenses except stational expenses and general expenses), viz, $672,404 in 1912, and $755,707 in 1913, I have divided between the intrastate and interstate business in the proportion that the intrastate ton miles and the interstate ton miles bear to the total ton miles in each of the years, respectively.

The "General Expenses", which amounted to $51,171 in 1912, and to $50,335 in 1913, I have divided between the intrastate and interstate business on the basis of the totals resulting from the division of all other freight expenses as hereinbefore described.

There is no dispute between the parties as to the division of freight expenses except in the matter of the terminal or stational expenses and the "General Expenses". These stational and general expenses I have divided in the manner above described as being the most equitable method of division.

1912 Freight Operating Expense.

	Total	Intrastate	Interstate
Freight other than ore to Marquette Docks	$1,129,334	$434,902	$694,431
Ore to Marquette Docks	246,346		246,346
Total 1912	$1,375,680	$434,903	$940,777

1913 Freight Operating Expense.

	Total	Intrastate	Interstate
Freight other than ore to Marquette Docks	$1,276,037	$509,026	$767,011
Ore to Marquette Docks	210,030		210,030
Total 1913	$1,486,067	$509,026	$977,041

It is claimed by the defendants that the testimony upon which I base my finding as to the average stational service

given a ton of freight in the interchange thereof with another railroad consists entirely of opinion testimony, and that opinion testimony does not furnish a sufficient basis for such a finding.

The finding, however, is based only in part on opinion testimony as hereinafter explained, and such opinion testimony was not of the same character as that which was criticized in the Minnesota Rate Cases. The opinion evidence on this point in this case was from employes of the complainant thoroughly familiar with its method of interchanging freight, and of the amount of service required therein. It was shown further, undisputed in the case, that in general such interchange was made in loaded cars placed on delivery tracks conveniently arranged so that little expense was involved in either putting the car onto the exchange track or taking it therefrom.

It was further shown that the complainant, in receiving freight at stations on its line, is compelled in general, first, to spot cars to be loaded, often at industries considerably distant from its main line, then, when the cars are loaded, haul the cars to its main line; and that in delivering freight, the service is the same with the process reversed.

It was further shown in the evidence that at junction points usually several cars at a time, amounting at some junctions to more than 500 cars a week, are interchanged, whereas in the delivery or receipt of freight at stations on the line, the deliveries are in fewer car lots, there being over 200 stations on the road in Michigan where freight is originated and delivered as against only 12 junction points where freight is interchanged. The fact that the interchange business involves less stational service than is involved in originating and delivering freight at statons is proved by undisputed evidence; the amount of this excess is shown only by opinion evidence. From

this opinion evidence I find that the relative service on this interchange business does not exceed one-fourth of the service that is performed in originating or delivering freight at stations on the line of the road. The results of this division are as above shown.

If, however, the court should be of the opinion that I am wrong in giving weight to this opinion testimony of employes, based on actual experience, a division of terminal and stational expenses can be made upon the assumption that interchange freight receives the same terminal or stational service per car as all other freight.

In that event, the division of the operating expenses between intra and inter will be as follows:

1912 Freight Operating Expenses.

	Total	Intrastate	Interstate
Freight other than ore to Marquette Docks	$1,129,334	$393,122	$736,212
Ore to Marquette Docks	246,346		246,346
Total 1912	$1,375,680	$393,122	$982,558

1913 Freight Operating Expenses.

	Total	Intrastate	Interstate
Freight other than ore to Marquette Docks	$1,276,037	$460,930	$815,107
Ore to Marquette Docks	210,030		210,030
Total, 1913	$1,486,067	$460,930	$1,025,137

The percentages which I have used for the division of stational and terminal expenses are derived from carload freight. This I consider sufficiently accurate, as this is, as I have already stated, more than 95% of the entire freight.

The complainant also made an analysis of the less than carload freight in Michigan (see Complt's Ex. 87, Delf) for the year 1913, which shows that the proportion of such service given to the intrastate business is more than the proportion derived from the carload freight, but as the amount of less than carload freight is very small, I have disregarded this difference and used here only the proportions arrived at from the carload business.

The detail for the division of terminal expenses is to be found in complainant's Exhibits 74 to 80, inclusive, Delf.

The Rate of Return to which Complainants are Entitled.

Having found the value of the property employed, and the rate of return upon that value that is to be expected under the two-cent rate, we come to the third and final main question, viz: Is that rate sufficient to constitute the fair return to which the complainants are entitled under the Constitution?

As this question depends upon what rate of return it is that the company is entitled to, I will proceed to consider the latter question as the proper method of determining the former.

In some instances, it is possible and practicable to determine the former question without determining the latter; for example, it may be found that a return of 2½% is insufficient without finding exactly what percent is required in order to afford a fair return; but such finding would not be a complete finding in any case; and when made in the report of a Master, it is also insufficient. It is there insufficient because the Master's finding as to what rate of return is to be expected is subject to review, and to a change which would raise a new question as to the sufficiency of the expected rate and

thereby render immaterial his finding as to the sufficiency of the rate found by him to be expected; and it would be incomplete because it is impossible to say, with any proper degree of certainty, that any given rate is insufficient without adopting and applying a criterion by which to judge such sufficiency; and when such criterion is adopted and fully applied, the rate to which the company is entitled is necessarily thereby determined.

It is evident, therefore, that the determination of the proper rate of return is as clearly a part of the duty of the Master as the determination of any other question in the case, and I shall therefore proceed to determine that question.

For the determination of that question, we have already provided the true criterion of judgment, so that it is here only necessary to apply that criterion, the same being found in the findings of law made by me in the beginning of this report at the request of the defendants, as follows, viz:

> "The rate of return to which a property is entitled is ordinarily that at which capital will seek investment in properties of similar character in that community or locality."

This enunciation of doctrine is also accepted by complainant and there seem to be no room for question that it is, both on economic and on equitable principles, the true and only true criterion by which to judge the fairness of a rate of return. It gives to the public the service at as low a rate as they could obtain it in the open market if the service were a commodity obtainable in the open market, and at the same time, it does not take an undue advantage of the company by compelling them to render the service for less than it is fairly worth when considered as a marketable commodity. Inasmuch as it

is accepted by both parties, the only question regarding it which can arise here is as to the correctness of its application.

Proceeding now to make such application, we find, curiously enough that, although proposed by one party and accepted by he other, it has not been directly applied by either.

In the briefs filed, the complainants claim that the fair rate of return to which they are entitled is eight percent (8%) and they base their claim upon the ground of general equity, but they do not claim, unless by implied inference, that that rate is equitable because it is the minimum rate at which capital would seek investment in this or similar property; and the defendants make various claims on various grounds with no reference to the criterion in question and no apparent relation thereto. As stated in their brief, the complainants' claim is as follows: that

> "under all the circumstances, considering the nature and extent of the traffic, the character and efficiency of the service, winter and other unusually hard operating conditions, the value of the property devoted to the public use, the results of its entire railroad operations for the last twenty-seven years, and further taking into account, inter alia, the possibility of loss of its ore and other business, the exhaustion of forest products and the water and all rail interstate and intrastate commercial and competitive conditions it encounters and the actual lack of substantial increase in the volume of both intrastate and interstate passenger busines as the years roll by, the complainant is entitled to earn net not less than eight percentum (8%) annually upon the fair value of all its property in Michigan devoted to the public use—and net not less than eight percentum (8%)

annually upon the fair value as herein apportioned, of all the property of the complainant in Michigan devoted to its intrastate passenger business."

Applying to this the above criterion, this contention is sound if eight percent (8%) is the minimum rate of return at which capital will seek investment in this or similar property, but otherwise it is not. If capital will not seek investment in this or similar property at a less rate of return than eight percent (8%) the complainants are entitled to that rate; if it will seek investment at a lesser rate, then they are entitled to only the lesser rate. The question whether capital will thus seek investment at a lesser rate and if so at what rate, the complainants do not discuss; and before proceeding to discuss it, I will direct attention to the defendants' claims.

The various claims which, as I have said, are made by the defendants, are set forth in their brief as follows:

> "The amount of return which should be permitted varies in different localities, and with different classes of investment, the high mark being regarded as six percent. The question of what is a sufficient rate is a matter of proof; it is incumbent upon the complainant to show the rate of return to which its property is entitled. It has not made such proof, and for that reason, if there be any return, the court must regard it as sufficient. In Michigan, the interest rate is five percent, the rate paid by complainant upon certain of its bonds is four percent, and it is a well known fact that investments in railroad property in this state, do not net more than the last named rate." (Brief p. 148.)

that, if the question is to be determined by the court in the absence of such specific evidence, then

> "the rate of return is necessarily governed by the

going rate of interest or return upon similar investments in the community." (Brief p. 140.)

and that

"in Michigan, the interest rate is 5%, the rate paid by complainants on certain of their bonds is four percent, and it is a well known fact that investments in railroad property in this state do not net more than the last named rate." (Brief p. 148.)

Also that

"6% is generally recognized as a sufficient rate of return in all parts of the country." (Brief p. 147.)

Also that

"the amount of return which should be permitted varies in different localities and with different classes of investment, the high mark being regarded as 6%." (Brief p. 148.)

Herein, it will be noted, the defendants set up another claim which, if sustainable, is decisive of the case in their favor. If, as they here claim, there is no evidence from which to find the rate of return to which complainants are entitled, or to find that they are entitled to more than the rate of return which is to be expected, there can be no finding that the prescribed rate is confiscatory. The claim, however, is, in my judgment, not well founded. It assumes that the only evidence from which the proper rate of return can be found is opinion evidence based on the judgment of experts in railway financiering—an assumption that is unwarranted. Such expert evidence is not a necessity in this or any other judicial procedure, but is merely an aid to judicial deliberation. Its function is, not to prove the facts on which judicial action is to be taken, but to assist the court in drawing the proper inferences from facts proved by other evidence.

It is from these facts that the court must draw its conclusions, whether it has or does not have the help of expert opinion. It would be helpful in this case to have the opinion of experienced financiers as to the minimum rate at which capital would seek investment in this property, but it is not a necessity. Both the expert opinion and the judgment of the court must needs be based upon the facts proven to, or cognizable by the court, and the function and duty of the court to pronounce judment on those facts is the same, whether it is performed with or without the aid of expert opinion. Those facts are the circumstances and conditions of this property which affect its earning power, both present and prospective, and it is upon them, as they are shown in this case, that the court is to form its judgment.

The next claim of the defendants is in the nature of an alternative to that last mentioned, viz, that if the question is to be determined by the court in the absence of expert evidence, then,

> "the rate of return is necessarily governed by the going rate of interest or return upon similar investments in the community." (Brief p. 140.)

This claim is exceedingly indefinite. The "going rate of interest" and "the rate of return upon similar investments in the community" are wholly dissimilar and disconnected facts, and to say that the rate of return is to be governed by one or the other of these facts is to leave the matter suspended in mid-air. If it is governed by one, the other has no bearing upon it. However, this does not matter, for, in my judgment, it is governed by neither of these for the following reasons:

As regards the first—the going rate of interest. The subject of interest rate is one that calls for particular attention in this discussion because it is frequently and variously treated as determinative of the proper rate of

return, and also because, although not so determinative in fact, it has an indirect bearing on the determination of that rate. Such attention, however, will be deferred for the present as it is sufficient to say here that the claim here made by defendants regarding interest rate is inconsistent with their claim that it is the rate at which capital will seek investment in similar property that is to govern, and it is not, therefore germane to the application of the latter principle which we are here making, but on the contrary, is, as a governing factor, necessarily excluded from the case by the adoption of the latter principle.

Rate of Return from Similar Property as a Criterion.

As regards the defendant's alternative to interest claim, viz, that the rate of return is to be governed by the return being realized from similar property in the locality—this, also, is inconsistent with their claim that it is the rate at which capital will seek investment that is to govern.

The mere fact that a certain kind of property is paying a certain rate of return on its reproduction cost does not prove that other capital would seek investment in that property at that rate, or tend to prove it. There is always a great deal of property that capital could not be induced to replace at the rate of return which is being realized from it. Moreover, every "similar property in the locality" if there were such, would be operating under rates artificially limited by statute, and its rate of return, therefore, could furnish no criterion for the purpose in hand.

Furthermore, such a criterion could not, in any event, be applied here because there is no other "similar property in the locality" whose rate of return could be taken

as such criterion. This railroad property is practically *sui generis* in this regard and must be judged accordingly. In order to be a "similar property in the locality" any other property would have to be a railroad property serving the same territory and would therefore be practically a duplication of this property.

The foregoing claims made by defendants are such that I am unable to gather from them exactly what it is that the defendants claim is the rate of return that the complainants are entitled to, further than that it cannot exceed six percent, in any event, and should be considerably less.

Relation of Required Rate of Return to Rate of Interest.

The rate of return which we are seeking to determine, bears a kind of superficial resemblance to rate of interest, and in consequence, it has not infrequently been confused or unduly associated with the latter as substantially identical therewith, as was done in the above mentioned claim of the defendants.

The fact is, that the rate of return which would cause capital to seek investment in property is closely associated with and much influenced by the existing interest rate, but this is due to an external relationship between the two and not to any substantial identity. In determining the proper rate of return, therefore, it is important to consider the subject of interest rate and its precise relationship to the rate of return that will suffice to attract capital to a given property investment.

There are three distinct rates of interest, two of which are fixed by statute and the other by convention, viz: (1) the maximum rate permitted by statute to be contracted for, (2) the rate provided by statute where no rate is stipulated, and (3) the prevailing or going rate

of interest in the community. Of these, the two former have no relation whatever to the question as to what would be a proper rate of return from a given property investment. The fact that the legislature considers a certain percentage the highest rate of interest that parties should be permitted to contract for or that a certain other per cent is the proper rate that a party should be required to pay for the use of money in the absence of a stipulated rate is no indication, whatever, of the minimum rate that would induce capital to reproduce and operate this property. There is no relationship here between the latter and either of the two former that would make the one in any respect the measure of the other, or give it any particular bearing in that regard.

But with regard to the going rate of interest the case is different. That rate does afford some indication of the rate that would be required for the latter purpose because both are dependent upon the money market and each influences the other. But they are not the same. If the going interest rate is 6% it does not follow that the same money market that furnishes the money for a 6% interest investment will be induced to furnish the money for a property investment for a prospective 6% return—that it will be induced to furnish the funds for the construction and operation of a railway for the prospective maximum return of 6%. On the contrary, the fact that the money can be invested at 6% in interest bearing securities proves that investors cannot be induced to invest in this property for a prospective maximum return of 6%, for the very obvious reason that the former is, as regards return, a certain, while the latter is an uncertain, investment—the one an interest bearing investment, and the other a property investment. It is a truism of economics that a higher prospective rate of return is demanded for a property investment then for

an interest bearing investment — usually very much higher.

How much greater the prospective rate of return would have to be in any particular case would depend upon the degree of uncertainty as regards the realization of the prospective return, and that degree of uncertainty would depend upon the facts and circumstances of the particular case. Given the going rate of interest, the problem in every individual case would be to estimate the additional return that would be required in order to compensate for the uncertainties and consequent risks of that particular enterprise. The first step, therefore, is to determine the rate that is to be taken as the going rate of interest. The going rate of interest fluctuates at different times and in different places, according to a great variety of circumstances, but the fluctuations are not very great and a fairly constant average rate is maintained. It is safe to say that the going rate of interest in Michigan on moderate amounts reasonably secured is 6% and in large amounts well secured from 5% to 5½%. Upon the large amount that is involved in this case, I find that the going rate of interest is 5%. On this basis the complainant's claim of 8% would call for an increase of 3% over the interest rate in order to compensate for the uncertainties of the business, and enlist the required capital. Those uncertainties, as above quoted from complainant's brief, are, severe winters and other unusually hard operating conditions, the exhaustion of forest products, the possibility of a loss of its ore, and other business, the competitive conditions encountered both from water and rail competition, and the lack of any substantial increase in the business during the 27 years of operation. Precisely what effect these uncertainties would have upon the mind of a prospective investor, it is, of course, impossible to say, but that they would cause him

to demand considerably more than the going rate of interest as a condition of making the investment is very certain.

Some light upon this question is obtainable from the company's own experience.

When the State of Michigan and the United States desired the construction of the road from Marquette to Houghton, which now forms part of complainant's system, it was found necessary to make large donations of public lands in aid of the project although a passenger rate of five cents per mile was allowed to be charged. The same thing was true when the State desired a road to be constructed from St. Ignace to Marquette, and this piece of road it was never possible to operate profitably as a separate property.

I think it a fair inference from the testimony that the line between Nestoria and Duluth was constructed chiefly in the hope of remedying this situation. The history of the earnings of the complainant for the 27 years since it acquired these properties does not show that the conditions and uncertainties have since changed for the better, and it is very doubtful whether even a prospective return of 8% would induce capital to seek investment in this property. To what extent those conditions have, in fact, changed, it is hard to say, but it is well known that the country tributary to the road is, generally speaking, still in an undeveloped condition—a condition as regards development and opportunities and prospects for the earnings of this railroad, little, if any more favorable than when the consolidated company was formed.

From the foregoing considerations and viewing the subject from every standpoint, the conclusion would seem to be justified that if the required capital could be induced at all to reproduce and operate this property, it could not be so induced by a prospective return of less

than the 8% claimed by complainants which would be an increase of 3% over the going rate of interest as found by me. I do not, however, find that the complainants are entitled to that rate of return, but following the rule of resolving all doubts in favor of the defendants, I reduce the 3% increase by one-half, and find that the minimum rate of return which the complainants are entitled to under the constitutional guaranty is 6.5%.

The foregoing conclusion is predicated entirely on the application of the criterion, that it is the per cent of return that would cause other capital to seek investment in this property, that the company is entitled to, which criterion is accepted by both parties in this case. The adoption of this criterion by both parties in this case necessarily excludes all others, and I have, therefore, not deemed it necessary to discuss any other. There is, however, a different theory which ought perhaps to be referred to, the theory, namely, that the proper criterion is the rate of interest prescribed by statute where no rate is stipulated—that if the prescribed rate of fare will yield a rate of return equal to that statutory rate of interest the rate of fare cannot be held confiscatory. This theory, it seems to me, is the result of a misapprehension of the particular kind of so-called confiscation that is here complained of—the same misapprehension that gave rise to the doctrine formerly held by the courts but now abandoned, that if the rate of fare yields any return at all on the property, the rate is not confiscatory. The theory assumes that the act here complained of is confiscation in the ordinary sense, which means the taking away of the ownership and possession of property held in private ownership, and transferring it to the public; whereas it is in fact not confiscation in that or in any proper sense of the word confiscation as ordinarily used but an unlawful act that bears some resemblance to con-

fiscation in that it takes away from private owners and gives to the public some of the benefits of ownership. Whether it is thus confiscatory or not depends not upon whether the owners are deprived of the ownership of their property or of any portion of it, but whether they are deprived of any of the benefits of their ownership. If they are deprived of any of these benefits, that is to say, deprived of any portion of the fair return from the property to which they are equitably and therefore constitutionally entitled, the act is confiscatory within the meaning of that word as used in this class of cases, and therefore unlawful.

Assuming that the company is entitled to a full and fair return upon the value of the property, it will seem to be so obvious as to admit of no argument that if by legislative enactment any portion of that fair return is taken away there is confiscation in effect as certainly as though some portion of the physical property were actually taken.

This being so it will be seen that the fact that the legislature considers a certain rate of interest to be the fair measure of damages for breach of a contract for the payment of money is no criterion or indication by which to judge the question whether a given rate of fare is or is not thus confiscatory.

Resume.

I have now finished the consideration of the three principal questions on which depends the one main question in the case—that one question being whether the prescribed rate will afford a fair return on the value of the property employed and the three principal questions subordinate thereto being, (1) the value of the property employed, (2) the rate of return thereon to be expected under the prescribed rate, and (3) the rate to which the

complainants are entitled under constitutional guaranty.

I have found (1) the entire value of complainant's property to be $13,901,938; (2) the value of the property employed in the complainant's Michigan intrastate passenger service to be $2,741,872; (3) the rate of return to be expected thereon under the prescribed rate to be 2.24 per cent, and (4) the rate of return to which complainants are entitled under the constitution to be 6.5%.

These results differ widely from those claimed by either of the parties. The latter are as wide apart as the poles.

The complainants claim that the present value of their entire property is $17,044,081; while the defendants claim that it is only $11,457,169; the difference between the two claims being $5,586,212, or approximately 50 per cent of the latter. As between these conflicting claims my valuation of $13,901,938, it will be noted is much nearer that of the defendants than that of the complainants, being $3,142,143 less than the complainants and $2,444,769 more than the defendants. And as a matter of actual valuation it will be seen on examination that the difference between my valuation and that of the defendants is much smaller than those figures would apparently indicate, because the difference above mentioned is largely made up (more than 50 per cent) of items disputed *in toto* by defendants and omitted entirely from their valuations: those items amount to $1,347,657, and are as follows:

Contingencies (Schedule 37)	$ 400,000
Interest during construction (Schedule 40)	547,657
Taxes during construction (Schedule 40)	100,000
Appreciation	300,000
	$1,347,657

The questions involved in these items although tributary to the work of valuation are questions of law and of method of valuation rather than questions of value.

Deducting the total of these disputed items from the excess of my valuation, over that of the defendants, makes the difference in actual valuation to be $1,097,112.

Of this latter amount the greater part consists in differences of land valuation, those differences amounting to $634,828. The total of my land valuations is $1,780,-239, being $329,616 less than that claimed by complainants, and $634,828 more than the value conceded by defendants. Upon these differences in land valuation a word of general comment and explanation here seems desirable.

Land valuation, always a difficult matter, is especially difficult here, because of the great number of parcels and the wide differences between them, both as regards locality, character, and surrounding conditions and also because the valuation must be made from the testimony. It is always easy to find expert appraisers who will place a high value on a given parcel of land and equally easy to find those who will place a low value, and the latitude for honest difference of opinion is frequently such that there may be a wide difference between estimates made by witnesses equally honest and trustworthy. Such instances are quite numerous here, and this together with the great number of separate parcels to be valued and the great volume of testimony to be considered have made the task of land valuation a very arduous one. There are more than 160 different descriptions of land to be valued separately and several thousand pages of testimony relating thereto. To the work of valuing all of these lands in the light of the testimony introduced, I have given a great deal of time, and study—possibly more than the exigencies of the case absolutely required;

but if so, it was because I thought it better to err, if at all, in that direction, rather than in the opposite one. Moreover I am thereby enabled to feel a greater assurance than I otherwise could of the fairness of my valuations. I am convinced beyond a reasonable doubt that, while my valuations may, in some individual instances err on one side or the other, the total of my land values is a fair and conservative estimate of the value of complainants' lands such as is called for in a rate case, and that it does substantial justice to both parties.

The residue of the excess of my valuation over that of the defendants, viz: $462,284, is largely due to differences in estimates of degree of depreciation, affecting present value, rather than direct estimates of value. In two of such instances, amounting to $170,124, the question in dispute was not as regards the amount of depreciation, but whether there was or could be any depreciation whatever. These instances were Ballast and Track Laying and Surfacing; the defendants claiming that the former had depreciated in the amount of $107,000 and the latter in the amount of $63,124. Aside from these items the excess of my valuation of the physical property other than lands over that of the defendants is only $292,160, a considerable part of which consists of differences in amount of depreciation. Here as in the case of land values, I believe my valuation to be substantially just to both parties and that the errors, if any, cannot be such as would materially affect the final result.

With regard to the rate of return on these property values to be expected under the prescribed rate, the parties are no less at variance. The complainants claim that according to the results of the business of 1913 the results to be expected from the Michigan intrastate passenger business under the reduced rate will fail to pay any return at all on the value of the property; not only

so, but that it will fail even to pay operating expenses by the sum of $32,794.10.

On the other hand the defendants claim that the Michigan intrastate passenger business under the reduced rate will according to the results of 1913, be highly remunerative and will yield a very large return on the value of the property employed therein. They present seven different estimates of the same made upon as many different bases. These vary in amounts and percentages of return, but each claims a very high rate of return on the value of the property employed in the passenger service—the lowest being 11.73 and the highest being 21.74. They are as follows:

	Passenger Intrastate	Freight
1	21.74	3.70
2	19.58	4.30
3	18.22	4.68
4	15.50	2.58
5	19.25	1.72
6	13.04	3.19
7	11.73	3.56

In all these claims the valuations of the property and its allocations and divisions between services are substantially the same, and in all of them the amounts of total income are the same. So that the variations of percentages between the different estimates are due chiefly to variations in the bases of division, of property, income and expenses.

In these claims the total property valuation taken by defendants is $11,457,169; the passenger proportion $2,360,305 and the intrastate $1,547,888. The total property valuation thus taken ($11,457,169) is arrived at by applying to the Riggs' appraisal of 1913, the modifications which defendants claim should be made. These

estimates are thus made on a basis of reproduction cost, although the defendants claim that it is commercial value rather than reproduction cost value that is to govern, and that the former is shown by the evidence to be a less amount than the latter, viz, $11,144,946. It is immaterial, however, whether these estimates are based on the one valuation or the other, for they have no bearing on the question whether the statute is confiscatory, because they are all based on an assumption which prejudges the question of confiscation — the assumption, namely, that there will be no reduction in earnings in consequence of the reduction in rates. They make no allowance for any reduction in earnings, but assume that the earnings under the 2 cent rate will be at least as great as they have been under the 3-cent rate, because of increased traffic. When this assumption is made it is idle to go farther. If the new rate will not reduce the earnings either gross or net, the statute can, of course, by no possibility be confiscatory and the case is ended then and there. Any division of property or expenses or computations of percentages made thereafter would be useless as they could not alter the fact that the statute is not confiscatory in any event.

These estimates and computations, however, are instructive in their reflex bearing on the question of the division of property and expenses between passenger and freight—a bearing which tends strongly to confirm the method of division adopted herein. There can be no question that in the regulation of rates either by the State or otherwise, passenger rates and freight rates should be adjusted with a view to producing an equitable division of the burdens to be borne by travelers and shippers respectively so that neither shall be compelled to bear the proper burdens of the other. The two services, passenger and freight, although necessarily treated as separate and

distinct for the purposes of this case, are, to a great extent, a joint enterprise in which each is largely dependent upon the other. They are so dependent, because under existing rates, neither could exist financially without the other. More than three-fifths of all the property employed by the complainants in railroad use is used in common by both services and as all this common property would be required for the rendition of either service alone in the absence of the other, neither service could be rendered by itself alone without a large increase in rates for that service—an increase in all probability greater than the business would bear. It is quite certain that this road would not be built either as an exclusive freight road or as an exclusive passenger road. Hence it must be assumed that the rates fixed by the State are adjusted with a view to producing a proper adjustment of burdens to be borne by the two services respectively. And as it would be necessary in making such adjustment to make a division of the common property and expenses, it must also be assumed that the State before enacting this statute made such division and made it with that end in view. This being so, is it possible to assume that the method of division of common property and expenses employed by the State for this purpose was the method here employed by defendants, or one that would be productive of such results as are shown by these estimates to be produced under the method of division employed by defendants? According to one of these estimates the passengers traveling on complainants' road are paying a return of 21.74 per cent on the value of the property employed in their service, while the shippers of freight are paying only 3.70 per cent on the value of the property employed in their service; according to another of the estimates the former are paying 19.35 per cent and the latter only 1.72 per cent and all of these show a similar

great disparity in per cent of return. And as above pointed out, this disparity is due chiefly to the method of division employed. As it cannot be supposed that the State would make an adjustment of rates which would yield so large a return on the passenger property, and so small a return on the freight property, thereby either compelling passengers to bear a large part of the burden properly chargeable to shippers or else confiscating a large part of the company's freight property for the benefit of the shippers, it would seem clear that the defendants' method of division is not that which was employed by the State in adjusting the rates, or a method of division which should be chosen in preference to that adopted herein. As the sole purpose of the division is to arrive at an equitable apportionment of the burdens necessary to be borne, in choosing one or the other of two proposed methods that one is to be chosen which will produce the most equitable apportionment of burdens. Under the method of division employed by me, the rate of return on the two classes of property also exhibits an inequality similar in kind to that shown by these estimates, but far less in degree, the rate of return on the intrastate passenger property under the 3 cent rate being 6.89 per cent and on the intrastate freight property 3.08 per cent.

In considering the question of the division of the common property it is to be borne in mind that the division is primarily and principally a matter between travelers on the one hand and shippers of freight on the other, rather than between the company and the public.

What the company is entitled to, and all that it is entitled to, under constitutional guaranty, is a fair return on the value of the entire property both freight and passenger, and except where, as here, a separation becomes necessary because one rate only is involved, it is immaterial to the company whether passenger and freight rates

are as regards each other equitably adjusted so long as the total return is sufficient.

It appears in this case from my findings that the entire return which the company has been receiving under existing rates is insufficient to pay the fair rate of return upon the entire property to which they are entitled, and that the deficiency is due almost entirely to the failure of the freight service to pay a fair return on the value of the property employed by it; and this is so even where the freight property is determined by the division of the common property on the basis adopted by me. Even there it appears that the rate of return on value of property employed paid by shippers of freight is but little more than 50 per cent of that paid by travelers. And yet, notwithstanding this fact the defendants would here justify the proposed reduction in passenger rates by a division of common property and expenses which would greatly increase the proportion chargeable to freight, and correspondingly decrease the proportion chargeable to passenger, thus greatly increasing the mal-adjustment of rates already existing.

This method of division would, if adopted, sustain the 2 cent rate, but as the company are already bearing a portion of the burden properly chargeable to the freight service and as the portion thus unfairly borne by them would be thereby largely increased, the injustice of such a method of sustaining the rate would be very conspicuous.

This method of division proposed by defendants would if adopted defeat the complainants' case, and it is one of a number of distinct points of defense, any one of which if sustainable, would also defeat the complainants' case. Those points of defense are eight in number and are as follows, viz:

1. That the complainants are estopped from contesting the validity of the statute by the acceptance of land grants.

2. That the value on which complainants are entitled to a return is commercial value and that the same has not been proven.

3. That the common property and expenses must be divided between passenger and freight on the basis of time of occupancy as proposed by defendants.

4. That the sleeping and dining car services must be treated as outside operations and not a part of the service to which the prescribed rate applies.

5. That the complainants must prpove every material fact beyond the possibility of a doubt.

6. That the presumption in favor of the statute although disputable in theory is indisputable in fact.

7. That the complainants must prove by affirmative evidence that the loss from decreased rates will not be overcome by increased traffic.

8. That complainants must prove what per cent of return they are entitled to; that they have failed to make such proof, and are therefore not entitled to the relief prayed for.

If anyone of these points of defense is sustainable, the complainants' case must fail. If none of them is sustainable then the final result depends upon the question of fact, whether upon the evidence offered the prescribed rate will yield a fair return on the value of the property employed in the passenger service—the property being valued on the basis of replacement cost, and the common property being divided on the revenue train mile basis, and the dining and sleeping car property being included therein.

Upon this main question thus stated, I am convinced from the evidence beyond a reasonable doubt that a 2 cent rate will not yield such return and that its enforcement should therefore be enjoined.

In reaching this conclusion I am not unmindful of the serious nature of the case and of the remedy invoked. It is true, as has been so strongly urged by defendants, that the power of the judiciary to enjoin action taken under legislative sanction is a very high prerogative and one that should be exercised with great care and circumspection; but it is also true that the higher the prerogative, the more imperative the duty to exercise it wherever that duty is clear.

In this case, unless my findings relative to the eight points of defense above specified are erroneous, that duty, I find, is clear and its performance desirable in the interests of all concerned. This is one of those rare cases in which it is to the best interests of both parties that just and equitable results be reached—to those of the State, no less than to those of the company. While it is the duty of the counsel for the defense to maintain this law, if possible, and to that end to employ all available defenses, technical or otherwise, (which duty has been performed to the utmost in this case) it is not the interest or presumably the desire of the State that this rate be enforced against the complainants, if, in fact, such enforcement would deprive them of the fair return on the value of their property to which they are equitably and constitutionally entitled.

Such enforcement would not only be no benefit to the State, but would, on the contrary, be a distinct and serious injury, both to the State and to the community served by this railroad, in that it would inevitably cripple the company and impair the service rendered by them.

To realize that such impairment of service would thus

be a serious injury, it is only necessary to recall that this is the self-same service which was heretofore deemed so desirable by the State that it made large donations of land and permitted the charging of a five cent fare in order to secure it. And to see that this was wise policy on the part of the State, it is only necessary to consider the geography of the two peninsulas of which the State is composed and the isolation and the condition as regards economic development of the northern peninsula and its need of this railway service. This railway is not only greatly needed by the community which it serves, but is also a very important factor in promoting the commercial and industrial unity of the two peninsulas which ought to accompany their political unity, as it is the only direct railway connection between them.

Before closing this report, a word of explanation of the causes of the long pendency of the suit before the Master may be appropriate.

That length of pendency has resulted from a number of causes, but chiefly from the multitude of questions involved and the great amount of testimony deemed necessary to be taken. The time required for the latter purpose was very considerably increased by the fact that the testimony was originally taken on the same theory as that on which the testimony in the Minnesota Rate Case was taken, and when that theory was disapproved in the decision of that case, it became necessary to retake a great part of the testimony in this case, conformably to that decision—the time limited for the taking of testimony having been extended for that purpose by order of the court.

The taking of testimony began July 8th, 1912, and was completed August 12th, 1914. From the latter date until February 17th, 1915, the time was consumed in making of briefs and of other preparations for oral argu-

ment, which began on the day last mentioned and continued from day to day until March 10th following, when the cause was submitted to the Master. The length of time since consumed has been due primarily and chiefly to the great amount of work involved in the consideration of the multitude of mooted questions, both of fact and law, and of the testimony on which the former depended; and secondarily, to the temporary inability at times of counsel, by reason of illness, to give promptly the assistance required by the Master; and also to the inability of the Master to work at all times continuously because of eye strain resulting from excessive reading of typewritten matter. Although as early a termination of the cause as practicable was desirable, it is believed, nevertheless, that the time thus consumed has been, in the main, well spent, by reason of the more thorough trial of the issues involved and a fuller presentation of the merits of the case thereby attained than would otherwise have been possible.

I return herewith, as part of this, my report, the following papers and documents, viz:

A full report of the proceedings before me in the taking of testimony, consisting of 10,719 pages of typewritten testimony, bound in thirty-five volumes.

In the course of said testimony many papers, documents and maps were produced and offered in evidence and marked as exhibits as follows, viz:

On the part of the complainant 97 exhibits, numbered respectively from 1 to 96, with a duplication which causes 2 separate exhibits to be numbered "90"; on the part of the defendants 83 exhibits, numbered respectively 1 to 83; which exhibits, together with a descriptive list or catalog thereof, are herewith separately filed with the court as a part of said testimony.

In connection with their objections to the tentative re-

port, defendant's counsel requested that the details of my computations involved in reaching the results set forth in the report be made a part of my report, but as the same are voluminous and can be checked and verified by any competent accountant, I do not think it proper to embody them in the report as a part thereof, but will file them along with this report and furnish the parties with copies thereof.

Since the foregoing was written, the details of computations therein referred to have been furnished to defendants and a memorandum specifying what they deem apparent errors and needed corrections therein has been received from them by the Master—such specifications being numbered consecutively from 1 to 12 and being here taken up in their numerical order.

Specification 1. This specification claims that the revenue train mile ratio used by me is erroneous in three particulars designated respectively as a, b and c.

In respect to (a) I find that the defendants are right and have revised my figures accordingly.

In respect to (b) I find that the defendants are right as to the Michigamme Mine Branch consisting of .31 of a mile, but in error as to the other mine branches therein mentioned, as it appears from the evidence that merchandise switching was done in 1913 on the latter branches.

In respect to subdivision (c) I find that the defendants are in error as to the Hunter Branch, and the old Negaunee Mine Branch for the following reasons, viz: The Hunter Branch was in existence and was used by complainants in 1913, and it therefore participated in the stational time therein referred to.

Also with regard to the Old Negaunee Mine Branch (.96 of a mile), for the reason that the same was not included in my computations as it is a part of the Negaunee yard and that entire yard was excluded.

With regard to the Danber Branch, I find that the defendants are right in their claim that the same should be excluded and I have revised my figures accordingly.

Specification 3. This relates to a revenue item, $6,750.77, received by complainants in 1913 from the Chicago and North Western Ry. under an agreement between them and that company by which complainants received daily from the C. & N. W. Co. at Negaunee, Mich., certain trains of passenger cars belonging to the latter company and operated them on complainant's road between Negaunee and Houghton—the locomotive and entire train crew for such operation having been furnished by complainants. By the terms of this agreement the complainants received all the fares of the passengers carried in such trains between Negaunee and Houghton both through and local and also in addition a train mileage of twelve and one-half cents to be paid them by the C. & N. W. Co. It is this mileage that is represented by the $6,750.77 in question. The question is as to the proper disposition to be made of it—whether it should be accounted as passenger revenue derived from the passenger business of complainants or as a common revenue derived from the rental of the common property over which these trains are operated. In the accounts put in evidence and in the computations heretofore made, it is treated as a rental received from the use of common property and as such divided between freight and passenger in the same manner as other rentals of common property are divided, but the defendants claim that it is not a rental of property but a passenger train earning and that it should therefore be treated not as a common revenue but as a passenger revenue wholly.

In this contention I think the defendants are right. A rental of property is money paid by a lessee for the privilege of using and occupying property of the lessor,

but in this transaction the C. & N. W. Co. neither uses nor occupies any property of complainants, but on the contrary the complainants use and occupy some of the property of the C. & N. W. Co. (the cars composing the trains) and these trains are regularly operated by the complainants and they differ in no respect from the complainants' other regularly operated passenger trains except that the coaches composing the trains are owned by the C. & N. W. Co. If in addition to owning the cars, the C. & N. W. Co. owned also the locomotives and with their own crews operated the trains, the mileage paid for the operation of such trains might properly be treated as a rental of common property. This is precisely the case in another agreement between these parties under which the C. & N. W. Co. operated its own trains on complainant's road between Ishpeming and Marquette, and pays a trackage or train mileage which is treated as a rental of common property.

The precise nature of this item sufficiently appears from the terms of the agreement and the nature of the transaction and from these it appears that it is a compensation paid to complainants for their co-operation in maintaining a through passenger service without change of cars from all points from Chicago north on the line of the C. & N. W. Co. road to that section of Michigan known as the Copper Country.

It is clear that the item is a purely passenger revenue and should be so treated and I have revised my figures accordingly.

Following the foregoing specifications of error No. 3 the defendants have another specification also numbered 3 (evidently by inadvertence) which relates to gross revenue from sleeping cars.

In this specification the defendants are in error, the sleeping car gross revenue of $30,243.11 found by me in

my exhibit 5 is determined from the testimony of A. E. Delf in the introduction to complainant's exhibit 67 on sheet 24 and this amount it appears from his testimony is shown by the reports in his office of sleeping car tickets sold. As each ticket shows the point of sale and the point of destination, the revenues from sale of tickets wholly within the state allocate themselves and the revenues from sale of interstate tickets are allocable as the part of the entire journey made in each state is readily determinable. There is therefore no occasion for dividing the total sleeping car revenue between states in the manner specified by defendants or in any other manner.

Specification 4. This specification points out a clerical error which I have now corrected.

Specification 5. In my division of operating expenses for 1912 and separating to Mail and Express, I follow the method of defendant's witness Mr. Thompson but I now find that Mr. Thompson was in error in the respect here pointed out by defendants and have revised my figures for 1912 accordingly.

Specification 6. In my separation of the common property here referred to, I followed the method offered by defendants on page 234 of their printed brief. But I find that the method now suggested by them is more equitable and have revised my figures accordingly, except that I have revised their proposed correction by including overheads which they presumably omitted by inadvertence.

Specification 7. In this specification I find that the defendants are right as to the principle on which the common portions of the accounts there mentioned should be divided, but wrong in their results of the application of that principle; that the proper ratio for 1913 is: Passenger, 35.9 per cent, freight 64.1 per cent instead of

30.08 passenger and 69.92 freight, as shown in Note 10, of my Exhibit 6.

Specification 8. This specification relates to what defendants therein call the "out of pocket costs" on account of the diner service, meaning by "out of pocket costs" as I understand them, that portion of the operating expense for 1913 which would not have been incurred if dining cars had not been operated; and it says that these costs were overlooked by me and claims that they would be at least $19.715. The defendants are here correct, in stating that the finding of such costs was omitted by me, but they were omitted because they were immaterial and not from inadvertence, and they are correct also in claiming that such costs would amount to more than the amount last mentioned, as I now find them to be in fact the sum of $25,805. This amount is arrived at by applying the percentage of 39.84 given by defendants as the correct one in their specification next following, numbered 9.

Specification 9. This specification points out that the separation of expenses for 1913, assigned to sleepers and diners, heretofore made by me, was on the basis of tonnages and percentages of 1912, whereas it should have been on those of 1913. This specification is correct and I have changed my figures accordingly.

Specification 10. This specification relates to the division between passenger and freight of the annual taxes paid in Michigan and alleges that the division heretofore made does not mathematically follow the rule for their division laid down by me in the report and claims that the assignment made of the taxes to passenger in 1913 is at least $1,000 too great. In this the defendants are right in part and wrong in part. The rule of division laid down by me is that which was agreed upon by the parties as stated on page 350 of the report and is as fol-

lows: "that taxes should be apportioned between the services passenger and freight respectively in proportion to the respective valuations."

The defendants are right in their claims that in the application of this rule the part of the property in Michigan which had been assigned to Wisconsin should have been excluded, but was not; and my figures have been corrected accordingly. But they are wrong in their claim that the passenger proportion of taxes heretofore found by me is at least $1,000 too great. The amount in which it was too great was the sum of $680.09 . The passenger proportion of taxes in 1913 is $40,203.03 and the manner in which it is arrived at is shown on page 25 of the computations of exhibits 2 and 8 filed herewith.

Specification 11. This specification relates to the division of mail and express proportion of operating expenses between inter- and intrastate for 1910 and 1911, and claims that in such division the percentage of 55.95 intrastate should have been used instead of 65.95.

The ratio of 65.95 used by me was obtained in manner following, viz: a portion of the passenger operating expenses for each of the years 1912 and 1913, was assigned to mail and express; using the Thompson ratios. The amount so assigned to mail and express I opportioned to interstate and intrastate in the same manner as the total passenger operating expenses had been apportioned between inter and intra.

As there was no evidence from which like ratios could be obtained for assigning a portion of the expenses of 1910 and 1911 to mail and express, I assigned the expenses to mail and express and to intrastate and interstate on ratios derived from the totals of the 1912 and 1913 assignments. The defendants' ratio of 55.95 is evidently based upon the number of passenger miles made inter and intra, respectively in 1910.

The question therefore is which of these bases of division should be used; and I find that the basis which gives the 65.95 percentage should be used because that is the same basis on which the entire passenger expenses were divided between inter and intra for the years 1912 and 1913. On recomputation, however, I find that the percentage should be 65.81 instead of 65.95 as shown on page 23 of the computations of my exhibits 2 to 8.

Specification 12. This specification relates to the apportioning to Wisconsin of property in Michigan used in the general service and claims that in addition to the property already so apportioned there should be included certain tracks at Marquette and Thomaston which they designate as "sidings" but which are more properly called shop tracks; and certain frogs and switches. In this I find that the defendants are correct except that the two tracks at Marquette which they call "Old Car Shed East Side" and "Old Car Shed West Side" are exclusively freight tracks instead of a common freight and passenger. My figures have been revised accordingly and the same are found on page 18 of the computation of exhibit 1.

The several exhibits referred to in and made a part of this report, being nine in number and being marked Exhibit A and exhibits numbered from 1 to 8 respectively, are returned herewith and are bound in a separate volume, instead of being attached hereto, for the reason that they are of such shape that it is was impracticable to so attach them, although they are referred to in the body of the report as being so attached.

I am unwilling to close this report without some acknowledgment of the ability and thoroughness with which the work of counsel upon each side has been performed. In a case of this magnitude and complexity it would never be possible to say that everything had been

done that could aid in the correct determination of all the questions involved; but with the single exception of the question of appreciation, as hereinbefore explained, I believe it can safely be said in this case that nothing of importance that would afford such aid has been left undone by counsel upon either side.

I wish especially to acknowledge the efficient assistance which has been given the Master by counsel upon each side whenever called upon by him. This acknowledgement would not be complete if it did not include also the work of the accountants and other experts on each side which also has been no less characterized by ability and thoroughness.

In conformity to the order of the court the Master submits a form of decree which he recommends to be entered in this case, and the same is hereto annexed and made part of this report.

All of which is respectfully submitted.

HERBERT L. BAKER,
Special Master.

January 29, 1917.

UNITED STATES DISTRICT COURT,

EASTERN DISTRICT OF MICHIGAN,

Southern Division in Equity.

Duluth, South Shore & Atlantic Railway Company,

Complainant,

vs.

Grant Fellows (substituted in place of Franz C. Kuhn), Cassius S. Glasgow, Lawton T. Hemans, Charles S. Cunningham (substituted in place of George W. Dickenson), Morgan W. Jopling, John R. Van Evera and Fred S. Case,

Defendants.

DECREE.

The above entitled cause was submitted to the Master on arguments by Messrs. Arch B. Eldredge, solicitor, and Joseph B. Cotton and John E. Tracy, of counsel, on behalf of complainant, and by Roger I. Wykes, Esq., of counsel, on behalf of defendants.

After deliberation, it is ordered, adjudged and decreed,

Section 1. That the act of the legislature of the State of Michigan, complained of in this suit, being Act No. 276 of the Public Acts of the State of Michigan for the year 1911, is, in its effect upon the property of complainant,

confiscatory and will, if enforced against complainant, operate to deprive the complainant of its property without due process of law, and therefore said act is, so far as it relates to the said complainant, its officers, directors, agents and employees, hereby declared to be in violation of the Constitution of the United States, and void and of no effect as to the complainant.

Section 2. That said Grant Fellows, Attorney-General of the State of Michigan, and his successors in office, and Cassius S. Glasgow, Lawton T. Hemans and Charles S. Cunningham, and their respective successors in office, constituting the Railroad Commission of said State, be and they are, and each of them is, hereby permanently enjoined and restrained from attempting to compel the said complainant to observe, publish, post or put in force the rates of fare prescribed by the said act complained of, except as they may be hereafter otherwise authorized by this court, and that they are, and each of them is, further permanently restrained and enjoined from taking any action, step or proceeding against said complainant or any of its officers, directors, agents or employees, to enforce any fines, penalties, or punishments for the violation by them of the said act of the Legislature of Michigan, except as they may hereafter be otherwise authorized by this court.

Section 3. That said defendants, Morgan W. Jopling, John R. Van Evera and Fred S. Case, and all other persons making use of complainant's line of railway, be and they are, and each of them is, hereby permanently enjoined and restrained from instituting or causing to be instituted any action or proceeding to collect from complainant damages or penalties for any violation of the said act.

Section 4. That the subject of the costs of this suit be reserved for future consideration by the court.

Section 5. It is further ordered that the order of this court, dated the 26th day of September, 1911, requiring the complainant, during the pendency of this suit, to issue to all persons traveling intrastate on its road, refund coupons agreeing to refund to the holder of the same an amount equal to the difference between the rate of fare charged such passenger for transportation and the rate prescribed in the act complained of, is hereby set aside and annulled and said coupons are adjudged to be of no validity or value, and the bond provided to be given by said complainant for the redemption of said coupons is hereby discharged and the order heretofore entered on the 22nd day of October, 1915, directing the complainant to set aside a special bank deposit for the redemption of said coupons is also set aside and annulled.

Section 6. It is further ordered and decreed that jurisdiction of this case be, and the same hereby is, retained by this court, for the purpose that the members of the Railroad Commission and the Attorney-General of the State may apply, at any time, to the court, by bill or otherwise, as they may be advised, for a further order or decree whenever it shall appear that by reason of a change in circumstances, the rates fixed by the act complained of are sufficient to yield to the complainant reasonable compensation for the services rendered.

OBJECTIONS TO THE FOREGOING FINDINGS AND RULINGS BY THE MASTER THEREON.

The foregoing findings were on 20th day of May, 1916, served on counsel for the respective parties and opportunity was thereupon given them to make such objections thereto as they might desire.

Afterwards objections were received from the re-

spective counsel and were carefully considered by the Master.

The said objections and the rulings of the Master thereon are as follows:

Complainant's Objections.—Valuations.

The complainant objects to your valuation of Schedules 1, 3, 5, 7, 16, 19, 23, 28, 29, 30, 36, 37 and 40, and to your reduction of the amount claimed by complainant for appreciations, and will desire to make specific objections to them in accordance with the usual practice when your report is presented to the Court for confirmation. It is, however, very apparent from your report that the testimony has been carefully studied and your judgment appears to be deliberate, and therefore, in view of the very thorough argument there has been upon these schedules, complainant will not ask for further consideration of them at the present time, except as hereinafter indicated.

With reference to Schedule 19, complainant renews its objection to the assingment to Wisconsin of any portion of the value of shops, engine houses and turntables located in Michigan. It renews its contention that the location of that property in Michigan is conclusive, and that its entire value, as a matter of law, is assignable to the property upon which complainant is entitled to earn a return in this case.

The same objection applies, also, to Schedule 20 (shop machinery and tools), to which we make no other objection.

Taxes during Construction.

We desire to call your attention particularly to your allowance for taxes during construction. The average of the taxes paid by the complainant for the years 1912 and

1913 are $200,907. This is practically 1.429% on the total valuation of complainant's property which you have found, to-wit, $13,979,928. The total of the physical property items (Schedules 3-28, inclusive) in your valuation, exclusive of lands and rolling stock, is $7,808,280, on which one year's taxes at the rate above named would be more than $111,000; so that your total allowance of $100,000 for taxes during construction is less than one year's taxes on the above named schedules.

You have found the period required for construction to be not less than three years. I think we may safely assume that on that basis the first year of construction would be one of small taxes, the second of medium taxes, and the third of taxes upon practically all the property. On the basis of an average of one and a half years of taxation, which the evidence with reference to interest during construction would clearly justify, the allowance for taxes should be at least $165,000.

If we assume, however, that taxes should be computed for the same time that you have used in computing interest during construction on the schedules above mentioned, the allowance would be $128,344.

It is perfectly apparent from Mr. Hansel's testimony with reference to his allowance of $50,000 for taxes on property other than lands, that he went upon the theory that before the property began to be operated, there could be some arrangement made with the taxing authorities by which the complainant could be relieved from paying its lawful taxes. This assumption is certainly not one which can be made by a court; on the contrary, the assumption must be that lawful taxes will be assessed. Mr. Hansel's testimony above referred to will be found at Record pages 4515-6.

We therefore respectfully ask that the item of taxes during construction should be increased, and we urge

that the evidence fully justifies an allowance of $150,000, and does not justify an allowance of less than $128,000.

Estimated Return to be Expected on Complainant's Passenger Property Under the Two-Cent Rate.

Under this heading we desire to renew our claim that the typical year adopted to determine probable future results cannot properly be obtained by using a four years' average of the results of actual operations without taking into consideration the undisputed proof in this case of the increase in wages and prices of material since 1910.

You have, however, found as facts (Report 227-8) "that since 1910 there has been a substantial increase in the rate of wages paid by complainants in almost all classes of labor employed by them; that a large proportion of this increase came from a raise in wages for trainmen, and that this increase is probably permanent"; and that "since 1910 there has been a steady increase in the price of railway supplies generally, and particularly in the prices of ties."

You also say (at p. 227) of the facts thus found: "The facts there alleged are, if true, proper to be given consideration in connection with the general question as to what is to be expected in the future in view of past experience, not only in general, but also and especially in view of the particular experience of the typical year."

In your letter of May 20th you say of the report handed to counsel: "These two parts are intended to cover everything except the question as to what is required to constitute a sufficient rate of return", which question you reserve for consideration until after the objections asked for in that letter have been considered.

We take it, therefore, that due and proper considera-

tion will be given to the question of increase in wages and in prices of material in that article, and that it is unnecessary at the present time to do more than call your attention to our claims.

In this same connection we again raise the question of depreciation not charged as an expense item in the years 1910, 1911, 1912 and 1913. On page 226 of your report you refuse to consider this depreciation in forming your typical year because you say "that complainant has not furnished testimony from which I am able to determine with sufficient definiteness a proper amount for such item."

We believe that in this statement you are in error, and we call your attention to the testimony of Mr. Riggs (Rec. p. 262) in which he sets forth a table of depreciation which he used for bridges, trestles and culverts. His testimony with regard to the propriety of the use of this table is, so far as we know, undisputed in the case, and from it every item of depreciation claimed by us can be calculated, and the manuscript brief of Eldredge and Tracy gives these computations on page 46.

$12,000 Paid President Fitch on His Retirement.

We desire to object to the action of the Master with reference to this item. The undisputed evidence (Rec. 7752) shows that this allowance was an adjustment of salary. You treat it as though it were a gratuity.

It appears that Mr. Fitch was president and general manager for many years. Even if the amount paid him was a gratuity, it was a legitimate item of expense resting in the discretion of the Board of Directors to make, and not subject to review by a court, except upon the ground that any allowance was unjustified. It appears from the evidence in the case that the complainant has no pension system, and certainly the officers of the com-

pany have a right to take this into consideration in dealing with old employes who leave their service.

We quite agree with your conclusion that, treated as an expenditure applicable only to the year in which it was paid, the payment might make the expenses of that year abnormal, but only because payment was to an officer whose salary was presumably among the largest paid by the complainant. If spread over a period of four years, as the average method adopted by you would spread it, we believe it is a proper expense item which should be allowed. We can see no basis for your conclusion that if allowed, it would have to be spread over the entire period of his employment.

Adjustments Made in the Accounts of 1913.

(Report, pages 229-231½, inclusive.)

Assuming that you are correct in your conclusion that the expenses of the year 1913 do not represent the expenses of a normal year, complainant thinks your deductions are too great. The theory upon which these deductions are made you clearly state, viz: that there were expenditures in the year 1913 made to take care of the deferred maintenance of previous years. Assuming this to be true, when you deduct all of the expenses of 1913 for superintendence, ballast, roadway and track, and bridges, trestles and culverts, beyond the average of the three preceding years, the effect must necessarily be to leave the expense accounts of the year 1913 in the same condition as the three previous years,—that is, with too small an amount charged for maintenance. It would seem to us that even upon the theory on which these deductions are made from the expense account of 1913, they should have been only three-fourths as much.

Division of Michigan Passenger Operating Expenses Between Intrastate and Interstate.

(Page 277.)

Under this heading we desire to call attention to the method adopted by you for the division of the accounts, Station Employes, and Station Supplies and Expenses. It seems to us that a division on the relation of the tickets sold at stations would be more logical than the one adopted by you, viz: the relation of the number of passengers traveling inter- and intrastate, respectively, for the reason that the sale of tickets represents, as accurately as is possible, the actual relation of the passengers with station employes, and station supplies and expenses. It excludes from consideration passengers who pay on trains, and passengers from foreign lines who travel on through tickets, which two classes of passengers have little or no dealings with the stations or their employes. If the Master should conclude that the division should be made on the basis here suggested, the data therefor can be found in complainant's Exhibit 85.

Defendants' Objections.

Objection No. 1:

The right is reserved to present to the Court an exception that such report is erroneous in determining and finding, as a matter of law, that the complainant is not estopped, by the acceptance of land grant lands by itself or its predecessors in ownership, from questioning the validity of the Michigan passenger rate statute, fixing rates of fare to be charged upon complainant's railroad of two cents per mile for the carriage of passengers.

Objection No. 2:

Such report is erroneous in its conclusion and finding, as a matter of law, upon the question of the degree or positiveness of proof required, of those contesting a statutory rate of fare, to establish the invalidity of such rate, and in not finding that it is essential that every material question and conclusion, upon which the invalidity of a statutory rate is predicated, be established beyond controversy and beyond the possibility of a reasonable doubt, as well as in numerous instances throughout the report failing to apply the rule that every question throughout the controversy of sufficient materiality and importance, taken separately or cumulatively, as to affect the result, must be resolved in favor of the validity of the rate-fixing statute.

The applicable principle has been enunciated in many cases. It is, that every presumption is to be resolved in favor of the validity of legislative enactments; and rate-fixing statutes form no exception. The effect of this salutary rule has never been permitted to be frittered away by nice distinctions or refinements of reasoning, as is here attempted.

No discretion is vested in the courts in determining whether the Legislature, as a co-ordinate branch of the Government, has exceeded its authority. When positive proof of the exercise of excess authority is produced, then, and then only, can the courts perform their duty of declaring statutes to be unconstitutional. Before that duty arises, or will be performed, it must appear beyond possibility of reasonable doubt that the statute is unconstitutional, and, in order that it may so appear, it must also appear that *every link in the chain of evidence* to show such invalidity is established beyond doubt.

Such invalidity is not permitted to rest upon equivocation or opinion, and where there is doubt on any question or element, that doubt must be resolved to sustain the legislative action. We feel that in a number of instances throughout the case the doubt has not been resolved by the Master in favor of the validity of the statute, but has been resolved in favor of the complainant. A few of the particulars which may be pointed out are the following:

In allowances for the items "Contingencies," "Taxes," "Appreciation," "Working Capital" and "Stores and Supplies."

In refusing to depreciate ballast and track laying and surfacing.

In acceptance of complainant's alterations of defendants' modified revenue train-mile ratio for division of common property and common expenses.

In the determination that decreased rates will not, and did not subsequent to 1907, produce increased traffic.

The character, extent or effect of the presumption of validity does not depend upon proof or inference of the legislative knowledge, or its means of knowledge, or the extent of its investigation; it is a positive presumption that the law is valid unless all conditions which would render it invalid appear absolutely.

In *Chesapeake & Potomac Tel. Co. vs. Manning* (185 U. S. 245), it was said:

> "But it is well settled that the courts always presume that the legislature acts advisedly and with full knowledge of the situation. Such knowledge can be acquired in other ways than by the formal investigation of a committee, and courts cannot inquire how the legislature obtained its knowledge. They must accept its action as that of a body having full

power to act, and only acting when it has acquired sufficient information to justify its action."

In *Calder vs. Michigan* (218 U. S. 598), it was said:

"* * * we do not inquire into the knowledge, negligence, methods or motives of the legislature * * *."

In *United States vs. Des Moines Navigation & Railway* (142 U. S. 544-45), it was said:

"The knowledge and good faith of a legislature are not open to question. It is conclusively presumed that a Legislature acts with full knowledge, and in good faith. It is true the bill alleges that its passage was induced by the navigation company, by false representations and threats of suits; but such an allegation amounts to nothing. In Cooley's Constitutional Limitations (5th ed. 222), the author, citing several cases, observes: 'From what examination has been given to this subject, it appears that whether a statute is constitutional or not is always a question of power; that is, a question whether the legislature in the particular case, in respect to the subject matter of the act, the manner in which its object is to be accomplished and the mode of enacting it, has kept within the constitutional limits and observed the constitutional conditions. In any case in which this question is answered in the affirmative, the courts are not at liberty to inquire into the proper exercise of the power. They must assume that legislative discretion has been properly exercised. If evidence was required, it must be supposed that it was before the legislature when the act was passed; and if any special finding was required to warrant the passage of the special act, it would seem that the passage of the act itself might be held to be

equivalent to such finding. And, although it has sometimes been urged at the bar that the courts ought to inquire into the motives of the legislature where fraud and corruption were alleged, and annul their action if the allegations were established, the argument has in no case been acceded to by the judiciary, and they have never allowed the inquiry to be entered upon."

In *San Diego Land & Town Co. vs. National City* (174 U. S. 754), it was said:

"But it should also be remembered that the judiciary ought not to interfere with the collection of rates established under legislative sanction, unless they are so plainly and palpably unreasonable as to make their enforcement equivalent to the taking of property for public use without such compensation as under all the circumstances is just, both to the owner and to the public; that is, judicial interference should never occur unless the case presents, clearly and beyond all doubt, such a flagrant attack upon the rights of property under the guise of regulations, as to compel the Court to say that the rates prescribed will necessarily have the effect to deny just compensation for private property taken for the public use."

Louisville vs. Cumberland Tel. & Tel. Co., 225 U. S. 430-36.

Knoxville Water Co. vs. Knoxville, 212 U. S. 16-17.

Willcox vs. Consolidated Gas Co., 212 U. S. 19, 41, 54.

Louisiana Ry. Com. vs. Tel. & Tel. Co., 212 U. S. 414, 423, 425-28.

Chicago, Milwaukee & St. Paul vs. Tompkins, 176 U. S. 167.

Cotting vs. Kansas City Stock Yards, 183 U. S. 79.
Capital City Gas Co. vs. Des Moines, 72 Fed. 829.
Ruggles vs. Illinois, 108 U. S. 526.
Atlantic & Pacific vs. United States, 76 Fed. 186.
Ex Parte Koehler, 23 Fed. 529.
Matthews vs. Board of Com. of North Carolina, 106 Fed. 7.
Spring Valley Waterworks vs. San Francisco, 124 Fed. 574.
Minneapolis & St. Louis vs. Minnesota, 186 U. S. 257.
In re Arkansas Rate Cases, 187 Fed. 317, 353.
St. Louis & San Francisco vs. Hadley, 168 Fed. 317, 353.
San Diego Land & Town Co. vs. National City, 174 U. S. 739.
Southern Pacific vs. Campbell, 189 Fed. 182, 184.
Louisville & Nashville vs. Railroad Commission, 208 Fed. 42.
Minneapolis Gas Light Co. vs. Minneapolis, 123 Minn. 231; 143 N. W. 728, 732.
Commonwealth vs. Boston St. Ry., 212 Mass. 82, 85-86.
Central of Georgia vs. McLendon, 157 Fed. 975.
Spring Valley Waterworks vs. San Francisco, 192 Fed. 144.
Montana, Wyoming & Southern vs. Morley, 198 Fed. 999.

The argument by which the Master seeks to predicate his ruling on this point, upon things inferentially determined or not determined by the Legislature, is contrary to the above cases, as, in fixing the two-cent rate, the Legislature of necessity conclusively passed upon and determined every question essential to be considered. While its determination is not final, it is accompanied with

every presumption of validity, until an affirmative showing which excludes every possibility of doubt indicates it to be otherwise.

In order to sustain the legislation, the courts will even go so far as to speculate upon the existence of things which will operate to sustain its validity, and, where there is a possibility of certain conditions existing which will make a statute valid, they will assume those conditions to exist, and that the Legislature predicated its action thereon.

Missouri, Kansas and Texas vs. May, 194, U. S. 269.

In the inception of rate legislation, and for a number of years, the Federal Supreme Court regarded the legislative determination of the sufficiency of a rate to be final. This rule was reluctantly abandoned so as to permit of review by the courts where there was no return. Subsequently the courts assumed authority to determine whether the return was adequate, but, throughout the history of rate legislation, the Supreme Court has adhered to the principle that no rate should be set aside until clearly proven insufficient, and that all doubts must be resolved in favor of validity.

Objection No. 3:

Such report is erroneous in its findings and conclusion, as a matter of law, that the cost-of-reproduction value less depreciation, or the "replacement-cost value," is to be taken as the absolute measure of the value which must be sustained by the rates permitted to be charged.

Not only the leading case of *Smyth vs. Ames* (169 U. S. 546-47), but practically every rate case, to the present, recognizes that no single element or rule of valuation is

to be applied in determining the value of the property which must be supported by rates, and that all that the company is entitled to ask is a fair return on that which its employs for the public convenience. Value is not determined by replacement cost, though that may be a consideration in determining what is fair to the public and the utility, in the light of the rule that the interests of both must be considered.

Objection No. 4:

Such report is erroneous in its findings and conclusion, as a matter of law, that the cost-of-reproduction value upon which the complainant is entitled to a return can exceed, or does exceed the commercial value of the property, or the value or price at which the public could acquire full title to such property under the exercise of the right of eminent domain.

The utility is entitled to a return upon the value of that which it employs for the public. That value cannot be influenced down by the regulated rates being tested, nor up by the previous rates charged by the utility. Where, however, commercial value is indicated under rates which the utility has accepted, it cannot by reason of a high replacement cost claim a return, when testing the sufficiency of particular rates, upon an amount greater than the commercial value under rates *accepted* by it. The commercial value under the rates which the company *accepted* was admitted, and claimed by the complainant in its reports for taxation, to be not greater than $11,144,946 in 1913, and no so-called replacement cost, built up on the assumption of reproduction, can entitle complainant to a return from its passenger business on more than a proper proportion of its admitted commercial value.

As has been before pointed out, the property might be acquired for public use, by proceedings *in invitum*, at

its commercial value, and, if complainant is secured a return upon the passenger proportion of that value by the two-cent rate, it has no legal cause for complaint.

Objection No. 5:

Such report is erroneous in its conclusions and findings of law and fact, in that the value of the complainant's property in Michigan, as adopted by the Master, is excessive and is greater than its actual value, and is greater than the value thereof that the complainant is entitled to have supported by the statutory rates of charge. Such excessive and erroneous value is due to the following considerations:

(a) In arriving at, and in fixing, such values for real estate and right of way, the Master has included improper values, and improper elements of value, as follows, to-wit:

(1) The strategic or special value attributed to certain lands on account of their claimed adaptation for railroad purposes.

(2) The riparian or other water rights which are claimed to be appurtenant to the lands of the complainant at St. Ignace, Marquette and Houghton, so far as such riparian and water rights are not in actual railroad use.

(3) The trackage rights existing in streets in the cities of Marquette and Ishpeming.

(4) Mineral and ore values in and under the right of way, and speculative values due to the possibility of discovery of minerals under the right of way.

(5) Land values, generally, which are excessive and contrary to the weight of evidence.

(6) The reliance upon testimony of witnesses

placing high values, and refusal to take the testimony of witnesses entitled to credit and equally well qualified to fix values, whose values were well considered, and who fixed lower values, and the refusal to apply proven tests of the correctness or incorrectness of opinion evidence of value, which tests show the values taken and used by the Master to be too high.

(7) The refusal to take into account, or be influenced by, values as fixed by actual purchase and sale of similar nearby and adjacent lands.

(8) The addition of values for clearing and grubbing, which brings the values of the complainant's lands above the values of similar cleared lands nearby and adjacent.

(b) In arriving at and fixing such values for real estate and right of way, the Master has proceeded upon erroneous and improper methods of valuation, in that:

(1) Lands in considerable or large tracts are considered and valued upon the basis of adjacent or nearby lands subdivided into small lots, and upon the basis of an immediate sale of the whole of such lands at the values or prices which were paid for a small number of lots out of a large number in the vicinity.

(2) The assumption is given effect, that there would be an immediate demand, at high prices, for all of the South Shore lands now occupied by the railroad.

(3) The detrimental effect of the railroad, as giving a lower value to lands in its immediate vicinity for other than railroad purposes, was not taken into account, in that the railroad lands were considered of the same value as, and compared with, residence and high-class business property located in the better parts of municipalities where those lands lay.

(4) Principal and important streets in municipalities were assumed to be projected through and on to the land of the complainant, and the further assumption was placed that there would be an immediate demand for all the railroad lands thus assumed to be on such streets, for the same uses as the occupied lands now on such streets or in the vicinity.

(5) Values which are based upon purchases for railway purposes are accepted, resulting in the inclusion of the values and elements of value for railway purposes forbidden under the *Minnesota Rate Cases.*

(c) In valuing the property of the complainant, the Master placed thereon high and excessive values, in this, that:

(1) He found the total value of the lands of the complainant in Michigan to be $1,780,239, whereas the true value, and the value proper for use in a rate case, was, and is, much less, excessive values being placed upon the lands in each of the counties of Chippewa, Mackinaw, Schoolcraft, Marquette, Baraga, Houghton, Ontonagon and Gogebic.

(2) He valued the trackage rights in streets (erroneously included) at much in excess of the cost to produce, or to reproduce, and in excess of any value therein belonging to the complainant.

(3) He assumed that to reproduce the earth grading upon the complainant's line and right of way would cost thirty cents per cubic yard, whereas the true cost to reproduce, and the real production value, is much less, and does not exceed an average of twenty-five cents per yard.

The price adopted for grading is higher than prices paid by the South Shore on its line in recent years, and

higher than that shown by the majority of bids on 25 miles to be constructed for the Chicago, Milwaukee and St. Paul in the vicinity.

---

(4) He finds a unit price for ties of forty cents each, notwithstanding the records and reports of the complainant to public boards in Michigan show tie prices to be considerably less, and notwithstanding the actual purchase price and value of ties is less than forty cents each.

Riggs first used a tie price of 34.77 cents per tie. When Hansel erroneously used forty cents per tie, Riggs increased his estimate to forty cents. That price involved a duplication of the cost of transportation, inspection and loading, as the average of tie prices reported to the State for five years (1909-1913), and used by Riggs as his base price, included those items and was 31.39 cents.

Riggs' price, as figured by himself, after adding for, and thus duplicating charges for, transportation, inspection and loading, was less than forty cents; this he increased to forty cents on the assumption that, assuming reproduction, the demand for ties in the community would so increase as to raise the price to forty cents.

His use of a simple average was also improper, as giving undue weight to the lesser number of high-priced ties purchased.

---

(5) He incorrectly applies the unit prices and depreciation percentages which he adopts for rail to the rail existing in complainant's line, with the result that he erroneously fixes a value for this item

of $1,193,882., instead of $1,170,995., which is the result of correct application of the prices for rail and of the method of determining depreciation which he adopts.

(6) Notwithstanding that the weight of the evidence shows that ballast depreciates and that it must be renewed and replaced from time to time, to keep it in 100 per cent condition, he refuses to allow for the depreciation of that item, and finds and determines that there is no depreciation in it.

All the witnesses who testified upon the subject of depreciation of ballast—seven in number—admitted or testified that ballast does in fact depreciate and must be renewed (Defendants' printed Brief, p. 44). That ballast deteriorates cannot be gainsaid; that this deterioration is depreciation in value is the self-evident result of the fact that expenditures must be made to restore the condition to 100 per cent.

No argument can change the admitted fact that when ballast is newly placed it is in 100 per cent condition, and that thereafter it deteriorates as ballast, and the time comes when expenditures must be made to restore it to 100 per cent condition. Whether the falling off of value or serviceability is called depreciation or not, a deduction from value, to represent present condition, must be made, or the appraisal does not accord with the facts.

---

(7) He adopts as the price and value, or cost of reproduction, of the item "Tracklaying and Surfacing," $600 per mile, whereas the real value, or cost of reproduction, of that item is not shown to be in excess of $526 per mile on complainant's railroad.

(8) He does not depreciate the item "Track Laying and Surfacing," although the same does depreciate and exists in the complainant's railroad in a depreciated condition, and although the track structure, made up of ties, rails, frog switches and crossings, track fastenings, and track laying and surfacing, as a whole does depreciate, and the track laying and surfacing does depreciate in like proportion as do the other items of the track structure.

"Track Laying and Surfacing" is not a separate article or item of property. It is the labor portion of the track structure, above the grade. This track structure is made up of ballast, rails, track fastenings, frog switches and crossings, ties, and track laying and surfacing, united, in the same way a bridge is made up of the timber, ties, iron and steel, and labor which unites in forming the bridge.

The mere fact that the item "Track Laying and Surfacing" is separated in inventory, for the purpose of applying a unit price, does not so separate it from the track structure of which it forms a part as to relieve it from the depreciation which occurs in the track structure.

To the same extent that any item of property depreciates, so the labor which created it depreciates, and the rule here sought to be applied, by separating the labor from the material, is an exception to all human experience. Track laying and surfacing exists only as a part of the structure created, and as the structure created disappears or depreciates, so must the track laying and surfacing, which is only found in the assembly of items of the track structure, depreciate or disappear with the property in which it is found. It is, and must be, admit-

ted that the making good of depreciation in ballast, rails, ties, etc., requires also a renewal of the labor entering into the original laying and surfacing of the line.

The warning which the Master urges upon counsel, in the third paragraph on page 163 of his report, regarding "Contingencies," may well be taken into account when considering this account, as it is evident that depreciation on this item is denied solely because of its being treated, for purposes of convenience, as a separate item of appraisal.

---

(9) In the item "Sidetracks" he neglects to deduct the turnouts which are already included, in whole or in part, in the valuation of the through main track, thus causing a duplication of property included in the appraisal, which said item of turnouts the witness, Riggs, for complainant, testified should be deducted, in the number of 1,630, at $18 per turnout in 60 per cent condition.

(10) In reference to the item "Engineering on Roadway and Structures," the Master states that he deducts $20,000 as fixed by Hansel for cost of acquiring land, whereas his computation, as finally completed, still carries the Hansel total of $255,000.

(11) In arriving at the value of the item "Locomotives," and the proportion thereof to be attributed to the passenger business in Michigan, the Master erroneously divides the portion thereof attributed to the non-revenue mileage between passenger and freight on the basis of 46.98 per cent passenger, whereas such non-revenue locomotive mileage is made in serving the property and should be divided upon the basis in which the property is allocated and assigned to the different services, or on the ratio

of the "Maintenance of Way and Structures" expenses in the different services, namely, not greater than 30.7 per cent to passenger.

Locomotive No. 43 is included in the valuation, although not in use since 1911, when it made but 135 miles in freight service, and the entire value thereof is attributed to the passenger business, whereas, due to the fact that its last operations were in the freight service, it should be entirely attributed to the freight service.

(12) In the item "Passenger-train Cars," the Master erroneously attributes to the Michigan Passenger business too large a proportion of the value, by using a basis of apportionment which assumes a certain train consist and apportions the value of the cars in such train upon the basis of their mileage in each state, which method of apportionment assigns to Michigan all reserve cars, and does not assign to Wisconsin cars which are extra to the assumed train consists, or which are used in special or excursion trains, or substitute cars which are used in case of failure of any car regularly in service in Wisconsin. Such apportionment is erroneous, in not dividing such passenger-train cars (excluding official cars, sleepers and diners) on the basis of car-mileage of D., S. S. & A. passenger-train cars in the respective states. Of the value of the sleepers and diners, an insufficient proportion was assigned to Wisconsin and too great a proportion to Michigan.

(13) Said value is improperly increased and enlarged by the allowance of a constructive percentage of two per cent as "Engineering on Equipment."

The larger part of the present equipment was added during operation. There is no shown cost or expense for engineering thereon. If there was any such cost, it has been charged in operating expenses, and, under *Louisiana Railroad Commission vs. Cumberland Telephone Co.* (212 U. S. 423-25), it cannot be included in the value to be supported by rates.

---

(14) He adds, on account of the item "Contingencies," the sum of $400,000, without sufficient proof that contingencies in that amount, or in any amount, exist in the value of the property or would inevitably occur in a reconstruction, or were incurred and paid for in the construction of the property.

Contingencies may occur which will vary the estimated cost, up or down. Whether the variation will be up or down is uncertain and depends on the accuracy of the estimate. In the present case there is no room for uncertainty which requires additions of estimated amounts to cover a cost which may or may not occur. Rate-fixing statutes are not declared invalid upon probabilities of value, but upon proven existing values only. In the very nature of the item, which is at best but a probability of value, is found the reason for its exclusion from value in testing the validity of a rate-fixing statute, where it is predicated upon a complete and careful inventory. The language of the Court in the *Ann Arbor Rate Case* upon this item is, in general, equally applicable in this case. That language follows:

"* * * But the evidence in the present case furnishes no warrant or justification for an allowance for contingencies. Contingencies are said to be

of two kinds: those of inventory and those of construction. In these days of highly systematized work there is little chance of omissions in inventory and, while in theory this railroad is to be reconstructed, in fact it is already built and in operation and there can be no unknown contingencies of construction. Moreover, costs of construction which make up plaintiff's valuations have been fixed at top prices charged by contractors and builders who assume all the risks of contingent losses. Ties are valued from ten to twenty-five per cent higher than the actual cost to this company. The cost of grading and track laying is figured upon the basis of contract prices from ten to thirty per cent greater than those prevailing even in these days of high prices. In fact, each item or class of property has been valued sufficiently high to include a safe and sufficient margin for contingencies and no sound reason exists for the allowance of an additional lump sum to cover improbable losses."

---

(15) He allowed and included in the value of complainant's property, on account of the item "Legal Expenses during Construction," the sum of $51,400, whereas the weight of evidence indicates that the allowance therefor should not exceed $25,000.

It seems apparent that less would be spent for legal expenses during the period of construction than during a similar period of operation. Riggs so testified. Computed upon that basis, the allowance for legal expenses would be less than $25,000.

(16) The amount allowed by the Master as "Interest during Construction" is more than any proportion of the value of complainant's road attributable thereto, is greater than any amount shown to have been expended on account thereof by complainant out of capital, and is greater than any amount which would be expended in case of reproduction.

Interest during construction is computed upon items shown in Exhibit 1 (p. 2) to be included in the inventory at actual cost.

(17) The allowance by the Master of $100,000, on account of the item "Taxes during Construction," is improper, as there is no proof that taxes would be paid, or of the amount that would be paid, in case of reconstruction, or what was actually paid during construction, because, during the period of construction of complainant's railroad, taxes were imposed upon gross earnings of railroads, while the property was exempted.

Complainant claimed nothing for taxes during construction. The only witness testifying with regard thereto was Hansel, who allowed $50,000 on property other than real estate.

The allowance of any amount is purely speculative, as there is no shown practice to tax uncompleted railroads in Michigan, nor showing of what would be the basis of the assessment.

---

(18) Allowances and additions by the Master, on account of the items "Working Capital" and "Stores and Supplies," are excessive, in that the amount allowed for stores and supplies is amply sufficient for both of such items.

(19) The amounts allowed for depreciation upon various of the elements or items of the property are insufficient.

(20) The amount of $300,000 added to the appraisal on account of "Appreciation" is not sustained by the evidence. The existence of any appreciation in the roadbed of the complainant which would increase its condition above 100 per cent of the roadbed, as inventoried and included in the appraisal, is not proven, and there is no proof from which it is possible to draw a conclusion or to make a finding to the effect that appreciation to the extent of $300,000, or any other amount, exists in the complainant's railroad.

A value for appreciation, if properly allowable and to be added, is improperly proportioned between services, as, if it exists, it would attach to the property in the proportions in which the roadbed under *all* tracks is assigned to the respective services.

There was, and would be, no cost to the complainant for this item, other than the amount which was, and would be, included in, and paid for out of, operating expenses.

Nothing was included in any inventory for appreciation. No notice or intimation was given of a purpose to claim or add for it, until the argument. The only sustaining testimony is that given to justify carrying grading undepreciated, at 100 per cent. The sole testimony upon which even a speculation as to its value might be made (occurring on Record pp. 249-50), was adduced for distinctly another purpose. Of almost identical testimony, given by the same and other witnesses in the *Ann Arbor Rate Case* with the declared purpose of making an addition for appreciation, the Court said:

"Counsel for plaintiff also insist and the evidence indicates that the roadbed of a railroad appreciates in value, at least during the first few years after construction. The grade becomes more compact and solid with age and use and the slopes of the grade and the ditches become covered with vegetation which tends to prevent erosion. However, no allowance is made for such appreciation in any of plaintiff's schedules or computations and there is no evidence from which the value of such appreciation can be determined with any degree of certainty. It is true that one witness testified that a larger number of section men are required to keep in condition a new railroad than an old one. This may be owing to the fact that a new railroad is seldom in a normally perfect condition of completion at the beginning of its operation. At any rate, this testimony does not furnish a sound basis for the allowance of additional values."

The argument we presented on this question (Defendants' typewritten Brief, pp. 136-46) was conclusive against its allowance. The testimony of greater cost during the first few years, upon which the Master bases his finding of its value, is not upon, but beside, the question, as the requirement of extra section men was expressly stated to be:

" • • • to take care of the work of cleaning out of cuts and of replacing earth around embankments that had sunk down or been washed away."

The extra work, and the charge therefor, was, under this statement, to keep the grade in 100 per cent condition. To cover these expenditures, Riggs had added 17.5 per cent to grading.

Objection No. 6:

Such report is erroneous, in that it finds the value of the property of the complainant attributed to, and which is required to be supported by, the Michigan passenger business, to exist in too great an amount and value, due to the fact that he makes no deduction therefrom for property created or paid for out of operating expenses; that the amounts of property created out of operating expenses are indicated by the testimony to be large, and that it was incumbent upon the complainant to show the amounts thereof, in order that they might be deducted from the value to be sustained by rates, and, in the absence of such proof, no finding of a value of complainant's property which should be supported by rates was, or is, possible.

Objection No. 7:

Said report is erroneous in finding and setting off to exclusive freight trackage, as the expenses attributable thereto, an insufficient amount, in that:

(a) Nothing is set off to the exclusive freight main line trackage of 13.06 miles.

(b) It is assumed that the cost of maintenance of exclusive freight trackage is but one-third of the cost of maintenance of main line trackage, per mile of track, whereas the weight of the evidence shows that the cost of maintaining exclusive freight trackage, in proportion to the cost of maintaining main line trackage, is greater than one-third, and that the exclusive freight trackage maintenance expense should have been set off on the basis of its maintenance cost being two-fifths to one-half as much per track mile as the cost to maintain a mile of main line track.

(c) In setting off the expenses attributable to exclusive trackage, only those maintenance expenses classified under the general account "Maintenance of Way and Structures" were divided so that the exclusive trackage would bear, and be charged with, a proportion thereof, whereas a proportion of the expenses under the other general accounts should have been set off in the method used and applied by the defendants.

(d) No account was taken of the undisputed testimony, that freight spurs and sidings are entirely changed in position and must be removed and rebuilt at least once in each fifteen years.

The equation of three to one, as applied to the cost of maintenance of exclusive freight trackage, does not set off the proper amount for exclusive main line trackage, for which there should be no equation. Of such mileage there are 8.83 miles of the south track, Eagle Mills to Winthrop Junction, 2 miles of the Republic Branch, and 2.23 miles of the Bessemer Branch, or a total of 13.06 miles. The expense of maintenance of this should be set off to the exclusive freight spurs at the amount found for main line mileage by complainant, of $1,151.14 per mile, or an aggregate of $15,033.89. Neither complainant nor the Master has made allocation to freight on this account.

The equation of three to one, in setting off the exclusive freight tracks other than ore and industrial spurs, does not set off a sufficient amount, as the weight of evidence shows the equation should be on a basis of not less than one to three and not more than one to two, or an average of two to five. That this is conservative in complainant's favor is indicated by the evidence:

Riggs,	from as 2 is to 1, to as 2½	is to 1	(R. pp. 4193-96)
Young,	from as 2 is to 1, to as 3	is to 1	(R. pp. 8266-70)
Lytle,	from as 2 is to 1, to as 3	is to 1	(R. pp. 8242-43)
Lindsay,	from as 2 is to 1		(R. pp. 10115)
Delf,	as 3	is to 1	(R. pp. 3587-88)

Applying the modification to 2 to 3 would increase the allocation of expenses to exclusive freight tracks by above $6,450.

Thompson made this equation to set off exclusive track, on the proportion of three to one, relying upon the testimony of Delf. He testified to no independent knowledge upon that particular subject. The further testimony indicating a different equation was given after Thompson used Delf's proportion.

It is apparent that there should be set off to the exclusive trackage a part of the expense of maintenance of equipment under "Work Equipment—Repairs," "Work Equipment—Renewals" and "Work Equipment—Depreciation," as this equipment is used in maintaining that trackage, and the same principle which has induced the Master to divide the similar items of property as overhead would require a part of these items to be attributed to exclusive trackage. The four-year average to be set off would be above $1,200.

Under "Transportation Expenses," the items "Superintendence," "Dispatching Trains," and "Stationary and Printing" are, in part, incurred for exclusive trackage, and a proportion of each of these items should be set off to exclusive track. This, using a four-year average, will be above $5,000.

Objection No. 8:

Such report, and the conclusion and findings thereof, are erroneous in failing to find, and deduct from the

value of complainant's property to be supported by rates, as claimed by defendants, the value of property used by the complainant, and included in the inventory, which was contributed to complainant by the public for rail road use.

Objection No. 9:

Such report, and its conclusions and findings, are erroneous in allocating property between services and states, in that:

(a) Passenger stations, at points where there is no exclusive freight building, or where the common agent makes his office in the passenger station and it is essential that the public doing freight business with the road use the so-called passenger station, are assigned in too large a proportion to passenger business, with insufficient separation to freight business.

(b) An insufficient part of the Marquette station and grounds is assigned to common and freight business, and no part of them is assigned to the Wisconsin business.

Objection No. 10:

Said report, and its conclusions and findings, in the divisions between services of property commonly used in passenger and freight services, are erroneous, in the particulars that:

(a) Neither the basis of the time of use by the respective services, as proposed by the defendants, nor the alternative basis, using the modified revenue train-mile ratio, as computed by the defendants, was used.

(b) The amended modified revenue train-mile ratio, as adopted by the Master, is erroneous, as it

attributes to passenger business a greater amount, volume and value of property, and to the freight business a lesser amount, volume and value of property, than is used by them respectively. The errors therein are in the particulars that:

(1) It does not give effect to the time, value or amount of use by the respective services.

(2) The modified revenue train-mile ratio used by the Master is built up upon a percentage of the time of freight trains engaged in stational service which is less than the actual percentage mathematically computed from the actual time of freight trains spent in stational service as shown in the testimony, the percentage used being 32.2 per cent, and the correct percentage being 36 per cent.

(3) In computing such ratio, it was assumed that a portion of the stational time of freight trains represented by the 32.2 per cent stational time used by the Master is idle time, whereas, in fact, freight trains are, during all of the stational time, using the property.

(4) In the elimination from the percentage of the time of freight trains engaged in stational service of the part of their time spent on exclusive freight track, too large an amount of time is deducted, due to the use of too great a mileage of exclusive freight track and of too small a mileage of common track, and to the assumption that the volume of use or stational time spent on the tracks, per track mile, is the same for both common and exclusive tracks.

(5) In dividing the statistical switching mileage of complainant between the passenger and

freight business for addition to the train mileage to reach the modified train-mile ratio, too great an amount of switching mileage is attributed to exclusive, and too small an amount to common, tracks.

(6) In arriving at the modified revenue train-mile ratio which the Master uses, the applicable presumptions of law are reversed by him, and, instead of resolving the doubts in favor of validity of the statute and rate, he has resolved doubtful questions against the sufficiency of the rates.

(7) The division of property between passenger and freight services, as made by the Master, is dependent solely upon opinion, without adequate supporting data.

(8) The deductions and recomputations by which the complainant alters defendants' modified revenue train-mile ratio, which deductions and recomputations are accepted by the Master, depend largely on the assumption of unproven conditions, on which there is no testimony; the assumptions without evidence being:

That 15 per cent of the time of freight trains engaged in stational service is idle.

That stational service occurs in equal volume on exclusive and on common tracks.

That the statistical switching mileage is made on exclusive track in the same relative proportion per track mile as it is made on common track.

No method for the apportionment of common property and expenses between passenger and freight reaches pre-

cise accuracy. The degree of variation of any ratio for this division from the precise truth is uncertain; the variation from the truth may be ten or even twenty-five per cent.

The revenue train-mile ratio, as modified by the respective parties, fixes no division of common expenses known to be exact; it still contains an uncertain amount of uncertainty. If in this instance either ratio reaches precise results, it is because the accidental results of certain related, though not controlling, facts in the particular case produce that effect, and not because of certainty of the rule adopted.

Complainant is insistent on its method of modification, which produces a passenger ratio of 42.48 per cent. Defendants are equally insistent on their modification, which produces a passenger ratio of 38.06 per cent. The difference is but 4.42 points.

Complainant's modification is dependent on several important but unproven assumptions, the specific proof upon which might so vary its percentage as to reduce it almost, if not quite, to defendants' ratio.

Under these circumstances, we doubt if the Master can, consistently with the testimony, or with the rules which require opinions as opposed to the validity of a rate to be taken with caution, or with the rules which require the error, if any be made, to be on the side of certainty, and those which require all doubts to be resolved in favor of the validity of the rate, find that the modified revenue train-mile ratio as now claimed by complainant represents the truth or the point nearest to the truth.

In the *Missouri Rate Case* (230 U. S. 507), it was said:

> " • • • in an issue of this character involving the constitutional validity of state action, general estimates of the sort here submitted with re-

spect to a subject so intricate and important should not be accepted as adequate proof to sustain a finding of confiscation."

In the *Minnesota Rate Case* (230 U. S. 466), it was said:

"• • • the company having assailed the constitutionality of the state acts and orders was bound to establish its case, and it was not entitled to rest on expressions of judgment when it had it in its power to present accurate data which would permit the court to draw the right conclusion."

In the *Arkansas Rate Cases* (230 U. S. 560), it was said:

"• • • It was not sufficient for the complainants to criticise the tests relied upon by the defendants, but in seeking to override the action of the State upon constitutional grounds it was incumbent upon them to establish the invalidating facts by definite and convincing proof."

The possibility of error as against the validity of rates must be guarded against, and where two ratios to represent the same thing are presented, that one which beyond doubt will not unduly burden the passenger business must be taken, unless there are proven and stronger reasons which indicate that the other ratio does not too greatly burden the passenger business.

Under the circumstances, and due to the fact that complainant's ratio is dependent on unproven assumptions made the basis of steps in computation, it seems obvious that defendants' modification, as here made, is to be taken.

Defendants, while insistent that their ratio of 38.06 per cent represents the greatest amount of property and expenses which could be charged against the passenger

business, feel certain that due deliberation on the part of the Master will indicate to him that the highest possible percentage for passenger will be not greater than a point half-way between the ratios of complainant and defendants. This makes a reasonable adjustment for the claims of complainant, although we deny that any adjustment should be made for claims, the working out of which depends upon assumption and not upon proof.

Assume for the moment that the entire solution of the case depended upon which of these ratios is adopted; that, complainant's ratio being adopted, the rate is defeated; that, defendants' ratio being adopted, the rate is sustained; in such a situation, would the Master or any court be warranted in basing the decision on the complainant's ratio, which depends on unproven assumptions?

Due to the fact that neither ratio is known to fix exact results, that the difference between them is small, that the duty is to susain the statute if possible, that doubts must be resolved in favor of validity, and that the presumptions are all of validity, it would follow, in such a situation, that the ratio most favorable to the passenger business must be adopted.

We think it clear that the Master should revise his modified revenue train-mile ratio.

(The above discussion applies also to Objection No. 19.)

Objection No. 11:

The defendants reserve the right to present an exception that such report is erroneous in its finding and determination that the gross passenger income for the four years, 1910-1913, is to be taken and used for testing the validity of the statute, instead of the gross passenger income for 1913.

Objection No. 12:

Exception is made, and objection taken, to the failure to find and use the average value of the complainant's property in use in its railroad business for the four years (1910-1913) for which the income and expenses are averaged and used.

The Master says (p. 226):

> "If the four-year average is to be taken for any purpose it must be taken for all purposes."

Objection No. 13:

The defendants reserve the right to present to the Court an exception to so much of said report as apparently determine a public utility, whose property is kept on a fixed or rising level of condition from year to year out of operating expenses, to be entitled to reduce the net income by a charge for annual depreciation, particularly in view of the evidence which shows the condition of complainant's railroad, in 1912 and 1913, was improved out of operating expenses.

No annual depreciation can be charged unless it exists in fact. If, during a particular year or series of years, the property as a whole is in the same or a higher percentage of physical condition than in the previous year or series of years, which is the situation of complainant's railroad, there has been no depreciation, and none can be charged.

The Master's argument fails to differentiate between a single structure and a property made up of a myriad of items which are undergoing constant change, being decayed and worn out, particular items from time to time being replaced *in toto*, while still others are repaired. If, treated as a composite structure, the same percentage

of condition in the entire line is maintained out of operating expenses, no chargeable depreciation accrues. The error is in assuming a structure with limited life, which would eventually depreciate to nothing and disappear, instead of using the existing fact of a composite structure made up of the entire railroad, whose life is perpetual because of maintenance of condition by operating expenses.

When a particular structure disappears, operating expenses replace it with a new structure of the same kind, and the result is to raise, or to keep constant, the level of condition of the composite structure of the entire railroad, though other individual structures may in the meantime run down in condition.

Objection No. 14:

The right is reserved to present an exception to the Court that said report is erroneous in the statement and conclusion that:

> "if the tie prices paid in 1913 had been in effect in the three preceding years and if in each of the four years a proper charge had been made for annual depreciation on the bridges, trestles, and culverts on complainant's road in Michigan, to say nothing of depreciation on buildings and other property, which depreciation I have not attempted to compute, the average Michigan operating expenses of those years would have been increased by $70,159; the average Michigan passenger operating expenses would have been increased by $21,769, and the average Michigan intrastate passenger expenses would have been increased and therefore the average Michigan intrastate passenger net income reduced by $13,346."

Objection No. 15:

The defendants reserve the right to object to the final report, in that the amounts deducted from the operating expenses of 1913, to eliminate abnormal expenditures, expenditures for additions and betterments, and expenditures for deferred maintenance, to reduce the expenses in that year to a normal amount, are insufficient, and that, after the elimination of the amounts deducted, the expenses of 1913, as used by the Master, are still abnormally high.

Objection No. 16:

Said report, and its conclusions and findings, are erroneous, as the operation of sleepers and diners is not eliminated from the operations of carrying passengers at two cents per mile, and there is not eliminated, as part of such outside operations, not only the added (or "out of pocket") costs by reason of doing such business, but also a proper proportion of all costs attributable thereto.

The statutory rate must stand upon its own bottom. It cannot be called upon to bear the burden of, or be made profitable or unprofitable by combining it with, optional operations. Where optional operations are added, they must bear their proportion of the total cost, and be charged with their proportion of the property used.

The Legislature required passenger carriage at two cents per mile, and complainant will not be permitted to say it cannot carry at that rate because it adds to the service furnished, or to the operations carried on, other optional facilities.

In the *Dakota Coal Case* (236 U. S. 596), the Court determined each branch of the service should bear its full proportion of all costs, which is the doctrine we have

contended for, for this item, throughout; and in the *Ann Arbor Rate Case* the Court, in setting off expenses of outside operations, including sleepers and diners, applied the percentages of separation to all costs.

The fundamental principles applicable in the performance by the courts of the duty to review legislative action, to determine whether it meets constitutional requirements, render it imperative that the legislative action shall not be determined to exceed constitutional limitations until every possible influence which might affect the validity of the statute be analyzed and resolved in favor of the validity of the statute. That principle requires, when a certain rate is being tested, that the costs for such service be separated from all other costs, before the legislative action is overruled.

Every reason requiring a proportion of all costs to be attributed to the business being tested, in determining the sufficiency of the rate regulated, also applies in determining the cost of service eliminated. The arguments on this question in our Printed Brief (pp. 241-48) are clear, and should be convincing.

Objection No. 17:

Said report, and its conclusions and findings, are erroneous, in that the amount set apart and used as the revenue to support the property used in the passenger business is deficient in the particulars that:

(a) The revenue from passengers over the Mackinaw Transportation Company's boats are not included (to include the revenues would also require restoring of the passenger proportion of the property).

(b) If sleeper and diner operations are permitted to remain as part of the passenger operations of

complainant in determining the sufficiency of the two-cent statutory rate, then the earnings of such operations, claimed by the defendants to be $8,066.69, or at least $3,989. thereof, should be included in the Michigan earnings, instead of the earnings of $725.32 claimed by complainant and included by the Master.

We are unable to reconcile the determination of the Master to retain the Soo bridge and Soo station as part of complainant's operations and the sleeper and diner operations as part of its passenger operations, and to eliminate the passenger operations and net passenger earnings over the Mackinaw Transportation Company. Consistency would exclude or include both.

The income from D., S. S. & A. passengers over the Mackinaw Transportation Company is received by it as earnings, though being used in reduction of its loss in the freight operations of the ferry. These passenger operations, for the convenience of passengers, of necessity result in stimulating passenger traffic and should not be eliminated unless the sleeper and diner operations are also eliminated.

The use of complainant's cars in the ferry operations, together with the cost of switching to and from the boats, should be charged against the net proceeds from passengers over the ferry.

On page 263 of his report, the Master states that complainant, whose results he accepts, "assigned to Michigan the revenues of all dining cars operating exclusively in Michigan." Our objection to this is that we have been unable to find in the Record any proof of such assignment, and do not believe there is such proof. In the absence of such proof, such revenues are properly divided on the basis used by defendants, namely, the revenues from passengers in the respective states.

The expenses of both sleepers and diners were divided between states by complainant on the basis of the mileage of all cars of the class in the respective states, and by defendants on the basis of the mileage of *D., S. S. & A.* cars of each class in the respective states. The expense divided arises on the operation of D., S. S. & A. cars, and not on the operation of sleepers and diners of other companies. The mileage of sleepers and diners of other companies cannot, therefore, enter into the apportionment of expenses.

The divisions of both revenues and expenses, as made by defendants, are therefore the more proper.

Inasmuch, however, as the expenses of diners include no train expenses and no car expenses having relation to mileage, except repairs, the expenses are more properly divided on the same basis or ratio as revenues are divided. Making the division of expenses in this manner, and leaving all other items the same, would decrease the assignment of expenses to Michigan by $3,264.05, and would increase the net revenue from diners for 1913, from the $725.32 allowed by the Master, to $3,989.37.

Any basis for assignment of expenses in this service between states which assigns to Michigan a greater proportion of expense than of revenue is on its face improper, as it must be assumed that the expense for service and supplies would be no greater, and probably would be less, in the state where the greater volume of service occurs than in the state where the lesser volume occurs.

On page 266 of his report, the Master states he does not know in what manner revenues of sleepers and diners are divided by defendants between Michigan intrastate and interstate passenger. Such division was on the basis of passengers carried one mile in each class of service. This is the method used by the Master.

Objection No. 18:

The conclusion and finding that unearned increment in lands and other property, due to increases of values which complainant has been permitted to add to the value of its property and held entitled to a return upon, is not an income and not to be considered in determining the sufficiency of the rate of return, is erroneous, and the right is reserved to make the same the subject of an exception.

Objection No. 19:

Said report, in its conclusions and findings that common expenses, not otherwise divided between passenger and freight services by the Master, are properly to be divided, and in dividing the same on the basis of the modified revenue train-mile ratio as computed by complainant and adopted by the Master, is erroneous in the particulars that:

(a) It disregards the actual volume and time of use, which are the proper factors for dividing those expenses incident to weather and time, and not to train movement; and it disregards the gross ton-mile ratio, which is to be considered in dividing those expenses due to train movement and the result of wear.

(b) It passes over, and refuses to take and apply, a basis as favorable as defendants' modified revenue train-mile ratio, which more clearly approximates correct results than does complainant's modified revenue train-mile ratio.

(c) It divides weather expenses upon a basis having no proper relation to their causes.

(d) In the computation of the modified revenue train-mile ratio adopted by the Master, the imper-

fections appear, which are hereinbefore described in Objection No. 10.

Objection No. 20:

Objection is made, and exception taken, to so much of said report as finds that there is proof of loss of power in the freight engines due to super-elevation of curves for passenger service, or that any amount can be fixed for the cost thereof attributable to fuel.

Objection No. 21:

Objection is made, and exception taken, to so much of said report as finds the evidence to show that the line and road of complainant is better maintained than if maintained for freight service only.

The evidence on the question of better maintenance for passenger service was quite evenly balanced between the witnesses who testified that such better maintenance did exist and those who testified that it did not exist. The tests, however, applied to the testimony of these witnesses and referred to in Defendants' Briefs (typewritten Brief, pp. 316-19), show that those witnesses who testified to better maintenance were in error, and that those who testified to no better maintenance due to the passenger service were correct (see, also, Defendant's typewritten Brief, pp. 311-16, 319-20).

Objection No. 22:

Objection is made, and exception taken, to so much of said report as divides account number 91, "Crossing Flagmen and Gatemen," on the modified revenue train-mile ratio.

Such expenditures are for the protection of the public, not only against the operation of trains, but also against the much more frequent movement of cars and locomotives engaged in switching; therefore, as they only exist in yards on complainant's road, they are most properly divided in the proportion of freight and passenger yard switching.

Objection No. 23:

Objection is made, and exception taken, to the division of common Michigan passenger expenses between intrastate and interstate on the ratio of passengers carried one mile, as the cost per passenger per mile is so affected by the relative density of traffic that, due to the greater number of passenger miles in the intrastate business as opposed to the interstate business, the cost per passenger per mile is of necessity less in intrastate.

On page 304 of complainant's brief, it states, "It must be remembered that density of traffic is one of the most important factors in rate making."

Conceding the correctness of this statement and applying it to the cost of intrastate as opposed to interstate passenger carriage, it of necessity follows that the greater density of intrastate passenger miles produces less costs per mile per unit. The admitted result of the application of these well-known and conceded principles is that costs of passenger carriage, when found, cannot be divided between intrastate and interstate passenger business, upon this railroad, on the basis of passengers carried one mile, but must be divided on a basis which makes allowance for the lesser cost per unit in the intrastate business due to the greater density of passenger miles. To apply the rule of passenger miles

without taking into account this factor is to deceive ourselves in the results. A table, prepared by Mr. Parker, was furnished upon the argument, which showed the results of considering the added intrastate passenger miles since 1910 as causing but 20 per cent of the expense attributed to the passenger miles previously existing, this percentage being based upon the testimony of Mr. Delf. We insist that the ratio of division between intrastate and interstate fixed in that computation was more proper than the division upon straight passenger miles.

Objection No. 24:

Objection is also made to the division, between intrastate and interstate passenger business, of the accounts "Station Employees" and "Station Supplies and Expenses" on the relative number of intrastate and interstate passengers, as such division should be on a ratio not more unfavorable to the intrastate business than that of passengers carried one mile.

The division of the accounts "Station Employees" and "Station Supplies and Expenses" on the relative basis of passengers traveling in intrastate and interstate passenger business apportions to the intrastate business, in 1913, 88.04 per cent; in 1912, 87.50 per cent; in 1911, 86.90 per cent; and in 1910, 85 per cent.

This assumes that the cost of selling tickets to, and use of station privileges by, interstate passengers are but 12 per cent to 15 per cent of the entire cost, and that the cost of sale of tickets to, and use of station facilities by intrastate passengers are 85 per cent to 88 per cent, which is not the fact.

It is well known that the agent must be on duty anyhow; that he can sell more tickets without extra cost to the company, and that the costs would not vary in the proportion of tickets sold, but that the tickets sold in greater volume would be sold at less expense per unit than those sold in lesser volume.

Also, the proof shows, and common knowledge indicates, that the cost for ticket sales to, and the use of station facilities by, persons traveling interstate, who, for the most part, purchase coupon tickets and use the stations more, are more per ticket than the cost of sale of tickets to, and the use of station privileges by, intrastate passengers, as they, for the most part, purchase card tickets.

If these accounts are divided on the ratio of passengers carried, there is nowhere in the case any adjustment to take care of the greater interstate expense of accounting and adjustment and settlement of traffic balances. This expense is in a measure compensated for if the division is on the basis of passengers carried one mile. The additional costs per ticket, or per passenger, in interstate, as against intrastate, are pointed out in detail in Defendants' typewritten Brief (pp. 467-71).

It must not be forgotten that the agent does not devote his time exclusively to the sale of tickets, but that, at most stations, he attends to the telegraphing for all services, attends to the mail and express, and to the switch lights, etc.

Objection No. 25:

The proposed report states that the account "Industrial and Immigration Bureaus," under "Traffic Expenses," is divided on the gross revenue basis, while the Master's Exhibit 6 states that this account is divided, as

it is in fact divided, on the modified revenue train-mile ratio.

Objection No. 26:

Said report and its determinations and findings, upon which the Master bases and allows an estimated loss, due to putting into effect the rate of two cents per passenger per mile, equal to the difference between the earnings under the rates now in force and the earnings on a flat two cents per passenger per mile applied to the same amount of passenger business as done in the years considered, are objected and excepted to for the reasons that:

(a) There is no proof that there will be any loss.

(b) There is no basis for a conclusion that increased traffic will not result from the decreased rate.

(c) Said rate never having been put into operation there is no experience or basis on which to estimate loss due to putting it into effect.

(d) There is no testimony that increased traffic due to the decreased rate will not so increase the volume of traffic carried that there will be no loss.

(e) The presumption, that increased traffic due to the decreased rate will be sufficient to overcome, in whole or in part, the loss in revenue per passenger per mile due to the decreased rates, has not been overcome.

(f) The conclusion that the reduction of rate in 1907 did not result in increased traffic is unsupported by the evidence, and the proper conclusion therefrom is that an increase did result from such reduction.

The rates affected by this case have never been put into operation. The record does not show, and no one knows or ever will know, unless they are put into operation, whether the result of their operation will produce increased traffic or not, or how fully the increased traffic, if produced—and experience says that it will be—will compensate for the reduction of rates. The logical, and almost inevitable, result of decreased rates is increased traffic. This is the holding of the cases cited in Defendants' printed Brief (pp. 137-40), and in Defendants' typewritten Brief (pp. 511-13).

To say, without the test of experience and without testimony—for there is none—that the decreased rates will not produce increased traffic is impossible. To allow complainant, as loss, the full difference between the amounts produced by the old rates and amounts which would be produced by the new rates is to disregard the experience, which amounts almost to presumption that traffic will increase, and to cast the burden against the validity of the statute, and to render it impossible that there can ever be any operation which will determine whether the rates, if put into effect, would be confiscatory or not.

In numerous cases, injunctions have been denied and complainants required to put the rates into effect, in order to give the test of experience.

Of the cases cited by the Master to the contrary effect, the *Arkansas Rate Cases* (187 Fed. 309) will be found on inspection to have been a case where the rate had been put into operation, and the figures and computations presented in the case were those based upon actual operation under the reduced rate; thus that case is not applicable.

In *Chicago and Northwestern vs. Dey* (35 Fed. 881), the question presented was not the sufficiency of rates

under proofs, but was whether a temporary injunction should issue, pending investigation. The defendant pointed to the probability of increased traffic to prevent issuance of the temporary injunction, which resulted in the language the Master has quoted (p. 285).

That situation was very different from assuming, when all proofs are in and there is no proof that loss will occur, that there will be a loss equal to the difference between the old and new rates applied to the previous traffic.

If the language quoted by the Master could be regarded as the judgment of the Court applicable in a trial on the merits with full proofs, then it is contrary to the later decisions of the Federal Supreme Court (cited in Defendants' Briefs), which proceed on the theory that reduced rates will operate to increase traffic.

It should not be overlooked that the same questions as presented in the *Dey Case* were again before Justice Brewer a few months later (38 Fed. 656, 664), and at that time he modified his previous ruling and required the test of experience, saying:

> " * * * Of course this fact does not authorize injustice, or sanction rates which are unreasonable; but it suggests the propriety in view of the considerations heretofore noticed, of actual experiment as the most satisfactory test of the reasonableness of rates. I quote in this respect the language of Mr. Chief Justice Woods in the case of *Tilley vs. Railroad Co.*, 5 Fed. Rep. 662:
>
> > 'The officers of the railroad company declare that the rates fixed by the commission will so reduce its income that it will not suffice to pay the running expenses of the road and the interest on its bonded debt, leaving nothing for dividends to its stockholders. **The railroad commis-**

sioners assert that their schedule was framed to produce eight per cent. income on the value of the road after paying cost of maintenance and running expenses. Which view is the correct one it is impossible to decide from the evidence submitted. There is, however, a conclusive way,—and it seems to me it is the only one,—by which this controversy can be settled, and that is by experiment. A reduction of railroad charges is not always followed by a reduction of either gross or net income. It can soon be settled which is right—the railroad company's officers or the railroad commission—in their view of the effect of the commission's tariff of rates by allowing the tariff to go into operation.'

While quoting this language as applicable hereto, I do not mean to indorse it as of universal application, but only under the circumstances of the present case. Where the effect of the rates is doubtful, with a probability that they will prove compensatory, and the amount of business to be affected thereby is comparatively small. I think the courts may well wait for the test of experience. Influenced by these considerations, I am led to refuse the preliminary injunction, and to set aside the restraining order heretofore entered. It may well be that by the time this case comes to a final hearing the test of experience will have solved some of these matters, and it may be clear—as now seems probable—that the rates imposed by this last schedule are compensatory within the rule laid down in the prior opinion, in which case no injunction ought to issue, or clear that they are not compensatory, in which case, be-

yond any doubt in my mind, a final and permanent injunction ought to be granted. * * * ."

The result of the Master's ruling is to deny the test of experience, or the necessity therefor. The result of the rulings in the decided cases is that where there is an appreciable return, as there is in this case upon the Master's computations, the test of experience will be required, and the requirement of that test of experience should not be hindered either by the finding of the Master or a ruling of the Court.

Upon final proofs, where the complainant has not itself put the rates into operation and furnished the basis for a test of experience, but has engaged in a protracted litigation, it will at the end of such litigation, if an appreciable return is shown, be required to carry at the rates fixed, on the assumption that increased business will be produced by their reduction. In *Knoxville vs. Knoxville Water Co.* (212 U. S. 15-16), this practice was followed. The Court there said:

" * * * The precise subject of inquiry was, what would be the effect of the ordinance in the future. The operations of the preceding fiscal year, or of any other past fiscal year, were valueless if the year was abnormal, and were only of significance so far as they foretold the future. If, as in this case, sufficient time has passed, so that certainty instead of prophecy can be obtained, the certainty would be preferable to the prophecy. In this case there could be no absolute certainty, because the ordinance had never been put in operation. But evidence of the operations of the years succeeding to the ordinance is relevant and of great importance, and by a consideration of such evidence a much greater degree of certainty could be obtained. Suppose, by way of illustration, that before bringing suit the company

had put the ordinance into effect and had observed it for a number of years, and the result showed that a sufficient net income had been realized, is it possible that a suit then could be brought and the evidence confined to a period prior to the ordinance, and by a process of speculation the conclusion reached that the ordinance would be confiscatory? Some evidence regarding the income of the company, after the passage of the ordinance, is in the record, but it subsequently was excluded from consideration. It showed an increase of gross and net earnings, but also an increase in the property devoted to the public use. We are unable to say what the effect of the evidence excluded would be; all we can say is, that the inquiry was unduly limited by the exclusion of the evidence of the operation of subsequent years.

It follows from what has been said that the judgment of the court below cannot stand. There was error in the appraisement of the present value of the plant, in the deduction of the reductions made by the ordinance, and in the exclusion of evidence relating to the operations of the company after the enactment of the ordinance.

In ordinary cases full justice would be done by reversing the decree and remanding the cause for further proceedings in the court below, thereto undergo a new and doubtless prolonged investigation. It is more than seven years since the enactment of the ordiannce, and it has never been observed in any respect. This litigation ought now to be ended, if it is possible to end it with due regard to the rights of the contending parties. Disregarding for the moment all the errors which were committed in the court below, the decision of this cause may be rested upon a broader ground, which is clearly indicated

by the previous judgments of this court. The jurisdiction which is invoked here ought, as has been said, to be exercised only in the clearest cases. If a company of this kind chooses to decline to observe an ordinance of this nature and prefers rather to go into court with the claim that the ordinance is unconstitutional, it must be prepared to show to the satisfaction of the court that the ordinance would necessarily be so confiscatory in its effect as to violate the Constitution of the United States. * * *."

Statistics of complainant show its printed Brief (p. 244) to be in error, and that there was an increasing volume of intrastate passenger miles from year to year, and an increase in the number of passengers carried, the figures being as follows:

Year	Number of Passengers	Passengers one Mile
1910	588,745	18,358,957
1911	621,628	19,645,802
1912	628,593	20,090,114
1913	669,350	21,744,820

This of itself indicates that the conditions are such that the intrastate traffic will be increased by the decreased rate. If, as complainant claims in its Brief, the refund coupon affords some stimulus to traffic, its effect may already be marked by the increases shown.

That the reduction of rates by those in public service will increase business is not merely a possibility, but is a probability, is established. This probable result is regarded as so sure to happen that where there has been no test of experience it is the invariable rule to require the rates to be put into effect before a law reducing them is declared invalid.

It follows, that a decision of invalidity will not be

predicated alone upon losses said to be due to the decreased rates until those losses are shown by the effects of actual operation under the rates. We think no case can be found where a final decision of invalidity has been predicated upon such losses not shown by actual experience.

In *Tilley vs. Savannah, Florida & Western* (5 Fed. 663), it was said:

> "A reduction of railroad charges is not always followed by a reduction of either gross or net income. It can soon be settled which is right—the railroad company's officers or the railroad commission—in their view of the effect of the commission's tariff of rates, by allowing the tariff to go into operation."

In *Capital City Gaslight Co. vs. Des Moines* (72 Fed. 846-7), it was said:

> "It is insisted by defendant that the reduction in price of gas will work a corresponding and large increase in amount consumed, resulting in increase of net profits as well. That some increase in consumption will follow reduction in price, plaintiff admits, but insists that there is no basis for believing such increase will be large, or that the net profits will increase at all. What will be the amount or per cent of increase in consumption, and whether any increase in profits will result from reduction of rates, is, and must at present be, an uncertain matter. In Railroad Co. v. Wellman, 143 U. S. 343, 12 Sup. Ct. 400, Mr. Justice Brewer inquires:
>
> > 'Must it be declared, as matter of law, that a reduction of rates necessarily diminishes income? May it not be possible—indeed, does not all experience suggest the probability that a reduction of rates will increase the amount of

business, and therefore the earnings? At any rate, must the court assume that it has no such effect, and, ignoring all other considerations, hold, as a matter of law, that a reduction of rates necessarily diminishes the earnings?'

"The same learned justice, in the opinion rendered by him on this circuit, as circuit judge, in Railway Co. v. Dey, 35 Fed. 881, when speaking of the application in that case of the possible increase of business as following reduction of rates, uses this language:

'Again, it is said that it cannot be determined in advance what the effect of reduction in rates will be. Oftentimes it increases business, and who can say that it will not in the present case so increase the volume of business as to make it remunerative—even more so than at present? But speculations as to the future are not guides for action. Courts determine rights upon existing facts. Of course, there is always a possibility of the future; but the only fair judicial test is to apply the rates to the business that has been done in the past, and see whether, upon that basis, such rates will be remunerative, or will compel the transaction of business at a loss.'

"After all, there can be but one certain method of ascertaining the effect of reduction of rates, and that is the test of experience."

In *Cotting vs. Kansas City Stock Yards Co.* (82 Fed. 839, 850), it was said:

" • • • Besides, it does not always follow that a decrease in rates results in a corresponding decrease in net earnings. Generally, business under

the stimulus of reduced rates increases in volume. * * * ."

In *Central of Georgia vs. M'Lendon* (157 Fed. 976), it was said:

"The foregoing brings the matter down to the other important, and for the present controlling, question in the case, namely, whether the complainant will sustain any loss in revenue by reason of the decreased passenger rate on its domestic business. It is alleged in the bill that this loss will be approximately $300,000. A table is given showing the actual earnings, and the estimated earnings by reason of this circular. There would seem to be a very great difference between the effect of a reduction in passenger rates and in freight rates. In the case of reduction in passenger rates, the decreased rate might stimulate travel, and increase it to such an extent as to overcome the difference in rate, whereas the same amount of freight would probably move under any reasonable rate. The court is asked to assume that the reduction in rate would necessarily bring about a reduction in revenue. In the case of Railroad Company v. Wellman, 143 U. S. 339, 12 Sup Ct. 400, 36 L. Ed. 176, it is said in the opinion of Mr. Justice Brewer on this subject:

> 'Must it be declared as a matter of law that a reduction of rates necessarily diminishes income? May it not be possible—indeed, does not all experience suggest the probability—that a reduction of rates will increase the amount of business, and therefore the earnings?'

"This language was quoted with approval in Railway Company v. Gill, 156 U. S. 649, 15 Sup. Ct. 484, 39 L. Ed. 567."

In *Railroad Commission vs. Central of Georgia* (170 Fed. 235-36), it was said:

> " * * * there is left an element of uncertainty that is not answered by a reference to last year's profits, to-wit, the amount of business that would be done under the lower rates, and this nothing but a practical test would show. 'May it not be possible—indeed, does not all experience suggest the probability—that a reduction of rates will increase the amount of business, and, therefore, the earnings?' Chicago & G. T. Railway Company v. Wellman, 143 U. S. 339, 343 * * * ."

In *Lincoln Gas & Electric Light Co. vs. Lincoln* (182 Fed. 929), it was said:

> " * * * It is quite probable that the reduced rate would considerably increase the consumption of gas and thus increase complainant's net profits. The record shows that in June, 1902, complainant voluntarily reduced its rates from approximately $1.50 per thousand to $1.20, and the amount of gas consumed, and net profits resulting, considerably increased. * * * ."

In *Chicago & Grand Trunk vs. Wellman* (143 U. S. 343), it was said:

> " * * * Must it be declared, as matter of law, that a reduction of rates necessarily diminishes income? May it not be possible—indeed, does not all experience suggest the probability—that a reduction of rates will increase the amount of business, and therefore the earnings? * * * ."

In *Willcox vs. Consolidated Gas Co.* (212 U. S. 51), it was said:

> " * * * And again, increased consumption at the lower rate might result in increased earnings, as

the cost of furnishing the gas would not increase in proportion to the increased amount of gas furnished.

Of course, there is always a point below which a rate could not be reduced, and, at the same time, permit the proper return on the value of the property; but it is equally true that a reduction in rates will not always reduce the net earnings, but, on the contrary, may increase them. * * * ."

In *Railroad Commission vs. Cumberland Telephone & Telegraph Co.* (212 U. S. 426), it was said:

" * * * We say this because the evidence shows that, in the case of telephone companies, the general result of a reduction of rates in some other kinds of business does not always follow,—namely, that there would be an increased demand, which could be supplied at a proportionately less cost than the original business. Such, it is admitted, would be the case generally in regard to water companies, gas companies, railroad companies, and perhaps some others, where the rate is a reasonable one. * * * ."

There have been cases in which actual test did not show sufficient increase in business to compensate for the decrease in rate, but those cases are not cited as not germane to the issue where there has been no test.

Objection No. 27:

The defendants reserve the right to present to the Court an exception that the said report in its determinations and findings as to the amounts of property, revenue and expenses attributable to complainant's freight business, and the intrastate proportion thereof, is improper, in that:

(a) An insufficient amount of property and expenses is assigned to freight business, with the result that passenger business is unduly burdened.

(b) In the division of property and expenses allocated and assigned to freight business between intrastate and interstate, an excess amount thereof is assigned to intrastate.

(c) In the division of property and expenses between the intrastate and interstate business, the allowance of a greater amount of stational expense as attributable to intrastate than is attributed to interstate business is improper and founded on improper and insufficient evidence.

Objection No. 28:

The defendants reserve the right to present to the Court an exception that the said report and its determinations and findings as a whole are erroneous and not in accordance with the evidence, as:

(a) The net revenues shown therein to be earned by, or attributed to, the intrastate passenger business are less than under all the evidence they should be found to be.

(b) The amounts of property and expenses attributed, assigned or allocated to intrastate passenger business are greater than under all the evidence they should be found to be.

Objection No. 29:

The defendants reserve the right to except to the refusal of the Master to permit the introduction of, or to consider, the report showing passenger earnings for the fiscal year 1914.

The defendants request that the details of the computations, the results of which are found in, or accompany, the proposed report, be made part of the report.

In Conclusion:

The above objections are presented with the purpose of saving the defendants' rights of review by the court, while avoiding hypercritical contentions. Our desire is to aid the Master to the utmost in reaching correct results, and the earnest convictions of counsel for the State, in the justice of its case, and in the merits of their contentions, lead them, in the outline hereinbefore set forth, to again attempt to present in brief and compact form the points upon which, taken separately or cumulatively, the case may be said to turn.

DISCUSSION OF COMPLAINANT'S OBJECTIONS.

Valuations.

Under this heading complainants make a general objection to my valuation of certain designated schedules (thirteen in number), but make no specific objection as to any particular schedule except Schedules 19 and 20. As to the other schedules the objection amounts merely to a notice of an intention to make specific objections thereunder to the court in opposition to the confirmation of my valuations of those schedules, and as such calls for no consideration by me.

With reference to Schedules 19 and 20, specific objection is made to the assignment to Wisconsin of any portion of the value of shops, engine houses and turntables and shop machinery and tools, all of which are located in Michigan.

This objection is based on the theory that all property that is located and used entirely in Michigan should be treated as wholly intrastate, although the use is for the entire system and is therefore shared to some extent by the service in Wisconsin. I cannot accept that theory.

Where property is so used that the results of the use are shared by both the intra and inter services, I am clearly of opinion that such property should be apportioned between the two services in proportion to the extent that each shares in those results, whether the property is in one state or the other, and therefore that the objection is not well taken.

Taxes During Construction.

Under this heading objection is made that my allowance of $100,000 for taxes during construction is too small and should be increased to $150,000.

This subject was very carefully considered by me in all its bearings; and I can see no reason for changing the views expressed or the conclusion reached in my findings. That conclusion I believe to be just and fair to both parties.

Average Year as Typical.

Complainants here object to the taking of an average year as typical instead of a single year. A similar objection is made by defendants and I have decided to sustain both objections, and abandon the average of four years taken as typical in my findings and to adopt instead the year of 1913. My reasons therefor will be found set forth in connection with the defendants' objections, numbered 11 and 12.

$12,000 Paid to President Fitch.

Under this head complainants object to my refusal to allow as an item of expense the $12,000 paid to retiring President Fitch in 1913. I am still of opinion that it is necessary to exclude this payment to President Fitch, from the expenses of 1913. However just the payment may have been as between him and the company, it is to

my mind clearly impossible to admit it as a normal expenditure for that year, and as such an item of expense for which the public should be required to provide in future years. The evidence as to the exact nature of this payment is meagre and unsatisfactory. It is clear, however, that the payment was not a part of the president's salary either for that or any other year, and that it therefore cannot be treated as part of the normal expenses of 1913.

Adjustments Made in Accounts For 1913.

Objection is here made to my deductions on account of abnormal expenses for the year of 1913 on the ground that they are too great in that they bring the expense account of 1913 down to the level of the average of 1910-11-12, which the objection assumes was abnormally low.

If the assumption on which this objection is founded were warranted, the alleged inconsistency in my finding would be very palpable, but it is not warranted. That assumption is that the deferred maintenance for which deduction was made in the 1913 accounts accrued in the years 1910-11 and 12, and that the expenses for those years were, therefore, to that extent below normal; but the fact is that that deferred maintenance was not located as accruing in those years, or in any particular years; that those three years (and the five years as regards ballast) were not assumed to be below normal, but on the contrary were assumed to be normal as expressly stated in my finding. The objection is, therefore, not well taken.

Division of Michigan Passenger Operating Expenses Between Interstate and Intrastate.

Under this head it is objected that the division between inter and intra of expenses of station employees and

station supplies and expenses should be upon the basis of tickets sold instead of upon the basis of the number of passengers carried.

My division upon the basis of the number of passengers traveling inter and intra was so made because I considered that such division best reflected the use made by the two classes of passengers, respectively, of the station facilities. A division on the basis of the number of tickets sold would reflect only the use that is made in the purchasing of tickets which it certainly cannot be claimed constitutes the entire use. I see no reason to change the division that I have made of those expenses; although it is objected to by both parties—the defendants claiming that it should be on the basis of passenger miles made in each service as will appear in the discussion of their objections.

DISCUSSION OF DEFENDANTS' OBJECTIONS.

Objection 1.

This objection relates to my finding that the complainant is not estopped, by the acceptance of land grant lands by itself or its predecessors in ownership, from questioning the validity of the Michigan passenger rate statute, fixing rates of fare to be charged upon complainant's railroad of two cents per mile for the carriage of passengers.

The objection does not in form call for further consideration by me, and I have nothing to add to the quite full discussion of the subject contained in my findings.

Objection 2.

(Answered in body of report.)

Objection 3.

(Answered in body of report.)

Objection 4.

(Answered in body of report.)

Objection 5.

This is a general objection to the findings of value on the ground that they are too high.

Under it are 33 sub-objections divided into three classes, designated respectively by the letters (a), (b) and (c). These have all been answered in the body of the report, with the exception of numbers 5 (a) (6), 5 (a) (7), 5 (a) (8), 5 (c) (1), 5 (c) (2), 5 (c) (5), 5 (c) (9), 5 (c) (10), 5 (c) (11), 5 (c) (12), 5 (c) (14), 5 (c) (19) and 5 (c) (20), which will, in their order, be answered here:

Objection 5 (a) (6).

In asserting that I relied upon testimony of witnesses placing high values and refused to take the testimony of witnesses who fixed lower values, this objection is wholly in error. I am unable to imagine any reason for asserting that I relied on any particular testimony whatsoever, or refused to take any particular testimony. I took and carefully considered all testimony offered, whether it placed high values or low values, and gave to all of it careful and impartial consideration.

In like manner, this objection is in error in asserting that I refused to apply proven tests of the correctness or incorrectness of opinion evidence of value. If there are errors in my valuations, such errors are due to mistakes of judgment, and not to any refusal or failure to consider any part of the testimony bearing on the subject.

Objection 5 (a) (7).

The assertion here made that I refused to take into account or be influenced by values as fixed by actual purchases and sales of similar nearby and adjacent lands is in like manner erroneous. In all my valuations, I took into account and endeavored to give due weight to, all the testimony, including that relating to the sales of other lands.

Objection 5 (a) (8).

The subject of this objection, viz: clearing and grubbing, was fully discussed by me in connection with my finding on the subject (Schedules 1 and 3). In consequence of this objection, I have carefully reconsidered the subject, but have found no reason for changing the views already expressed.

Objection 5 (c) (1).

This objection is to my land valuation as a whole, and in the several counties, but no specific instance of overvaluation is specified in the objection. It is practically a repetition of Objection 5 (a) (5), which is answered in the body of the report, and what is there said is equally applicable here.

Objection 5 (c) (2).

This objection is that I have placed too high a value on the trackage rights in streets. I have reconsidered the subject and I see no reason for changing my views, nor do I see what other method of valuation could be adopted than that followed by me and fully explained in my findings.

Objection 5 (c) (5).

This objection is well founded. It relates to Schedule 7, "Rails". The amount allowed by me for this item

was erroneous in the respect pointed out in this objection, and it will be corrected accordingly—the correct amount is $1,170,995, instead of $1,193,882, and the same is allocated as follows:

Freight	$ 132,166
Common	1,038,829

Objection 5 (c) (9).

This objection is well taken. It refers to Schedule 16 of my valuations, viz, "Side Tracks". By error there was a duplication of ties at switch turnouts to the extent of 1,630 turnouts at $18 per turnout; but they were valued at 55% condition, not 60%, as stated in the objection.

In correction of this error, I have revised my report by making a deduction of $16,137, allocated as follows:

Passenger	$ 168
Freight	10,702
Common	5,267

Objection 5 (c) (10).

This objection, which relates to my allowance for engineering on roadway and structures (Schedule 29) is not well founded. It is clear from Mr. Hansel's testimony that the $20,000 here referred to was not included in his estimate of $255,000 for engineering on roadway and structures.

Objection 5 (c) (11).

This objection relates to my valuation of Schedule 30, "Locomotives". I find this objection to be well taken and have corrected my findings by dividing the value of the work locomotives between passenger and freight on the basis of the assignments of maintenance of way and structure expenses for 1913, and by changing the allocation of locomotive No. 43 from passenger to freight.

Objection 5 (c) (12).

This objection relates to my valuations of Schedule 31 "Passenger Train Cars," and it is well taken. The proportion of value attributed by me to the Michigan passenger business is too large in the amount claimed by defendants. The correct amounts are as claimed by them, viz:

Passenger	$248,823.
Common	6,464.
Total	$255,287.

I have corrected my report in this regard.

Objection 5 (c) (14).

This objection calls for the rejection of the entire item of contingencies. On a reconsideration of this subject, I have found no reason for changing the views already expressed.

Objection 5 (c) (19).

This objection is another one of those that are too general to afford anything specific for consideration or discussion, and what was said in this regard in answer to Objection 5 (a) (5) is equally applicable here, and the answer to the last named objection is in the body of the report.

It should, however, be stated in connection with this objection that as a matter of fact, the amounts allowed by me for depreciation were generally those fixed by the defendants' expert, Mr. Hansel, his figures being taken on all the depreciated schedules except Water Stations and Station Buildings and Fixtures, and on those schedules the differences between Mr. Hansel's allowances and mine were not large. The item of ballast does not

fall within the scope of this objection, but is objected to separately.

Objection 5 (c) (20).

This objection is to my allowance for appreciation. In the disposition of the subject made in my findings, I sought diligently to safeguard the rights of both parties, and I then thought and still think that that object was accomplished and that nothing further is called for from me.

Objection 6.

(Answered in body of report.)

Objection 7.

(Answered in body of report.)

Objection 8.

The point raised by this objection refers to my failure to deduct the value of property contributed complainant by the public, and is covered by the principle referred to above under Objection 6 (contained in the body of the report), that the company is entitled to a return upon the value of all property used without regard to the ownership of the property or how it was acquired.

Objection 9.

(Answered in body of report.)

Objection 10.

(Answered in body of report.)

Objections 11 and 12.

(Answered in body of report.)

Objection 13.

This objection relates to a discussion of depreciation contained in my report, wherein I had under consideration the claim of the complainant that in using the average expenses of the years 1910 to 1913 inclusive, I should include as expenses an annual depreciation in bridges, trestles, culverts and other structures, with reference to which the complainant had in its accounts as kept included no depreciation charge. I am satisfied with the views there expressed. But the final conclusion at which I arrived was as stated on page 226 of my report, viz: that I could make no allowance on account of depreciation as an expense charge for the reason that complainants have not furnished testimony from which I am able to determine with sufficient definiteness a proper amount for such item.

The objection therefore has no practical application to or bearing on this case.

Objection 14.

This objection is misconceived, as I expressly declined to make such finding as is therein described.

Objection 15.

I understand that this objection is merely the reservation of a right to object before the court that my deduction from the operating expenses of 1913 to take care of supposed abnormalities therein are not sufficient, and that therefore no further consideration or discussion of the subject by me is here called for.

Objection 16.

(Answered in body of report.)

Objection 17.

(Answered in body of report.)

Objection 18.

I have reconsidered the subject of unearned land increment (so-called) referred to in this objection, and find no reason to change the views on that subject heretofore expressed.

Objection 19.

This objection relates to the use of the modified revenue train mile ratio for the division of certain common expenses, and the objections are in addition to those already treated by me under Objection 10. The subjects included in this objection I have so fully treated in my report that I see no occasion for further discussion of them here.

Objection 20.

The objection is to so much of my report as finds that there is proof of loss of power in freight engines, due to super-elevation of curves for passenger service, or that any amount can be fixed for the cost of such loss. I have carefully reviewed the testimony on this subject, and it still seems to me that the evidence upon which my finding in this regard was based is substantially without contradiction and fully justifies the finding.

Objection 21.

(Answered in body of report.)

Objection 22.

(Answered in body of report.)

Objection 23.

(Answered in body of report.)

Objection 24.

(Answered in body of report.)

Objection 25.

This objection calls attention to an error in the exhibits attached to my proposed report, in that while I stated in my report that the expense account "Industrial and Immigration Bureaus" under "Traffic Expenses," was divided on the gross revenue basis, my Exhibit 6 states that the account is divided on a modified train mile ratio and as a fact, in the other exhibits.

The defendants request that the details of the computations, the results of which are found in, or accompany, the proposed report, be made part of the report.

In Conclusion.

The above objections are presented with the purpose of saving the defendants' rights of review by the court, while avoiding hypercritical contentions. Our desire is to aid the Master to the utmost in reaching correct results, and the earnest convictions of counsel for the State, in the justice of the case, and in the merits of their contentions, lead them, in the outline hereinbefore set forth to again attempt to present in brief and compact form the points upon which, taken separately or cumulatively, the case may be said to turn.

We bespeak a thoughtful consideration presented and feel certain that if we have made our positions clear, our arguments will not have been made in vain.

GRANT FELLOWS,
Attorney-General.

ROGER I. WYKES,
Of Counsel.

Dated June 7, 1916.

EXHIBIT 1.

VALUATION OF THE PROPERTY OF THE

Duluth, South Shore & Atlantic Railway Company in Michigan

AS OF JUNE 30th, 1913.

Schedule No.		Passenger P. V.	Freight P. V.	Common P. V.	Total P. V.
1.	Right of Way and Station Grounds	$ 142,679	$ 1,025,228	$ 612,332	$ 1,780,239
3.	Grading	393	278,437	2,487,884	2,766,714
5.	Bridges, Trestles and Culverts	.....	12,949	438,240	451,189
6.	Ties	.....	27,544	258,918	286,462
7.	Rails	.....	132,166	1,038,829	1,170,995
8.	Track Fastenings	.....	19,201	152,492	171,693
9.	Frogs, Switches and Crossings	941	62,074	60,045	123,060
10.	Ballast	.....	39,373	570,874	610,247
11.	Track Laying and Surfacing	.....	29,442	248,262	277,704
12.	Fencing	.....	6,296	76,900	83,196
13.	Crossings, Cattle Guards and Signs	.....	913	11,690	12,603
14.	Interlocking Signal Apparatus	.....	.....	800	800
15.	Telegraph and Telephones	.....	516	36,556	37,072
16.	Side Tracks	7,713	391,244	153,818	552,775
17.	Station Buildings and Fixtures	43,864	38,502	59,538	141,904
19.	Shops, Enginehouses and Turntables	.....	10,961	176,020	186,981
20.	Shop Machinery and Tools	.....	281	98,987	99,268
21.	Roadway and Construction Tools	.....	.....	12,832	12,832
22.	Water Stations	.....	.....	72,422	72,422
23.	Fuel Stations	.....	845	68,249	69,094
26.	Docks and Wharves { Ore Docks Nos. 4 and 5	.....	392,980	.....	392,980
	{ Other Docks	715	56,842	24,581	82,138
27.	Electric Plants	.....	.....	8,855	8,855
28.	Miscellaneous Structures	.....	16,357	103,367	119,724
	Sub Total (1) Schedules 3 to 28	$ 53,626	$ 1,516,923	$ 6,160,159	$ 7,730,708

29.	Engineering on Roadway and Structures	1,759	50,031	203,210	255,000
30.	Locomotives	147,377	280,932	.....	428,309
31.	Passenger Train Cars	248,823	.....	6,464	255,287
32.	Freight Train Cars	.....	1,116,545	.....	1,116,545
33.	Miscellaneous Equipment	.....	.....	59,972	59,972
34.	Ferries and Steamships	.....	210,000	.....	210,000
35	Engineering on Equipment—2% on Schedules 30-33	7,924	27,949	1,329	37,202
36.	Terminals (S. M. Un. Depot Co.	22,006	6,906	11,091	40,003
	(N. J. Bridge Co.	.....	.....	60,271	60,271
	Sub Totals (2) Schedules 3-36	$ 481,515	$ 3,209,286	$ 6,502,496	$10,193,297
37.	Contingencies	.....	.....	400,000	400,000
38.	Legal Expenses during construction	2,360	15,740	31,900	50,000
39.	Organization, Administration and General Expenses	5,900	39,350	79,750	125,000
40.	Interest during construction	3,459	92,982	451,216	547,657
"	Taxes " "	.....	.....	100,000	100,000
41.	Furniture and Fixtures	.....	.....	9,735	9,735
42.	Stores and Supplies	2,844	5,557	264,410	272,811
43.	Working Capital	.....	.....	167,107	167,107
	Totals Schedules 1-43	$ 638,757	$ 4,388,143	$ 8,618,946	$13,645,846
	Appreciation	.....	30,000	270,000	300,000
	Totals	$ 638,757	$ 4,418,143	$ 8,888,946	$13,945,846
	Less Michigan property assigned to Wisconsin	102	720	43,086	43,908
	Total Michigan Present Value	$ 638,655	$ 4,417,423	$ 8,845,860	$13,901,938

EXHIBIT 1.

Assignment to Passenger, Intrastate Passenger and Interstate Passenger of the value as of June 30th, 1913, of the Complainants Michigan Property.

Schedule No.		Common P. V.	Passenger Prop'n of Common Percent	Passenger Prop'n of Common P. V.
19.	Shops, Enginehouses & Turntables—Assignable to Yard Engines	$ 30,892	3.9	$ 1,205
	Overhead (Int. Schedule 40) 4% " " " "	1,235	3.9	48
19.	Shops, Enginehouses & Turntables—Assignable to Road Engines	145,128	37.08	53,813
	Overhead (Int. Schedule 40) 4% " " " "	5,805	37.08	2,152
20.	Shop Machinery and Tools	98,987	30.22	
"	" " " " Overhead charges (Int. Sched. 40)	2,969		30,811
21.	Roadway and Construction Tools	12,832		
"	" " " " Overhead charges (Int. Sched. 40)	384	30.22	3,994
22.	Water Stations	72,422	29.56	
"	" " Overhead charges (Int. Sched. 40)	2,196		22,057
23.	Fuel Stations	68,249	29.56	
"	" " Overhead charges (Int. Sched. 40)	2,730		20,981
42.	Stores and Supplies	264,410	30.22	79,905
43.	Working Capital	167,107	30.22	50,500
	Totals	$843,219		$265,466

SUMMARY.

		Michigan		Michigan Passenger				
				Total				
Total Common (page 1)		$8,845,860						
Less Common in Schedules 19, 20, 21, 22, 23, 42, 43,	$843,219							
" 37 Contingencies	400,000							
" 40 Taxes	100,000	1,343,219	Per Cent					
		$7,502,641	41.91	$3,144,356				
Less Pass. Pro. of Soo Bridge (42.03% of $60,271) (All Interstate)				25,259				
				$3,119,097.				
Add Exclusive Passenger (Page 1)				638,655				
Add Pass. Pro. of Schedules 19 to 23, 42 and 43 (See above)				265,466				
Add Pass. Pro. of Schedule 37—Contingencies, 31.47% of $400,000				125,880	—Intrastate—		—Interstate—	
Add Pass. Pro. of Schedule 40—Taxes, 31.86% of $100,000				31,860	Per Cent		Per Cent	
				$4,180,958	65.58	$2,741,872	34.42	$1,439,086
Add. Pass. Pro. of Soo Bridge,				25,259		.....		25,259
Total Michigan Passenger				$4,206,217		$2,741,872		$1,464,345

EXHIBIT 2.

Passenger Business in Michigan—Year ended June 30th, 1910.

			Total	Intrastate	Interstate
Revenue from Passengers—Intra, 56.39%; Inter., 43.61%, allocated			$834,530.16	$470,580.29	$363,949.87
Excess Baggage— Intra., 56.39%; Inter., 43.61%			12,717.57	7,171.44	5,546.13
Mail Revenue— " " " "			50,284.23	28,659.78	22,164.45
Express Revenue— " " " "			36,042.94	20,324.61	15,718.33
Other Pass. Train Rev.—Intra., 56.39%; Inter., 43.61%			13,483.54	7,603.37	5,880.17
Milk Revenue on Pass. Trains—Intra. and Inter. allocated			218.60	218.60	.....
Special Service Train Revenue— " " " "			455.50	455.50	.....
" " " " Intra., 56.39%; Inter., 43.61%			250.00	140.98	109.02
Storage—Baggage, Intra. and Inter. allocated			23.95	23.95	.....
Station and Train Privileges, Intra., 56.39%; Inter., 43.61%			436.49	246.14	190.35
*Telegraph Service, Pass. 33.01%— " " " "			160.54	90.53	70.01
*Rents of Buildings and Other Property—Allocated to Pass., $192.00 Com. $2,833.65; Pass. 33.01%			1,127.39	635.74	491.65
*Miscellaneous Revenue—Pass. 33.01%—Intra., 56.39%; Inter., 43.61%			1,598.38	901.33	697.05
Joint Facility Revenue (Bal. Cr.)			980.06	527.59	452.47
			$952,849.35	$537,579.85	$415,269.50
Outside Operations — Sleeping Cars	Gross Revenue $25,803.21; Expenses 14,060.06	Net Revenue	7,905.48	4,457.90	3,447.58
Outside Operations — Dining Cars	Gross Revenue $26,365.35; Expenses 30,203.02				
Hire of Equipment— Intra, 56.39%; Inter, 43.61%			3,846.79	2,169.20	1,677.59
*Interest, Passenger, 33.01%— " " " "			1,818.77	1,025.60	793.17
Rents Received (Joint Facility)— " " " "			2,964.83	1,671.87	1,292.96
Miscellaneous Income—Pass. 33.01%— " " " "			119.90	67.61	52.29
Total Revenue			$969,505.12	$546,972.03	$422,533.09

Operating Expenses (Intra, part allocated, part assigned and balance on passenger miles not equated	538,852.48	293,550.73	245,301.75
Rents Paid (Joint Facil.) $1,037.14 Interstate; balance Intra, 56.39%; Inter, 43.61%	8,730.37	4,338.21	4,392.16
Rents Paid (Miscellaneous), Intra, 56.39%; Inter, 43.61%	35.53	20.03	15.50
†Taxes	63,501.39	35,529.03	27,972.36
	$611,119.77	$333,438.00	$277,681.77
	$358,385.35	$213,534.03	$144,851.32
Net Income	$178,383.42	$105,504.93	$ 72,878.49
Estimated Loss by application of Act 276	$180,001.93	$108,029.10	$ 71,972.83
Net Return			

*Telegraph Service, Miscellaneous Revenue, Common Portion of Rents of Bldgs., etc., Interest and Miscellaneous Income, divided between Passenger and Freight on revenue basis.

†Taxes assigned to Passenger on basis of assignment of property to service as shown in Exhibit 1, and to Intra and Inter Pass. on the basis of passenger miles in 1910.

EXHIBIT 3.

Passenger Business in Michigan—Year ended June 30th, 1911.

	Total	Intrastate	Interstate
Revenue from Passengers—Intra, 61.05%; Inter., 38.95%, allocated	$823,125.81	$502,511.08	$320,614.73
Excess Baggage—Intra., 61.05%; Inter., 38.95%	10,361.62	6,325.77	4,035.85
Mail Revenue— " " " "	50,724.30	30,967.19	19,757.11
Express Revenue— " " " "	35,400.78	21,612.18	13,788.60
Other Pass. Train Rev.—Intra., 61.05%; Inter., 38.95%	6,705.21	4,093.52	2,611.69
Milk Revenue on Pass. Trains—Intra. and Inter. allocated	364.15	364.15	.....
Special Service Train Revenue— " " " "	1,692.41	949.11	743.30
Storage—Baggage— Intra., 61.05%; Inter., 38.95%	37.95	23.17	14.78
Station and Train Privileges— " " " "	562.84	343.61	219.23
*Telegraph Service—Passenger, 34.23% " " " "	180.37	110.12	70.25
*Rents of Buildings and Other Property—Allocated to Pass., $192.00; Com. $2,775.60. Pass. Pro. of Com. 34.23% Intra., 61.05%; Inter., 38.95%	1,142.09	697.25	444.84
*Miscellaneous Revenue—Pass. 34.23% " " " "	1,621.43	989.88	631.55
Joint Facility Revenue (Bal. Cr.) " " " "	1,115.46	559.78	555.68
	$933,034.42	$569,546.81	$363,487.61
Outside Operations — Sleeping Cars — Gross Revenue $26,262.23; Expenses 14,548.14 — Net Revenue	8,085.67	4,936.30	3,149.37
Outside Operations — Dining Cars — Gross Revenue $38,095.75; Expenses 31,724.17			
Hire of Equipment— Intra, 61.05%; Inter, 38.95%	1,844.72	1,126.20	718.52
*Interest, Passenger Pro. 34.23%— " " " "	3,851.10	2,351.10	1,500.00
Rents Received (Joint Facility)— Passenger, 34.23%— " " " "	13,859.76	8,461.38	5,398.38
Total Passenger Revenue—Michigan	$960,675.67	$586,421.79	$374,253.88

THIS PAG

Operating Expenses (Intra, part allocated, part assigned and balance on Passenger Train miles not equated)	584,819.38	339,282.75	245,536.63
Rents Paid (Joint Facility) $973.28 Interstate; balance Intra, 61.05%; Inter, 38.95%	14,929.58	8,520.32	6,409.26
	33.91	20.70	13.21
Rents Paid (Miscellaneous)—Intra, 61.05%; Inter, 38.95%	60,601.75	36,433.77	24,167.98
†Taxes	$660,384.62	$384,257.54	$276,127.08
Net Income	300,291.05	202,164.25	98,126.80
Estimated Loss by application of Act 276	170,524.11	111,293.10	59,231.01
Net Return	$129,766.94	$ 90,871.15	$ 38,895.79

*Telegraph Service, Miscellaneous Revenue and Common portion of Rents of Buildings, etc., Interest, divided between Passenger and Freight on revenue basis.

†Taxes assigned to Passenger on the basis of assignment of property to that service as shown in Exhibit 1, and to Intra and Inter Pass. on the basis of passenger miles in 1911.

E BOUND
COPY BOUND CLOSE IN CENTER

EXHIBIT 4.

Passenger Business in Michigan—Year ended June 30th, 1912.

			Total	Intrastate	Interstate
Revenue from Passengers—Intra, 64.94%; Inter, 35.06%, allocated			$805,532.49	$523,146.59	$282,385.90
Excess Baggage—Intra. and Inter. allocated			9,634.27	6,659.58	2,974.69
Mail Revenue—	Intra., 64.94%; Inter., 35.06%		53,033.82	34,440.16	18,593.66
Express Revenue—	" " " "		28,563.36	18,549.05	10,014.31
Other Pass. Train Rev.—	" " " "		6,793.77	4,411.87	2,381.90
Milk Revenue on Pass. Trains—Intra. and Inter. allocated			423.31	423.31	
Special Service Train Revenue—	" " " "		2,701.37	1,478.50	1,222.87
Storage—Baggage—	Intra., 64.94%; Inter., 35.06%		23.75	15.42	8.33
Station and Train Privileges—	" " " "		494.54	321.15	173.39
†Telegraph, Passenger, 32.94%—	" " " "		200.98	130.52	70.46
†Rents of Buildings and Other Property—Allocated to Pass., $172.00; Com. $2,755.55. Pass. Pro. of Com. 32.94%	Intra., 64.94%; Inter., 35.06%		1,079.68	701.15	378.53
†Miscellaneous Revenue—Pass. 32.94%	" " " "		1,504.82	977.23	527.59
Joint Facility Revenue (Bal. Cr.)			1,115.46	583.44	532.02
			$911,101.62	$591,837.97	$319,263.65
Outside Operations — Sleeping Cars — Gross Revenue	$26,685.83				
Sleeping Cars — Expenses	17,506.87	Net Revenue	3,224.45	2,093.95	1,130.50
Dining Cars — Gross Revenue	$29,908.08				
Dining Cars — Expenses	35,862.59				
Hire of Equipment—	Intra, 64.94%; Inter, 35.06%		1,312.50	852.34	460.16
†Interest Passenger, 32.94%—	" " " "		4,024.67	2,613.62	1,411.05
Rents Received (Joint Facility)—	" " " "		13,566.96	8,810.38	4,756.58
Total Passenger Revenue (Michigan)			$933,230.20	$606,208.26	$327,021.94

Operating Expenses (Intra, part allocated, part assigned, balance on passenger miles not equated)	601,697.27	368,903.85	232,793.42
Rents Paid (Joint Facility) $601.88 allocated interstate. Balance Intra., 64.94%; Inter., 35.06%	7,463.00	4,455.62	3,007.39
Rents Paid (Miscellaneous)—Intra., 64.94%; Inter., 35.06%	34.40	22.34	12.06
*Taxes—Intra, 63.63%; Inter., 36.37%	61,096.10	38,875.45	22,220.65
	$670,200.77	$412,257.25	$258,033.52
Net Income	$262,939.43	$193,951.01	$ 68,088.42
Estimated Loss by application of Act 276	$174,311.11	$123,097.97	$ 51,213.14
Net Return	$ 88,628.32	$ 70,853.04	$ 17,775.28

†Telegraph Service, Miscellaneous Revenue and Common portion of Rents of Buildings, etc., Interest, divided between Passenger and Freight on revenue basis.

*Taxes assigned to Passenger on the basis of the assignment of property to that service as shown in Exhibit 1, and to Intra and Inter Passenger on the basis of passenger miles in 1912.

EXHIBIT 5.

Passenger Business in Michigan—Year ended June 30th, 1913.

	Total	Intrastate	Interstate
Revenue from Passengers—Intra, 66.61%; Inter, 33.39%, allocated	$841,534.76	$560,539.36	$280,995.40
Excess Baggage—Intra. and Inter. allocated	8,780.75	5,883.92	2,896.83
Mail Revenue— Intra., 66.61%; Inter., 33.39%	53,010.24	35,310.12	17,700.12
Express Revenue— " " " "	29,776.26	19,833.97	9,942.29
Other Pass. Train Rev.— " " " "	7,509.09	5,001.80	2,507.29
Milk Revenue on Pass. Trains—Intra. and Inter. allocated	404.80	404.80	
Special Service Train Revenue— " " " "	2,970.56	2,520.96	449.60
Storage—Baggage— Intra., 66.61%; Inter., 33.39%	49.20	32.77	16.43
Station and Train Privileges— " " " "	496.24	330.55	165.69
†Telegraph Service, Pass., 31.89%— " " " "	218.99	145.87	73.12
†Rents of Buildings and Other Property—Allocated to Pass., $132.00; Com. $2,724.00. Pass. Pro. 31.89%; Intra., 66.61%; Inter., 33.39%; (Pass. Pro. of Com. $868.68)	1,000.68	666.56	334.12
†Miscellaneous Rev.—Pass. 31.89%; Intra., 66.61%; Inter., 33.39%	1,587.59	1,057.50	530.09
Joint Facility Revenue (Bal. Cr.)	1,022.46	621.77	400.59
	$948,361.62	$632,349.95	$316,011.67
Outside Operations — Sleeping Cars — Gross Revenue $30,243.11; Expenses 17,911.30 — Net Revenue	2,994.20	1,994.44	999.75
Outside Operations — Dining Cars — Gross Revenue $34,516.40; Expenses 43,854.01			
Hire of Equipment— Intra, 66.61%, Inter, 33.39%	285.17	189.95	95.22
†Interest— " " " "	3,322.93	2,213.40	1,109.53
Rents Received (Joint Facility) " " " "	7,361.06	4,903.20	2,457.86
	$962,324.98	$641,650.94	$320,674.04

Operating Expenses (Intra, part allocated, part assigned, and balance on passenger miles)	674,308.95	435,067.10	239,241.85
Less Adjustment for Abnormal Expenses due to Deferred Maintenance	42,374.00	27,789.00	14,585.00
	$631,934.95	$407,278.10	$224,656.85
Rents Paid (Joint Facility) $573.09 Interstate, balance Intra., 66.61%, Inter., 33.39%	1,986.44	941.43	1,045.01
Rents Paid (Miscellaneous) All Freight	61,303.80	40,203.03	21,100.77
*Taxes—Intra., 65.58%; Inter., 34.42%			
	$695,225.19	$448,422.56	$246,802.63
Net Income	$267,099.79	$193,228.38	$ 73,871.41
Estimated Loss by application of Act 276	$178,536.08	$127,790.65	$ 50,745.43
Net Return	$ 88,563.71	$ 65,437.73	$ 23,125.98

†Telegraph Service, Miscellaneous Revenue and Common portion of Rents of Buildings, etc., Interest divided between Passenger and Freight on revenue basis.

*Taxes assigned to Passenger, Intra. Passenger and Inter Passenger on the basis of the assignments of property to those services as shown in Exhibit 1.

EXHIBIT 6.

Operating Expenses—Years 1910, 1911, 1912, 1913. Method of Division between States.

Acct. No.	OPERATING EXPENSES: MAINTENANCE OF WAY & STRUCTURES:	Proportion of total actually located 1910 Per Cent	1911 Per Cent	1912 Per Cent	1913 Per Cent	Balance divided	Method of Apportionment of Michigan Proportion of Expenses to Passenger and Freight business—See Note 15
1.	Superintendence	35.7	53.5	43.8	28.1	On track miles	See Note 1
2.	Ballast	100	100	100	100		Common, Mich. modified revenue train miles
3.	Ties	100	100	100	100		" " " " " "
4.	Rails	100	100	100	100		" " " " " "
5.	Other Track Material	100	100	100	100		" " " " " "
6.	Roadway and Track	100	100	100	100		" " " " " "
7.	Removal of Snow, Sand and Ice	99	99.7	100	100	On track miles	" " " " " "
9.	Bridges, Trestles and Culverts	97.7	92	99	97.7	On track miles	" " " " " "
10.	Over and Under Grade Crossings	100	100	100	100		" " " " " "
11.	Grade Crossings, Fences, Cattle Guards and Signs	100	100	99	99	On track miles	" " " " " "
12.	Snow and Sand, Fences and Snowsheds	100	100	100	100		" " " " " "
13.	Signals and Interlocking Plants	97.8	92	94.4	99	On track miles	" " " " " "
14.	Telegraph and Telephone Lines	4	5	2.3	19	On miles of wire	" " " " " "
16.	Buildings, Fixtures and Grounds	96	96.1	98.5	99	On track miles	See Note 2
17.	Docks and Wharves	100	100	100	100		See Note 3
18.	Roadway Tools and Supplies	.....	.....	.....	.....	On track miles	See Note 1
19.	Injuries to Persons	100	100	100	100		Common, Mich. modified revenue train miles
20.	Stationery and Printing	.....	.....	.....	.....	On track miles	See Note 1
21.	Other Expenses	.....	.....	.....	.....	On track miles	See Note 1
22.	Maint. Joint Tracks, Yards and Other Facilities—Dr.	100	100	100	100		See Note 4
23.	Maint. Joint Tracks, Yards and Other Facilities—Cr.	100	100	100	100		Common, Mich. modified revenue train miles
	MAINTENANCE OF EQUIPMENT						
24.	Superintendence					On Revenue locomotive miles	See Note 5
25.	Steam Locomotives—Repairs					See Note 6	See Note 6
26.	Steam Locomotives—Renewals					On Revenue locomotive miles	
27.	Steam Locomotives—Depreciation					On revenue locomotive miles	See Note 7
31.	Passr. Train Cars—Repairs					On passenger car miles	All passenger
33.	Passr. Train Cars—Depreciation					On passenger car miles	All passenger
34.	Frt. Train Cars—Repairs					On freight car miles	All freight

THIS PAG
VERTICAL

35.	Frt. Train Cars—Renewals	On freight car miles	All freight
36.	Frt. Train Cars—Depreciation	On freight car miles	All freight
43.	Work Equipment—Repairs	On track mileage	See Note 8
44.	Work Equipment—Renewals	On track mileage	See Note 8
45.	Work Equipment—Depreciation	On track mileage	See Note 8
46.	Shop Machinery and Tools	On revenue train miles	See Note 5
48.	Injuries to Persons	Actually located	See Note 5
49.	Stationery and Printing	On revenue train miles	See Note 5
51.	Maint. Joint Equipment at Terminals —Dr.	Actually located	Allocated
	TRAFFIC EXPENSES		
53.	Superintendence	Passenger items on passr. train miles	Allocated
54.	Outside Agencies	Freight items on freight train miles	Allocated
55.	Advertising	Passenger items on passr. train miles Freight items on freight train miles Joint items on revenue train miles	1910-99% allocated; 1% Mich. modified revenue train miles 1911, 1912, 1913, allocated.
56.	Traffic Associations	Passenger items on passr. train miles	Allocated
57.	Fast Freight Lines	Freight items on freight train miles	Allocated
58.	Industrial and Immigration Bureaus	Freight Train Miles	All freight
59.	Stationery and Printing	On revenue train miles Passenger items on passr. train miles Freight items on freight train miles Joint items on revenue train miles	On gross revenue basis 1910-93% allocated; 7% Michigan modified revenue miles 1911, 1912, 1913, allocated
	TRANSPORTATION EXPENSES:		
61.	Superintendence	On revenue train miles	See Note 9
62.	Dispatching Trains	1910, 26%; 1911, 19%; 1912, 19.9%; 1913, 17.3%; actually located. Balance on revenue train miles	See Note 10
63.	Station Employees	Actually located	See Note 11
64.	Weighing and Car Service Associations	Freight train miles	All freight
65.	Coal and Ore Docks	Actually located	All freight
66.	Station Supplies and Expenses	On ratio of "Station Employees" Acct.	On the ratio of "Station Employees" Acct. No. 63
67.	Yardmasters and their Clerks	Actually located	In 1910, 1911 and 1912 3.68% passenger. In 1913 3.9% passenger; balance freight (Thompson's Ratio 13A.)
68.	Yard Conductors and Brakemen	Actually located	
69.	Yard Switch and Signal Tenders	Actually located	
70.	Yard Supplies and Expenses	Actually located	
71.	Yard Enginemen	Actually located	
72.	Enginehouse Expenses—Yard	Actually located	
73.	Fuel for Yard Locomotives	Actually located	

EXHIBIT 6.

Operating Expenses—Years 1910, 1911, 1912, 1913. Method of Division between States.
Method of Apportionment of Michigan Proportion of Expenses to Passenger and Freight Business.

TRANSPORTATION EXP.—Contd.

Acct. No.			
74.	Water for Yard Locomotives	Actually located	In 1910, 1911 and 1912 3.68% passenger. In 1913 3.9% passenger; balance freight (Thompson's Ratio 13A)
75.	Lubricants for Yard Locomotives	Actually located	Allocated
76.	Other Supplies for Yard Locomotives	Actually located	See Note 10
77.	Operat'g Jt. Yds. and Terml.—Dr.	Actually located	Allocated
78.	Operat'g Jt. Yds. and Terml.—Cr.	Actually located	On ratio of engine housings. Thompson's Ratio 7
80.	Road Enginemen	On revenue locomotive miles	Allocated
81.	Enginehouse Expenses—Road	On revenue locomotive miles	On ratio of "Fuel for Road Locomotives" Account
82.	Fuel for Road Locomotives	See Note 12	On ratio of "Fuel for Road Locomotives" Account
83.	Water for Road Locomotives	On the ratio of "Fuel for Road Locomotives" Account	On ratio of "Fuel for Road Locomotives" Account
84.	Lubricants for Road Locomotives	On the ratio of "Fuel for Road Locomotives" Account	Allocated
85.	Other Supplies for Road Locomotives	On the ratio of "Fuel for Road Locomotives" Account	Allocated
88.	Road Trainmen	On revenue train miles	Mich. modified revenue train miles
89.	Train Supplies and Expenses	On revenue train miles	See Note 13
90.	Interlockers, Block and Other Signals —Operation	Actually located	Allocated.
91.	Crossing Flagmen and Gatemen	Actually located	See Note 10
93.	Clearing Wrecks	Actually located	See Note 9
94.	Telegraph and Telephone—Operation	Actually located	1910, 89.1%; 1911, 99%; 1912, 86%; 1913, 66.6%. Allocated. Balance—see Note 9
97.	Stationery and Printing	On revenue train miles	All freight
98.	Other Expenses	1910, 99%; 1911, 92.6%; 1912, 90.5%; 1913, 53.4% actually located. Balance on revenue train miles	All passenger
99.	Loss and Damage—Freight	On freight train miles	1910, 13%; 1911, 19%; 1912, 18.4%; 1913, none, allocated. Common as stated in Note 10
100.	Loss and Damage—Baggage	Actually located	
101.	Damage to Property	Actually located	

102.	Damage to Stock on Rt. of Way	Actually located	Allocated
103.	Injuries to Persons	Actually located	1910, 97%; 1911, 91.7%; 1912, 91.3%; 1913, 99%; allocated. Common as stated in Note 10
104.	Operating Joint Tracks—Dr.	Actually located	1910, Mich. modified rev. train miles; 1911, 79.5%; 1912, 54.9%; 1913, 97.3%; allocated. Common as stated in Note 10
105.	Operating Joint Tracks—Cr.	Actually located	1910, Mich, modified rev. train miles; 1911, 88%; 1912, 83%; 1913, 86.9%; allocated. Common as stated in Note 10
	GENERAL EXPENSES:		
106.	Salaries and Exps. of Gen. Officers	On revenue train miles	See Note 14
107.	Salaries and Exps. of Clerks and Attendants	On revenue train miles	See Note 14
108.	General Office Supplies and Expenses	On revenue train miles	See Note 14
109.	Law Expenses	On revenue train miles	Expense this suit excluded
110.	Insurance	On structures actually located; on equipment, mileage made by each class of equipment insured	1910, 60%; 1911, 52%; 1912, 47.9%; 1913, 50%; allocated. See Note 14.
112.	Pensions	On revenue train miles	See Note 14
113.	Stationery and Printing	On revenue train miles	See Note 14
114.	Other Expenses	On revenue train miles	See Note 14
115.	General Administration Joint Tracks and Terminals—Dr.	Actually located	Allocated
	General Administration Joint Tracks and Terminals—Cr.	None	

Note 1. Accounts Nos. 1 "Superintendence," 18 "Roadway Tools and Supplies," 20 "Stationery and Printing," 21 "Other Expenses," are divided on percentages arrived at from the totals resulting from the division of accounts Nos. 2 to 14, 16, 17, 19, 22 and 23.

Note. 2. "Coal Sheds and Trestles," "Water Tanks and Pump Houses," divided between Passenger and Freight on basis of fuel for locomotives (Yard and Road), "Track Scales" allocated to Freight. Station buildings used in common for both passenger and freight business, Marquette shops and storehouses and repairs of all other buildings used commonly in both services divided between passenger and freight on Michigan modified revenue train miles.

Note 3. The ferry slip dock at St. Ignace, Mich., is the only dock over which any passenger business passes. The cost of repairs to this dock is divided on basis of passenger and freight cars ferried, counting two freight cars equal to one passenger car.

Note 4. Passenger Facilities and Freight Facilities allocated. Facilities used in common by passenger and freight. Michigan modified revenue train miles.

EXHIBIT 6.

Operating Expenses—Years 1910, 1911, 1912, 1913.

Note 5. Accounts Nos. 24 "Superintendence," 46 "Shop Machinery and Tools," 48 "Injuries to Persons," 49 "Stationery and Printing," are divided on percentages arrived at from the totals resulting from the division of Accounts 25, 26, 27, 31, 33, 34, 35, 36, 43, 44 and 45.

Note 6. The cost of repairs to each locomotive was ascertained and apportioned to the various classes of service (Passenger, Freight, Mixed, Switching) according to the number of miles run in each service by each locomotive. The cost of repairs in each class of service was divided between states on basis of locomotive miles of like class in each state. 25% "Mixed" and 3.68% of "Switching" locomotive cost in Michigan was assigned to Passenger.

Note 7. To Passenger, all depreciation computed on passenger locomotives and 3.68% of depreciation computed on switching locomotives. Balance to Freight.

Note 8. Of the total Michigan cost there was first assigned to Freight: for 1910-12.51%, 1911-12.49%, 1912-12.59% and 1913-12.25%, being the proportion of the total cost attributable to the use of the work equipment in maintaining the exclusive freight tracks. The percentage used for each year is the percentage that the cost of maintaining the exclusive freight tracks is of the total cost of Maintenance of Way and Structures in the same year. The remainder of the cost being common is divided on Mich. modified revenue train miles.

Note 9. Accounts Nos. 61 "Superintendence," 97 "Stationery and Printing," and common portion of 98 "Other Expenses," divided on percentages arrived at from the totals resulting from the division of all other "Transportation Expenses" Accounts.

Note 10. The common portion of Accounts Nos. 62, 63, 78, 94, 101, 104 and 105 divided between passenger and freight on basis of Mich. Revenue Train Miles including switching as follows:

	1910 Miles	1911 Miles	1912 Miles	1913 Miles
Rev. Frt. Train Miles (incl. ore to Marq. Docks)	907,625	819,900	801,359	865,096
Frt. Road Switching at 6 miles per hour	193,068	193,068	193,068	193,068
Frt. Yard Switching	333,666	333,666	333,666	333,666
Total Freight	1,434,359	1,346,634	1,328,093	1,391,830
Rev. Pass. Train Miles	750,263	765,460	733,828	766,394
Pass. Yard Switching	13,541	13,541	13,541	13,541
	763,804	779,001	747,369	779,935
Passenger	34.7%	36.65%	36.01%	35.9%
Total	2,198,163	2,125,635	2,076,462	2,171,765

Note 11. The pay-rolls for June of each year were taken as being a fair average for the year. Employes engaged wholly in passenger service were assigned to "passenger." Those in joint passenger and freight service to "Common", divided between passenger and freight as stated in Note 10. The resulting percentages were applied to the total of the pay-rolls for the corresponding year. In order to test the correctness of this method, the pay-rolls for the entire year 1911 were divided in the same way, and the result differed but $26.50 in the amount charged to passenger cost from that obtained by dividing the rolls for the month of June, 1911, and multiplying the result by twelve.

Note 12. Record of cost of fuel to each locomotive is kept and apportioned each month to the various classes of service according to miles run in each service by each locomotive. The cost in each class of service divided between states on basis of locomotive miles of like class in each state.

Note 13. On ratio derived from combination Thompson's Ratio 13A and Complainant's Michigan Revenue Train Mile Ratio.

	1910		1911		1912		1913	
	Pass.	Frt.	Pass.	Frt.	Pass.	Frt.	Pass.	Frt.
13 A	3.68%	96.32%	3.68	96.32	3.68	96.32	3.90	96.32
Rev. T. Mile	45.22	54.78	48.28	51.72	47.80	52.20	46.98	53.02
							50.88	149.34
	48.90	151.10	51.96	148.04	51.48	148.52		
	24.45%		25.98%		25.74%		25.44%	

Note 14. The common expenses divided on percentages arrived at from the totals resulting from the division of "Maintenance of Way and Structures," "Maintenance of Equipment," "Traffic Expenses," and "Transportation Expenses."

Note 15. Of the total Maintenance of Way and Structures expenses, those portions thereof which represent the cost of maintenance of exclusive freight and exclusive passenger tracks, have been separately assigned to the respective services, as follows: It is established by the weight of the evidence in this case that the cost of maintenance of industrial spurs is not to exceed $300 per mile, and the cost of Maintenance of mine branches is not to exceed $375 a mile, and that on complainant's road the cost of maintenance of side tracks is not more than one-third of the cost of maintenance of main line tracks.

Cost of Maintenance of exclusive freight and exclusive passenger tracks in the year 1913.

			Miles		Miles
Main Line		Common track	413.77		
		Exclusive freight track	8.46		422.23
Side Tracks	Miles				
Freight and Ore	94.73	divided by 3=		equated	31.58
Passenger	1.88	divided by 3=		equated	.63
Common	38.15	divided by 3=			12.72
		Total Main Line and equated side tracks			467.16

EXHIBIT 6.

Operating Expenses—Years 1910, 1911, 1912, 1913.

Industrial Branches	34.66 miles at $300 per mile		$ 10,398.00
Mine	21.68 miles at $375 per mile		$ 8,130.00
Cost of maintenance of Industrial and Mine Branches (All Freight)			$ 18,528.00
Total Cost of Maintenance of Way and Structures, Mich. 1913		$560,534.24	
Less deferred Maintenance		102,148.00	$458,386.24
Less cost of maintenance of Industrial and Mine Branches			18,528.00
Cost of maintenance of Main Line and Side Tracks (477.16 sq. Miles)			$439,858.24
Cost of maintenance of Main Line and Side Tracks per mile			940.35
Cost of Maintenance of Freight and Ore Side Tracks 31.58 mi. at $940.35 per mile			29,696.25
Cost of maintenance of Industrial and Mine Branches			18,528.00
Cost of maintenance of Main Line exclusive of freight track 8.46 mi. at $940.35 per mile			7,955.36
Cost of maintenance of exclusive freight tracks			56,179.61
Cost of maintenance of exclusive passenger tracks .63 mi. at $940.35 per mile			592.42

The cost of maintenance of exclusive freight and exclusive passenger tracks in the years 1910, 1911, and 1912 was determined in the manner shown above for 1913, using the following:

	1910		1911		1912	
	Miles	Cost per mi.	Miles	Cost per mi.	Miles	Cost per mi.
Industrial Branches	28.25	$300	27.34	$300	38.88	$300
Mine Branches	22.00	$375	22.00	$375	21.68	$375

	—1910—	—1911—	—1912—
	Miles	Miles	Miles
Side Tracks:			
Freight and Ore	99.24	99.24	95.04
Passenger	.77	.77	.92
Common	32.99	32.99	35.60
Total cost of Maintenance of Way and Structures	$422,748.02	$416.872.21	$453,865.03

THIS PAG

EXHIBIT 7.

SUMMARY OF MICHIGAN PASSENGER BUSINESS.

FISCAL YEAR 1913—	Total Michigan	Michigan Intrastate	Michigan Interstate
Net Return, Exhibit 5 (Mail and Express included)	$ 88,563	$ 65,438	$ 23,125
Mail and Express, Gross Revenue, Exhibit 5	82,786	55,144	27,642
Mail and Express, Operating Expenses	69,815	46,575	23,240
Mail and Express, Taxes	6,737	4,418	2,319
Mail and Express, Total Expenses and Taxes	$ 76,552	$ 50,993	$ 25,559
Mail and Express Net Return	6,234	4,151	2,083
Passenger Net Return (Mail and Express excluded)	82,329	61,287	21,042
	Total	**Intrastate**	**Interstate**
Michigan Passenger Valuation, including Mail and Express, Exhibit 1	$4,206,217	$2,741,872	$1,464,345
Mail and Express Valuation, Michigan	462,292	301,341	160,951
Michigan Passenger Valuation, Mail and Express excluded	$3,743,925	$2,440,531	$1,303,394
Fiscal Years 1910 to 1913, Inclusive—	Total Michigan	Intrastate	Interstate
1910 Passenger Net Return, Mail and Express included, Exhibit 2	$ 180,002	$ 108,029	$ 71,973
1911 " " " " " " " " 3	129,766	90,871	38,895
1912 " " " " " " " " 4	88,628	70,853	17,775
1913 " " " " " " " " 5	88,564	65,438	23,126
Total 1910 to 1913, inclusive, " " " "	$ 486,960	$ 335,191	$ 151,769
Mail and Express Gross Revenue, 1910 to 1913, incl., Exhibits 2, 3, 4, 5	337,376	209,696	127,680
Mail and Express Operating Expenses, 1910 to 1913, inclusive	257,544	169,495	88,049
Mail and Express Taxes— 1910 to 1913, inclusive	27,090	16,609	10,481
Mail and Express Expenses and Taxes, 1910 to 1913, inclusive	$ 284,634	$ 186,104	$ 98,530
Mail and Express Net Revenue, 1910 to 1913, inclusive	$ 52,742	$ 23,592	$ 29,150
Passenger Net Return, Mail and Express, excluded, 1910 to 1913, incl.	$ 434,218	$ 311,599	$ 122,619
Average one year	$ 108,554	$ 77,899	$ 30,655

EXHIBIT 8.

FREIGHT BUSINESS IN MICHIGAN.

FISCAL YEAR 1913—	Total	Intrastate	Interstate
Freight Revenue	$2,042,286	$ 638,887	$1,403,399
Operating Expenses (Less adjustment for abnormal expenses due to deferred maintenance)	$1,486,067	$ 509,026	$ 977,041
Rents Paid (Joint Facilities)	8,486	2,140	6,346
Hire of Equipment	45,454	16,568	28,886
Rents Paid, Miscellaneous	76	28	48
Taxes	139,269	35,346	103,923
Total Freight Expenses, Rents and Taxes	$1,679,352	$ 563,108	$1,116,244
1913 Net Income	$ 362,934	$ 75,779	$ 287,155

FISCAL YEAR 1912—	Total	Intrastate	Interstate
Freight Revenue	$1,878,856	$ 556,994	$1,321,862
Operating Expenses	$1,375,680	$ 434,903	$ 940,777
Rents Paid (Joint Facility)	7,807	2,850	4,957
Rents Paid, Miscellaneous	*251	92	159
Taxes	138,802	35,228	103,574
Total Expenses, Rents and Taxes	$1,522,540	$ 473,073	$1,049,467
1912 Net Income	$ 356,316	$ 83,921	$ 272,395
Net Income, Freight, 1912 and 1913	$ 719,250	$ 159,700	$ 559,550
Net Income, Freight, Average 1 year	$ 359,625	$ 79,850	$ 279,775

MICHIGAN VALUATION, FREIGHT—1913

Exclusive Freight, Ex. 1, p. 1		$4,417,428
Frt. pro. of Common other than in Schedule 19 to 23, 42, 43, 37 and 40 (58.09% of $7,502,641)		4,358,285
Frt. pro. of Common in Schedules 19, 20, 21, 22, 23, 42, 43—	Total $843,219	577,758
(Ex. 1, p. 2) Less Pass	265,466	
Frt. pro. of 37 Cont. 68.53% of $400,000		274,120
Frt. pro. of 40 Taxes 68.14% of $100,000		68,140
		$9,695,721

ASSIGNMENT TO INTRASTATE AND INTERSTATE.

	Total		Intrastate		Interstate
Freight pro. of Soo Bridge property (All inter.) 57.97% of $60,271	$ 35,012		.....		$ 35,012
Marquette Ore Docks (all inter.)	392,980	%	.....	%	392,980
Remainder of Freight Valuation	$9,267,729	26.48	$2,454,095	73.52	$6,813,634
	$9,695,721		$2,454,095		$7,241,626

OPERATING EXPENSES IN MICHIGAN OF THE

Duluth, South Shore & Atlantic Railway Company

for the Fiscal Year 1910 and the portion thereof assigned to the Passenger Business.

MAINTENANCE OF WAY AND STRUCTURES

Acct. No.	Total Opr. Exps. Mich.	Allocated or definitely assigned to Pass.	Common Pass. & Frt.	Per Cent.	Pro. of Com. assigned to Pass.	Total Michigan Passenger
1	$ 14,027.34	.....	$ 14,027.34	38.25%	$ 5,365.46	$ 5,365.46
2	2,076.01	.....	2,076.01	40.45%	839.75	839.75
3	71,063.44	.....	71,063.44	40.45%	28,745.16	28,745.16
4	14,466.96	.....	14,466.96	40.45%	5,851.89	5,851.89
5	27,335.84	.....	27,335.84	40.45%	11,057.35	11,057.35
6	200,665.44	.....	200,665.44	40.45%	81,169.17	81,169.17
7	26,626.99	.....	26,626.99	40.45%	10,770.62	10,770.62
9	12,869.71	.....	12,869.71	40.45%	5,205.80	5,205.80
10	177.66	.....	177.66	40.45%	71.86	71.86
11	5,856.78	.....	5,856.78	40.45%	2,369.07	2,369.07
12	401.93	.....	401.93	40.45%	162.58	162.58
13	265.54	.....	265.54	40.45%	107.41	107.41
14	2,418.65	.....	2,418.65	40.45%	978.34	978.34
16	23,959.88	847.27	20,231.00	Spl.	7,161.80	8,009.07
17	14,473.13	.....	842.92	Spl.	148.35	148.35
18	4,586.70	.....	4,586.70	38.25%	1,754.41	1,754.41
19	910.40	.....	598.40	40.45%	242.05	242.05
20	399.78	.....	399.78	38.25%	152.92	152.92
21	11.79	.....	11.79	38.25%	4.51	4.51
22	9,293.87	2,399.79	27.64	40.45%	11.18	2,410.97
23	* 9,139.82	.....	9,139.82	40.45%	3,697.06	3,697.06
	$ 423,748.02	$ 3,247.06	$395,810.70	.....	$158,472.62	$161,719.68
Changes made by allocating cost of maint. of exclusive frt. and pass. tracks.—Add		226.26				
Deduct			.....	.....	20,311.14	20,084.88

MAINTENANCE OF EQUIPMENT

24	9,135.95		9,135.95	21.24%	1,940.48	1,940.48
25	55,857.06	$22,148.63	.....	.....	.....	22,148.63
27	15,186.91	5,040.64	.....	.....	.....	5,040.64
31	26,776.00	26,776.00	.....	.....	.....	26,776.00
33	5,671.81	5,671.81	.....	.....	.....	5,671.81
34	102,652.44	.....	.....	.....	.....	.....
35	6,011.52	.....	.....	.....	.....	.....
36	42,616.14	.....	.....	.....	.....	.....
43	4,192.76	.....	3,668.25	40.45%	1,483.81	1,483.81
44	35.69	.....	31.28	40.45%	12.65	12.65
45	1,832.27	.....	1,603.05	40.45%	648.43	648.43
46	6,517.21	.....	6,517.21	21.24%	1,384.25	1,384.25
48	589.49	.....	267.99	21.24%	56.92	56.92
49	639.45	.....	639.45	21.24%	135.82	135.82
51	13.49	6.06	...	.....	.....	6.06
	$ 307,728.19	$59,643.14	$ 21,863.18		$ 5,662.36	$ 65,305.50

TRAFFIC EXPENSES

53	30,075.70	12,572.88	.....	.....	.....	12,572.88
54	46,686.80	33,966.43	.....	.....	.....	33,966.43
55	3,624.56	3,573.72	29.23	40.45%	11.82	3,585.54
56	200.78	8.53	.....	.....	.....	8.53
57	442.55	.....	.....	.....	.....	.....
59	9,016.51	3,230.56	649.45	40.45%	262.70	3,493.26
	$ 90,046.90	$53,352.12	$ 678.68		$274.52	$ 53,626.64

* Red.

TRANSPORTATION EXPENSES

Acct. No.	Total Opr. Exps. Mich.	Allocated or definitely assigned to Pass.	Common Pass. & Frt.	Per Cent.	Pro. of Com. assigned to Pass.	Total Michigan Passenger
61	13,433.39		13,433.39	25.39%	$3,410.74	$3,410.74
62	13,846.28		13,846.28	34.7 %	4,804.66	4,804.66
63	126,705.78	$ 8,040.90	64,305.65	34.7 %	22,314.06	30,354.96
64	1,289.23	.....	.....	.....	.....	.....
65	50,917.63	.....	.....	.....	.....	.....
66	7,934.34	.....	7,934.34	23.96%	1,901.07	1,901.07
67	5,190.99	190.99	.....	.....	.....	190.99
68	50,496.55	1,858.28	.....	.....	.....	1,858.28
69	5,673.34	208.78	.....	.....	.....	208.78
70	1,203.17	44.28	.....	.....	.....	44.28
71	31,502.42	1,159.28	.....	.....	.....	1,159.28
72	11,225.84	413.12	.....	.....	.....	413.12
73	30,711.12	1,130.16	.....	.....	.....	1,130.16
74	1,093.60	40.24	.....	.....	.....	40.24
75	369.64	13.61	.....	.....	.....	13.61
76	694.22	25.54	.....	.....	.....	25.54
77	14,070.02	4,266.29	.....	.....	.....	4,266.29
78	11,232.18	.....	4,067.45	34.7%	1,411.40	1,411.40
80	140,114.73	51,143.13	.....	.....	.....	51,143.13
81	32,053.28	.....	32,053.28	37.34%	11,968.69	11,968.69
82	257,240.47	73,792.22	.....	.....	.....	73,792.22
83	9,520.82	2,730.86	.....	.....	.....	2,730.86
84	2,847.42	816.72	.....	.....	.....	816.72
85	3,613.19	1,036.37	.....	.....	.....	1,036.37
88	165,389.36	45,189.58	.....	.....	.....	45,189.58
89	23,689.34	17,125.56	.....	.....	.....	17,125.56
90	46.82	.....	46.82	40.45%	18.94	18.94
91	8,758.87	.....	8,758.87	24.45%	2,141.54	2,141.54
93	2,310.95	.....	.....	.....	.....	.....
94	136.98	.....	136.98	34.7 %	47.53	47.53
97	8,285.91	.....	8,285.91	25.39%	2,103.79	2,103.79
98	344.73	41.21	37.58	25.39%	9.54	50.75
99	5,730.55	.....	.....	.....	.....	.....
100	117.25	117.25	.....	.....	.....	117.25

101	1,899.38	.....	1,643.30	34.7 %	570.23	570.23
102	142.90	145.40	...	.....	.....	145.40
103	9,523.85	2,658.50	268.50	34.7 %	93.17	2,751.67
104	88.86	.....	88.86	34.7 %	30.83	30.83
105	* 3,044.86	.....	867.05	34.7 %	300.87	300.87
	$1,023,935.20	$212,188.27	$145,905.26		$ 47,702.52	$259,890.79

GENERAL EXPENSES

106	19,399.65	.....	19,399.65	28.22%	5,474.58	5,474.58
107	26,931.73	.....	26,931.73	28.22%	7,600.13	7,600.13
108	2,592.07	.....	2,592.07	28.22%	731.48	731.48
109	5,186.07	.....	5,186.07	28.22%	1,463.51	1,463.51
110	4,649.56	446.38	2,772.99	28.22%	782.54	1,228.92
112	288.11	.....	288.11	28.22%	81.30	81.30
113	3,978.73	.....	3,978.73	28.22%	1,122.80	1,122.80
114	2,667.46	.....	2,321.49	28.22%	655.12	655.12
115	118.04	36.91	.....	.....	.....	36.91
	$ 65,811.42	$ 483.29	$ 63,470.84		$17,911.46	$ 18,394.75

SUMMARY—1910.

	Total Opr. Exp. Mich.	Allocated or definitely assigned to Pass.	Common Pass. & Freight	Pro. of Com. assigned to Passenger	Total Michigan Passenger	Total Michigan Freight
Maint. of Way and Structures	$ 422,748.02	$ 3,473.32	$395,810.70	$138,161.48	$141,634.80	
Maintenance of Equipment	307,728.19	59,643.14	21,863.18	5,662.36	65,305.50	
Traffic Expenses	90,046.90	53,352.12	678.68	274.52	53,626.64	
Transportation Expenses	1,023,935.20	212,188.27	145,905.26	47,702.52	259,890.79	
General Expenses	65,811.42	483.29	63,470.84	17,911.46	18,394.75	
TOTAL	$1,910,269.73	$329,140.14	$627,728.66	$209,712.34	$538,852.48	$1,371,417.25

* Red.

OPERATING EXPENSES IN MICHIGAN OF THE

Duluth, South Shore & Atlantic Railway Company

for the Fiscal Year 1911 and the proportion thereof assigned to the Passenger Business.

MAINTENANCE OF WAY AND STRUCTURES

Acct. No.	Total Opr. Exps. Mich.	Allocated or definitely assigned to Pass.	Common Pass. & Frt.	Per Cent.	Pro. of Com. assigned to Pass.	Total Michigan Passenger
1	$ 13,976.58	.....	$ 13,976.58	38.45%	$ 5,374.00	$ 5,374.00
2	1,992.19	.....	1,992.19	42.94%	855.45	855.45
3	43,886.18	.....	43,886.18	42.94%	18,844.72	18,844.72
4	7,019.21	.....	7,019.21	42.94%	3,014.04	3,014.04
5	23,431.32	.....	23,431.32	42.94%	10,061.41	10,061.41
6	192,083.37	.....	192,083.37	42.94%	82,480.60	82,480.60
7	37,642.68	.....	37,642.68	42.94%	16,163.77	16,163.77
9	12,481.01	.....	12,481.01	42.94%	5,359.35	5,359.35
10	656.11	.....	656.11	42.94%	281.73	281.73
11	6,162.52	.....	6,162.52	42.94%	2,646.19	2,646.19
12	270.74	.....	270.74	42.94%	116.26	116.26
13	83.45	.....	83.45	42.94%	35.83	35.83
14	2,541.69	.....	2,541.69	42.94%	1,091.40	1,091.40
16	34,304.27	947.39	32,281.33	Spl.	11,611.54	12,558.93
17	34,665.62	.....	37.34	Spl.	6.58	6.58
18	4,451.02	.....	4,451.02	38.45%	1,711.42	1,711.42
19	584.50	150.00	396.00	42.94%	170.04	320.04
20	400.78	.....	400.78	38.45%	154.10	154.10
21	132.92	.....	132.92	38.45%	51.10	51.10
22	11,312.64	3,961.58	1.69	42.94%	.73	3,962.31
23	* 11,206.59	.....	11,206.59	42.94%	4,812.11	4,812.11
	$ 416,872.21	$ 5,058.97	$368,721.54	.....	$155,218.15	$160,277.12
Changes made by allocating cost of exclusive freight and pass. tracks.—Add		223.14	.....	.....	.....	.....
Deduct			.....	.....	20,119.36	19,896.22
TOTAL....	$ 416,872.21	$ 5,282.11	$368,721.54	.....	$135,098.79	$140,380.90

MAINTENANCE OF EQUIPMENT

24	9,108.98	.....	9,108.98	25.71%	2,341.92	2,341.92
25	84,530.74	29,195.44	.....	.....	.....	29,195.44
27	15,580.40	5,139.83	.....	.....	.....	5,139.83
31	29,549.75	29,549.75	.....	.....	.....	29,549.75
33	5,712.26	5,712.26	.....	.....	.....	5,712.26
34	90,195.41	.....	.....	.....	.....	.....
35	505.91	.....	.....	.....	.....	.....
36	47,030.48	.....	.....	.....	.....	.....
43	3,382.14	.....	2,959.71	42.94%	1,270.90	1,270.90
44	18.91	.....	16.55	42.94%	7.11	7.11
45	1,796.83	.....	1,572.41	42.94%	675.19	675.19
46	10,334.04	.....	10,334.04	25.71%	2,656.88	2,656.88
48	338.23	62.50	237.23	25.71%	60.99	123.49
49	804.71	.....	804.71	25.71%	206.89	206.89
50	19.50	.....	19.50	25.71%	5.01	5.01
51	45.85	12.20	.....	.....	.....	12.20
	$ 298,954.14	$ 69,571.98	$ 25,053.13	.....	$ 7,224.89	$ 76,896.87

TRAFFIC EXPENSES

53	32,660.69	13,319.60	.....	.....	.....	13,319.60
54	49,113.21	37,170.83	.....	.....	.....	37,170.83
55	6,568.30	6,520.56	.....	.....	.....	6,520.56
56	174.48	10.91	.....	.....	.....	10.91
57	450.54	.....	.....	.....	.....	.....
58	247.48	.....	247.48	34.23%	84.71	84.71
59	8,816.51	4,010.01	.....	.....	.....	4,010.01
60	308.13	308.13	.....	.....	.....	308.13
	$ 98,339.34	$ 51,340.04	$ 247.48	.....	$ 84.71	$ 61,424.75

* Red.

101	3,687.13	125.00	2,979.65	36.65%	1,092.04	1,217.04
102	778.55	697.00	27.00	36.65%	9.90	706.90
103	7,592.58	44.00	542.50	36.65%	198.83	242.83
104	217.16	36.91	101.40	36.65%	37.16	74.07
105	* 3,698.74	358.95	812.94	36.65%	297.94	656.89
	$1,019,035.75	$235,778.75	$145,207.33	.....	$ 49,705.71	$285,484.46

GENERAL EXPENSES

106	20,776.66	.....	20,776.66	30.78%	6,395.06	6,395.06
107	27,977.95	.....	27,977.95	30.78%	8,611.61	8,611.61
108	2,435.43	.....	2,435.43	30.78%	749.63	749.63
109	4,988.48	.....	4,988.48	30.78%	1,535.45	1,535.45
110	5,111.95	361.94	2,821.14	30.78%	868.35	1,230.29
112	98.95	.....	98.95	30.78%	30.46	30.46
113	4,337.28	.....	4,337.28	30.78%	1,335.01	1,335.01
114	2,288.41	6.80	2,281.61	30.78%	702.28	709.08
115	131.32	35.81	.....	.....	.....	35.81
	$ 68,146.43	$ 404.55	$ 65,717.50	.....	$ 20,227.85	$ 20,632.40

SUMMARY—1911.

	Total Opr. Exp. Mich.	Allocated or definitely assigned to Pass.	Common Pass. & Freight	Pro. of Com. assigned to Passenger	Total Michigan Passenger	Total Michigan Freight
Maint. of Way and Structures	$ 416,872.21	$ 5,282.11	$368,721.54	$135,098.79	$140,380.90	
Maintenance of Equipment	298,954.14	69,671.98	25,053.13	7,224.89	76,896.87	
Traffice Expenses	98,339.34	61,340.04	247.48	84.71	61,424.75	
Transportation Expenses	1,019,035.75	235,778.75	145,207.33	49,705.71	285,484.46	
General Expenses	68,146.43	404.55	65,717.50	20,227.85	20,632.40	
TOTAL	$1,901,347.87	$372,477.43	$604,946.98	$212,341.95	$584.819.38	$1,316.528.49

* Red.

OPERATING EXPENSES IN MICHIGAN OF THE

Duluth, South Shore & Atlantic Railway Company

for the Fiscal Year 1912 and the portion thereof assigned to the Passenger Business.

MAINTENANCE OF WAY AND STRUCTURES

Acct. No.	Total Opr. Exps. Mich.	Allocated or definitely assigned to Pass.	Common Pass. & Frt.	Per Cent.	Pro. of Com. assigned to Pass.	Total Michigan Passenger
1	$ 13,816.83	.....	$ 13,816.83	37.70%	$ 5,208.94	$ 5,208.94
2	5,959.57	.....	5,959.57	42.36%	2,524.47	2,524.47
3	54,976.92	.....	53,976.92	42.36%	22,864.62	22,864.62
4	14,957.23	.....	14,957.23	42.36%	6,335.88	63,35.88
5	23,875.87	.....	23,875.87	42.36%	10,113.82	10,113.82
6	220,790.13	.....	220,790.13	42.36%	93,526.70	93,526.70
7	29,098.64	.....	29,088.64	42.36%	12,326.18	12,326.18
9	11,380.65	.....	11,380.65	42.36%	4,820.84	4,820.84
10	39.66	.....	39.66	42.36%	16.80	16.80
11	6,337.38	.....	6,337.38	42.36%	2,684.51	2,684.51
12	626.44	.....	626.44	42.36%	265.36	265.36
13	239.50	.....	239.50	42.36%	101.45	101.45
14	2,341.35	.....	2,341.35	42.36%	991.80	991.80
16	21,227.19	1,130.33	17,601.27	Spl.	6,957.31	8,077.64
17	44,036.56	.....	8,866.92	Spl.	2,295.47	2,295.47
18	4,802.23	.....	4,802.23	37.70%	1,810.44	1,810.44
19	427.65	.....	365.65	42.36%	154.89	154.89
20	381.77	.....	381.77	37.70%	143.93	143.93
21	116.33	.....	116.33	37.70%	43.86	43.86
22	10,644.41	1,411.42	362.46	42.36%	153.54	1,564.96
23	* 11,211.28	.....	11,211.28	.....	4,749.00	4,749.09
	$ 453,865.03	$ 2,531.75	$404,725.52	.....	$168,591.72	$171,123.47
Changes made by allocating cost of maint. of exclusive freight and pass. tracks—Add		288.70	.....	.....	.....	.....
Deduct			.....	.....	21,664.34	21,375.64
TOTAL....$	453,865.03	$ 2,820.45	$404,725.52	.....	$146,927.38	$149,747.83

MAINTENANCE OF EQUIPMENT

24	9,379.61	.....	9,379.61	24.16%	2,266.11	2,266.11
25	80,243.16	26,166.91	.....	.....	.....	26,166.91
26	45.52	45.52	.....	.....	.....	45.52
27	15,513.79	5,438.51	.....	.....	.....	5,438.51
31	27,916.92	27,916.92	.....	.....	.....	27,916.92
33	5,779.44	5,779.44	.....	.....	.....	5,779.44
34	98,793.56	.....	.....	.....	.....	.....
35	* 42.83	.....	.....	.....	.....	.....
36	46,971.09	.....	.....	.....	.....	.....
43	7,034.70	.....	6,149.03	42.36%	2,604.73	2,604.73
44	21.80	.....	19.06	42.36%	8.07	8.07
45	1,832.54	.....	1,601.82	42.36%	678.53	678.53
46	7,807.10	.....	7,807.10	24.16%	1,886.20	1,886.20
48	348.36	.....	328.61	24.16%	79.39	79.39
49	741.75	.....	741.75	24.16%	179.21	179.21
50	4.92	.....	4.92	24.16%	1.19	1.19
	$ 302,391.43	$ 65,347.30	$ 26,031.90	.....	$ 7,703.43	$ 73,050.73

TRAFFIC EXPENSES

53	29,920.65	11,918.97	.....	.....	.....	11,918.97
54	50,929.69	37,811.18	.....	.....	.....	37,811.18
55	4,043.35	4,006.66	.....	.....	.....	4,006.66
56	243.86	9.50	.....	.....	.....	9.50
57	393.84	.....	.....	.....	.....	.....
58	4,419.16	.....	.....	.....	.....	.....
59	9,971.79	2,963.18	.....	.....	.....	2,963.18
	$ 99,922.34	$ 56,709.49	$ 4,419.16	.....	$ 1,455.67	$ 58,165.16

* Red.

TRANSPORTATION EXPENSES

Acct. No.	Total Opr. Exps. Mich.	Allocated or definitely assigned to Pass.	Common Pass. & Frt.	Per Cent.	Pro. of Com. assigned to Pass.	Total Michigan Passenger
61	15,375.60	.....	15,375.60	28.52%	4,385.12	4,385.12
62	13,716.88	.....	13,716.88	36.01%	4,939.45	4,939.45
63	135,512.09	11,095.41	62,228.35	36.01%	22,408.43	33,503.84
64	1,330.63	.....	.....	.....	.....	.....
65	41,609.47	.....	.....	.....	.....	.....
66	9,376.13	.....	9,376.13	24.72%	2,317.78	2,317.78
67	4,734.15	174.22	.....	.....	.....	174.22
68	49,218.70	1,811.25	.....	.....	.....	1,811.25
69	4,671.15	171.90	.....	.....	.....	171.90
70	1,034.65	38.08	.....	.....	.....	38.08
71	32,270.85	1,187.57	.....	.....	.....	1,187.57
72	13,664.42	502.85	.....	.....	.....	502.85
73	28,685.42	1,055.62	.....	.....	.....	1,055.62
74	1,264.39	46.53	.....	.....	.....	46.53
75	314.71	11.58	.....	.....	.....	11.58
76	618.41	22.75	.....	.....	.....	22.75
77	17,070.25	5,607.15	.....	.....	.....	5,607.15
78	* 11,861.01	.....	4,033.58	36.01%	1,452.49	1,452.49
80	141,793.02	55,286.05	.....	.....	.....	55,286.05
81	34,940.93	.....	34,940.93	37.34%	13,046.94	13,046.94
82	263,415.38	90,525.30	.....	.....	.....	90,525.30
83	11,317.67	3,889.01	.....	.....	.....	3,889.01
84	2,361.38	811.42	.....	.....	.....	811.42
85	3,272.30	1,124.44	.....	.....	.....	1,124.44
88	169,657.87	52,275.23	.....	.....	.....	52,275.23
89	25,252.19	19,686.79	.....	.....	.....	19,686.79
90	25.52	.....	25.52	42.36%	10.81	10.81
91	8,717.83	.....	7,603.98	25.74%	1,957.26	1,957.26
93	2,559.21	185.47	.....	.....	.....	185.47

94	143.32	.....	143.32	36.01%	51.61	51.61
97	9,548.32	.....	9,548.32	28.52%	2,723.18	2,723.18
98	480.40	17.22	66.01	28.52%	18.85	36.05
99	6,660.29	.....	.....	.....	.....	.....
100	191.60	191.60	.....	.....	.....	191.60
101	520.10	252.00	125.00	36.01%	180.41	212.41
102	520.10	252.00	00	36.01%	45.01	297.01
103	8,956.48	2,020.47	780.86	36.01%	281.19	2,301.66
104	476.42	84.62	65.75	36.01%	23.68	108.30
105	* 3,893.69	851.44	662.16	.....	238.44	1,089.88
	$1,045,072.41	$247,255.09	$149,801.91	.....	$ 50,698.77	$297,953.86
GENERAL EXPENSES						
106	21,377.03	.....	21,377.03	30.45%	6,509.31	6,509.31
107	30,952.08	.....	30,952.08	.....	9,424.91	9,424.91
108	2,705.63	.....	2,705.63	.....	823.86	823.86
109	7,183.32	.....	7,183.32	.....	2,178.32	2,187.32
Cost of Suit	19,083.35	.....	.....	.....	.....	.....
110	5,959.85	474.28	3,103.92	.....	945.14	1,419.42
112	385.26	.....	385.26	.....	117.31	117.31
113	4,781.28	.....	4,781.28	.....	1,455.90	1,455.90
114	2,664.39	.....	2,676.89	.....	815.11	815.11
115	117.28	26.55	.....	.....	.....	26.55
	$ 95,209.47	$ 500.83	$ 73,165.41	.....	$ 22,278.86	$ 22,779.69

SUMMARY—1912

	Total Opr. Exp. Mich.	Allocated or definitely assigned to Pass.	Common Pass. & Freight	Pro. of Com. assigned to Passenger	Total Michigan Passenger	Total Michigan - Freight
Maint. of Way and Structures	$ 453,865.03	$ 2,820.45	$404,725.52	$146,927.38	$149,747.83	
Maintenance of Equipment	302,391.43	65,347.30	26,031.90	7,703.43	73,050.73	
Traffic Expenses	99,922.34	56,709.49	4,419.16	1,455.67	58,165.16	
Transportation Expenses	1,045,072.41	247,255.09	149,801.91	50,698.77	297,953.86	
General Expenses	95,209.47	500.83	73,165.41	22,278.86	22,779.69	
	$1,996,460.68	$372,633.16	$658,143.90	$229,064.11	$601,697.27	$1,375,680.06

* Red.

OPERATING EXPENSES IN MICHIGAN OF THE

Duluth, South Shore & Atlantic Railway Company

for the Fiscal Year 1913 and the portion thereof assigned to the Passenger Business.

MAINTENANCE OF WAY AND STRUCTURES

Acct. No.	Total Opr. Exps. Mich.	Allocated or definitely assigned to Pass.	Common Pass. & Frt.	Per Cent.	Pro. of Com. assigned to Pass.	Total Michigan Passenger
1	$ 26,585.00	.....	$ 26,585.00	38.46%	$ 10,224.59	$ 10,224.59
2	25,938.38	.....	25,938.38	41.91%	10,870.78	10,870.78
3	62,951.69	.....	62,951.69	41.91%	26,383.05	26,383.05
4	9,568.29	.....	9,568.29	41.91%	4,010.07	4,010.07
5	37,491.78	.....	37,491.78	41.91%	15,712.80	15,712.80
6	243,421.68	.....	243,421.68	41.91%	102,018.03	102,018.03
7	34,441.99	.....	34,441.99	41.91%	14,434.64	14,434.64
9	40,889.07	.....	40,889.07	41.91%	17,136.61	17,136.61
10	34.38	.....	34.38	41.91%	14.41	14.41
11	10,867.78	.....	10,867.78	41.91%	4,554.69	4,554.69
12	449.35	.....	449.35	41.91%	188.32	188.32
13	145.70	.....	145.70	41.91%	61.06	61.06
14	3,024.96	.....	3,024.96	41.91%	1,267.76	1,267.76
16	20,985.75	2,436.13	15,185.87	Spl.	5,352.37	7,788.50
17	37,241.97	.....	5,891.85	Spl.	1,224.33	1,224.33
18	7,090.71	.....	7,090.71	38.46%	2,727.09	2,727.09
19	1,139.15	.....	1,119.15	41.91%	469.04	469.04
20	1,157.85	.....	1,157.85	38.46%	445.31	445.31
21	82.37	.....	82.37	38.46%	31.68	31.68
22	8,065.28	640.20	62.23	41.91%	26.08	666.28
23	* 11,038.89	.....	11,038.89	.....	4,626.40	4,626.40
	$ 560,534.24	$ 3,076.33	$515,361.19	.....	$212,536.31	$215,602.64
Changes made by allocating cost of maint. of exclusive freight and pass. tracks—Add Deduct		592.42	...	.....	.....	.....
			.....	.....	21,834.54	21,242.12
TOTAL....$	560,534.24	$ 3,668.75	$515,361.19	.....	190,691.77	194,360.52

THIS PAGE

MAINTENANCE OF EQUIPMENT

24	10,124.12	.....	10,124.12	25.49%	2,580.64	2,580.64
25	93,484.84	30,376.42	...	.....	.....	30,376.42
26	865.85	25.43	...	.....	.....	25.43
27	15,498.51	5,538.68	...	.....	.....	5,538.68
31	34,678.99	34,678.99	...	.....	.....	34,678.99
33	5,984.95	5,984.95	...	.....	.....	5,984.95
34	111,017.97	.....	.....	.....	.....	.....
35	246.48	.....	.....	.....	.....	.....
36	45,048.86	.....	.....	.....	.....	.....
43	12,020.96	.....	10,548.39	41.91%	4,420.83	4,420.83
44	40.27	.....	35.34	41.91%	14.81	14.81
45	2,298.39	.....	2,016.84	41.91%	845.26	845.26
46	8,391.32	.....	8,391.32	25.49%	2,138.95	2,138.95
48	348.60	.....	348.60	25.49%	88.86	88.86
49	1,122.69	.....	1,122.69	25.49%	286.17	286.17
	$ 341,172.80	$ 76,604.47	$ 32,587.30	.....	$ 10,375.52	$ 86,979.99

TRAFFIC EXPENSES

53	26,912.28	11,134.99	.....	.....	.....	11,134.99
54	39,418.47	25,108.42	.....	.....	.....	25,108.42
55	4,864.16	4,786.59	.....	.....	.....	4,786.59
56	194.25	.....	.....	.....	.....	.....
57	589.16	.....	.....	.....	.....	.....
58	16,751.09	.....	16,751.09	31.89%	5,341.92	5,341.92
59	9,678.07	3,789.55	.....	.....	.....	3,789.55
	$ 98,407.48	$ 44,819.55	$ 16,751.09	.....	$ 5,341.91	$ 50,161.47

* Red.

TRANSPORTATION EXPENSES

Acct. No.	Total Opr. Exps. Mich.	Allocated or definitely assigned to Pass.	Common Pass. & Frt.	Per Cent.	Pro. of Com. assigned to Pass.	Total Michigan Passenger
61	17,484.62	.....	17,484.62	28.00%	4,895.69	4,895.69
62	14,911.94	.....	14,911.94	35.9 %	5,353.39	5,353.39
63	143,589.57	10,746.06	68,144.85	35.9 %	24,464.00	35,210.06
64	1,450.58	.....	.....	.....	.....	.....
65	33,719.49	.....	.....	.....	.....	.....
66	10,642.29	.....	10,642.29	.....	2,609.49	2,609.49
67	4,669.45	182.12	.....	.....	.....	182.12
68	54,034.55	2,107.35	.....	.....	.....	2,107.35
69	4,818.15	187.91	.....	.....	.....	187.91
70	1,246.50	48.61	.....	.....	.....	48.61
71	31,899.18	1,244.07	.....	.....	.....	1,244.07
72	14,477.15	564.60	.....	.....	.....	564.60
73	25,419.22	991.35	.....	.....	.....	991.35
74	1,184.75	46.21	.....	.....	.....	46.21
75	406.26	15.84	.....	.....	.....	15.84
76	611.30	23.84	.....	.....	.....	23.84
77	19,272.05	5,769.49	.....	.....	.....	5,769.49
78	12,759.28	.....	4,417.98	35.9 %	1,586.05	1,586.05
80	159,099.98	58,910.74	.....	.....	.....	58,910.74
81	39,316.24	.....	39,316.24	37.08%	14,578.46	14,578.46
82	302,691.12	96,063.93	.....	.....	.....	96,063.93
83	13,343.93	4,234.86	.....	.....	.....	4,234.86
84	3,091.91	981.25	.....	.....	.....	981.25
85	4,366.67	1,386.45	.....	.....	.....	1,386.45
88	182,909.63	55,635.72	.....	.....	.....	55,635.72
89	71,005.48	24,476.18	.....	.....	.....	24,476.18
90	81.02	.....	81.02	41.91%	33.96	33.96
91	8,201.65	.....	7,349.45	35.44%	1,859.70	1,859.70

94	189.33	.....	189.33	35.9 %	67.97	67.97
97	11,133.50	.....	11,133.50	28.00%	3,117.38	3,117.38
98	1,038.12	46.81	34.60	28.00%	9.60	56.50
99	6,372.12	.....	.....	.....	.....	.....
100	80.27	80.27	.....	.....	.....	80.27
101	1,912.89	.....	22.45	35.9 %	8.06	8.06
102	931.76	464.12	.....	.....	.....	.....
103	11,503.78	901.25	118.82	35.9 %	42.66	943.91
104	622.61	83.68	61.51	35.9 %	22.08	105.76
105	* 3,836.10	770.03	691.63	35.9 %	248.30	1,018.33
	$1,143,085.39	$264,601.65	$164,381.01	.....	$ 55,238.18	$319,839.83
GENERAL EXPENSES						
106	20,723.40	.....	30,725.40	30.40%	6,299.91	6,299.91
107	30,240.71	.....	30,240.71	.....	9,193.18	9,193.18
108	3,093.79	.....	3,093.79	30.40%	940.51	940.51
Cost of Suit	23,690.00	.....	.....	.....	.....	.....
109	7,677.66	.....	7,677.66	30.40%	2,334.01	2,334.01
110	5,976.60	452.57	2,980.78	.....	906.16	1,358.73
112	591.70	.....	591.70	.....	179.87	179.87
113	5,016.53	.....	5,016.53	.....	1,525.03	1,525.03
114	3,430.21	.....	3,318.85	.....	1,008.93	1,008.93
115	199.32	126.97	.....	.....	.....	126.97
	$ 100,639.92	$ 579.54	$ 73,643.42	.....	$ 22,387.60	$ 23,967.14

SUMMARY—1913

	Total Opr. Exp. Mich.	Allocated or definitely assigned to Pass.	Common Pass. & Freight	Pro. of Com. assigned to Passenger	Total Michigan Passenger	Total Michigan Freight
Maint. of Way and Structures	$ 560,534.24	$ 3,668.75	$515,361.19	$190,691.77	$194,360.52	
Maintenance of Equipment	341,172.80	76,604.47	32,587.36	10,375.52	86,979.99	
Traffic Expenses	98,407.48	44,819.55	16,751.08	5,341.92	50,161.47	
Transportation Expenses	1,143,085.39	264,601.65	164,381.01	55,238.18	319,839.83	
General Expenses	100,639.92	579.54	73,643.42	22,387.60	22,967.14	
	$2,343,839.83	$390,273.96	$802,724.01	$284,034.99	$674,308.95	$1,545,840.88

* Red.

DULUTH, SOUTH SHORE AND ATLANTIC RAILWAY

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS

MILEAGE OF MAIN LINE AND BRANCHES IN MICHIGAN

		First Main Track						Second Main Track					
		1911		1912		1913		1911		1912		1913	
	Mile Post	D.S.S. & A.	Apportioned to D.S.S. & A.	D.S.S. & A.	Apportioned to D.S.S. & A.	D.S.S. & A.	Apportioned to D.S.S. & A.	D.S.S. & A.	Apportioned to D.S.S. & A.	D.S.S. & A.	Apportioned to D.S.S. & A.	D.S.S. & A.	Apportioned to D.S.S. & A.
Sault Ste. Marie to Marquette	0.00 to 1.66		0.83		0.83		0.83		0.74		0.74		0.74
	1.66 to 154.00	152.34		152.34		152.34							
Total		152.34	0.83			152.34	0.83		0.74		0.74		0.74
St. Ignace to Soo Junction	0.00 to 42.97	42.97		42.97		42.97							
Total East of Marquette		195.31	0.83	195.31	0.83	195.31	0.83		0.74		0.74		0.74
Marquette to Nestoria North Line	154 to 200.90	46.90		46.90		46.90		5.08		5.08		5.08	
South Line—Marquette to Winthrop Junction	0.00 to 17.33	17.33		17.33		17.33							

Branches	Mile Post	1911 D.S.S. & A.	1911 Apportioned to D.S.S. & A.	1912 D.S.S. & A.	1912 Apportioned to D.S.S. & A.	1913 D.S.S. & A.	1913 Apportioned to D.S.S. & A.
Peninsula Bark & Lumber Co.	0		0.43		0.43		0.43
Bay Mills	12.4	In side tracks		1.42		1.22	
Deranson Lumber	20.1	2.64		Taken up		Taken up	
Fuller	31.8	Not in		Not in		2.20	
Seewhy	38.4	Not in		Not in		0.87	
Hunter	46.6	Not in		4.82		4.82	
Asylum	58.5	2.37		2.37		2.37	
Danaher	67.3	8.39		5.99		6.38	
Northern Cooperage Co.	67.3	2.00		2.00		2.00	
Danber	75.4	Not in		2.89		2.97	
		15.40	0.43	19.49	0.43	22.83	0.43
Fiborn Quarry	33.7	4.06		4.01		4.01	
		19.46	0.43	23.50	0.43	26.84	0.43
Marquette Stone Quarry	155	0.27		0.27		0.27	
Lake Street	155	1.12		1.12		1.12	

Republic Branch— Humboldt to Republic	0.00 to 8.70	8.70		8.70		8.70																	
Total		72.93		72.93		72.93		5.08		5.08		5.08											
Nestoria to Houghton	0.00 to 48.24	48.24		48.24		48.24																	
Total—Marquette to Houghton		121.17		121.17		121.17		5.08		5.08		5.08											
Nestoria to State Line	200.90 to 302.37	101.47		101.47		101.47																	
No. Bessemer to Bessemer	0.00 to 2.23	2.23		2.23		2.23																	
		103.70		103.70		103.70																	
		420.18	0.83	420.18	0.83	420.18	0.83	5.08	0.74	5.08	0.74	5.08	0.74										

Consolidated Fuel & Lumber Co.	155	0.29		0.29		0.29																	
Dead River	156.3	2.98		2.78		2.78																	
Eagle Mills "Y"	162.6	0.02		0.02		0.02																	
Negaunee Mine	166.8		0.21		0.27		0.27																
Negaunee & Palmer	166.8	4.19		4.19		4.19																	
Milwaukee Mine	166.8	1.74		1.74		1.74																	
Mary Charlotte Old Mine	166.8	1.39		1.39		1.39																	
Teal Lake	166.8	1.39		1.39		1.39																	
Lake Superior Pit No. 7	169.8		0.34		0.34		0.3																
Lake Shaft	169.8		0.32		0.32		0.3																
Winthrop	171.4	1.94		1.94		1.94																	
American Mine	179.0	2.00		2.00		2.00																	
Champion	185.7	0.98		0.98		0.98																	
Imperial Mine	194.3	1.03		0.91		0.91																	
Webster Mine	194.3	0.89		0.89		0.89																	
Beaufort	196.0		0.72		0.72		0.4																
		20.83	1.59	20.51	1.65	20.51	1.3																
Mdse Dock L'Anse	16.8	0.75		0.75		0.75																	
Baraga Mill	22.1	0.46		0.46		0.46																	
Arnheim Quarry	32.4	0.79		0.69		0.69																	
		2.00		1.90		1.90																	
		22.83	1.59	22.41	1.65	22.41	1.3																
Paquette Mill	215.5	0.43		0.43		0.43																	
Trout Creek Mfg. Co.	239.1	0.56		0.33		0.33																	
Weidman	239.1	Not in		7.47		7.47																	
Basco	244.5	Not in		1.35		1.35																	
Baltimore	252.5	5.85		5.85		5.85																	
Jensen Mill	255.3	Not in		Not in		1.00																	
Ewen Saw Mill	255.3	0.92		1.00		Take n u																	
Bergland	269.7	2.80		2.80		2.80																	
		10.56		19.23		19.23																	
		52.85	2.02	65.14	2.08	68.48	1.																

RECAPITULATION

MILEAGE

	Riggs—1911		Hansel—1912		Riggs—1913	
	Miles	Total Miles				
FIRST MAIN TRACK	420.18		420.18		420.18	
JOINT FIRST MAIN TRACK	0.83		0.83		0.83	
		421.01		421.01		421.01
SECOND MAIN TRACK	5.08		5.08		5.08	
JOINT SECOND MAIN TRACK	0.74		0.74		0.74	
		5.82		5.82		5.82
BRANCHES	52.85		65.14		68.48	
JOINT BRANCHES	2.02	54.87	2.08	67.22	1.80	70.28
TOTAL (Not Including Side Tracks)		481.70		494.05		497.11

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 1	1911		1912	
		C. R.	P. V.	C. R.	P. V.
		$	$	$	$
REAL ESTATE USED IN RAILWAY OPERATION	RIGHT OF WAY USED IN RAILWAY OPERATION—				
CHIPPEWA COUNTY:	Appendix, page 256.				
Sault Ste. Marie Union Depot Co.	The Sainte Marie Union Depot Co.				
1.* Tract of landing fronting on Portage Avenue, Sault Ste. Marie, extending from Magazine St. to Meridian St., 2,000 lin. ft. front; depth varying from 180 ft. to 225 ft., valued for railway purposes, @ $30.00 per ft. 63,000 303 ft. frontage on Ridge St. @ $10.00 per ft. 3,030 Total valuation 66,030 On-half interest, owned by D., S. S. & A.	Tract of land fronting on Portage Ave., Sault Ste. Marie, extending from Magazine St. to near Meridian St., 1,850 lin. ft. front—depth varying from 110 to 250 ft. 1,850 lin. ft. @ $30.00 per ft. $55,500 Frontage on Ridge St., 110 ft. @ $10.00 per ft. 1,100 56,600 Note:—1912 appraisal does not include this in D., S. S & A. summary.	33,015	33,015		
Joint terminals owned by the D., S. S. & A. and the Minneapolis, St. Paul & Sault Ste. Marie R'y at Sault Ste. Marie. The properties of the two companies are separately listed. They adjoin each other and some years ago a ninety-nine year lease was given by each company for an undivided on-half interest in its holdings. The D., S. S. & A. lands carry the Riparian Rights.	Joint terminals owned by D., S. S. & A. R'y and the Minneapolis, St. Paul and Sault Ste. Marie R'y at Sault Ste. Marie. D., S. S. & A., one-half interest.				
(a)* Lands in name of D., S. S. & A.	(a) Lands in name of D., S. S. & A. R'y.				
	1. Tract of land from Michigan-Lake Superior Power Canal to 6th St., an average of 1,175 ft. long by 235 ft. wide. 6.3 acres @ $2,000 $12,600				
2. From Michigan-Lake Superior Power Canal, 6th St., average 1,175 ft. long by 235 ft. wide, 6⅓ acres, average $2,500 per acre 15,833	2.* Tract of land fronting on the harbor, containing the joint yard. No railroad use of Riparian rights. No Railroad use of any of the land north of the highway, except small traingle at corner South and Sixth Streets, containing 0.7 acres. Railroad use of that part of the land south of the highway occupied by the Joint Yard, containing 18.5 acres. Total in railroad use—19.2 acres @ $1,000 per acre 19,200				

3. Tract of land fronting on the harbor occupied by yard. Total width varies from 500 to 900 ft. Made land extending into the lake, on which is laid a track 3,000 ft. long. Total length 2,800 ft. Total acreage 46½. Valued on basis of $60.00 per ft. of length — 168,000

4. Tract of land extending west from line of American Brick Co., 1,440 ft. x 530 ft.
17.52 acres @ $700 per acre — 12,264

5. Tract of land extending 1,950 ft. by 225 ft. wide to end of joint yard.
10.07 acres @ $500 per acre — 5,035
See No. 11 below.

See No. 12 below.

Total, D., S. S. & A., 80.42 acres $201,132
One-half interest.

(b) Lands in name of M., St. P. & S. S. M.

6. Triangle.
10.555 acres @ $500 per acre — 5,278

7. Tract, 1,320 x 887 ft. (av.) less highway.
24.84 acres @ $600 per acre — 14,904

8. Tract average 360 ft. by 2,080 ft.
17.19 acres @ $1,000 per acre — 17,190

9. Triangle bounded by 6th Ave., South Shore Add. and D., S. S., & A. land
8.094 acres @ $1500 per acre — 12,141

* Modified.
† Real estate not included in 1913 appraisal.

3.* Track of land extending west from line of the American Brick Co., 1,440 ft. long by 530 ft. wide. Railroad use of that part of the land occupied by the Joint Yard and "Y."
7 acres @ $700 per acre — 4,900

4. Tract of land—1,950'x225' extending to end of Joint Yard.
9.7 acres @ $800 per acre — 7,760

5. Tract of land between Portage St. and Michigan L. S. Power Canal. Central part in railroad use.
3.1 acres @ $2,500 per acre — 7,750

6. Triangle, 75 feet front on Portage St. Non-railroad use — 0

Total, D., S. S. & A. R'y — 52,210
One-half interest — 100,566 — 100,566 — 26,105 — 26,105

(b) Lands in name of M., St. P. & S. S. M. R'y.

7. Triangular tract of land west of section line 11-12 and north of Fourth Avenue. Non-railroad use except one small corner near the "Y."
0.2 acres @ $700 per acre — 140

8. Tract of land—1,320'x887', average, less highway. Non-railroad use except that part containing the "Y."
3.4 acres @ $1,000 per acre — 3,400

9. Tract of land—2,080'x360'. Non-railroad use except small traingle.
0.2 acres @ $1,000 per acre — 200

10. Triangle bounded by 6th Avenue, South Shore Addition and D., S. S. & A. R'y lands. Northerly part in railroad use.
3.3 acres @ $1,000 per acre — 3,300

11. Tract of land between South St. and Mich.-L. S. Power Canal, and tract at corner Spruce and Meridian Sts. north of Power Canal. Railroad

* Modified.

Riggs—1911—Exhibit 1		Hansel—1912—Exhibit 15		1911		1912	
				C. R.	P. V.	C. R.	P. V.
				$	$	$	$
10. Tract between South St. and M. L. S. Power Canal. 16.356 acres @ $2,000 per acre	32,712	use of westerly part 6.8 acres @ $2,000 per acre	13,600				
11.* Tract between Portage St. and M. L. S. Power Canal. 7.274 acres @ $2,500 per acre	18,185	See No. 5 above. See No. 6 above.					
12.* Triangle, 75 ft. front on Portage St. @ $20	1,500						
Total, M., St. P. & S. S. M., 84.31 acres	$101,910	Total M., St. P. & S. S. M. R'y	20,640				
One-half interest to D., S. S. & A.		One-half interest.		50,955	50,955	10,320	10,320
13. Right of way and station grounds all treated as country land.		12. Station grounds at Trout Lake 2.0 acres @ $200 per acre	400				
(a)* 170.4 acres clay loam land @ $50.00 per acre	8,520	13. Station grounds at Brimley 2.0 acres @ $200 per acre	400				
(b) 109.14 acres clay loam land @ $37.50 per acre	4,093	14. Station grounds at Eckerman 2.0 acres @ $200 per acre	400				
(c) 202.15 acres sandy loam land @ $37.50 per acre	7,581						
(d) 254.1 acres sandy loam land @ $25.00 per acre	6,352	15. Rural right of way 711.9 acres @ $25 per acre	17,798				
735.79 acres	26,546	717.9 acres	18,998	26,546	26,546	18,998	18,998
Total in Chippewa County				211,082	211,082	55,423	55,423
MACKINAC COUNTY:							
St. Ignace—Total acreage 97½ acres.							
1.* Humphrey lot, 136 ft. x 1,650 ft.—Riparian rights on 136 ft. 5.151 acres @ $200 per acre	$1,030	Omitted		1,030	1,030		
2.* Right of way, dock property to Mariel furnace. 6,450 ft.—97.8 acres @ average of $350 per acre	3,423	Omitted		3,423	3,423		
3.* Dock property—2,400 ft. harbor frontage, including land occupied by all docks, valued @ $10 per ft.	24,000	16. Dock property at St. Ignace—2,400 ft. harbor frontage, including land occupied by all docks and Riparian rights @ $15.00 per ft.	$36,000	24,000	24,000	36,000	36,000

4.* Right of way in town, varying widths in residence and business district. 4,200 lin. ft. valued @ $5.00 per ft. of line	21,000	17. Right of way, St. Ignace, east side of High St. to 240' west of West side of Marquette St.—5,300 lin. ft. @ $5.00 per ft.	26,500	21,000	21,000	26,500	26,500
5. Right of way and gravel pit lands from M. P. 1 plus 500 ft. to M. P. 2. 54.449 acres @ $100 per acre	5,445	18. Right of way and gravel pit lands from 240' west of west side of Marquette St. to Point Switch Gravel Pit tracks—1,470' west of claim 19—50.7 acres @ $100 per acre	5,070	5,445	5,445	5,070	5,070
6. (a) 245.23 acres farm land, clay loam @ $37.50 per acre $9,196							
(b) 18.27 acres farm land, sandy loam, @ $25.00 per acre 457							
Rural right of way	9,653	19. Rural right of way—289.9 acres, west of Gravel Pit Switch—289.9 acres @ $18.00 per acre	5,218	9,653	9,653	5,218	5,218
* Modified.							
Total in Mackinac County				64,551	64,551	72,788	72,788
LUCE COUNTY:							
1.* Station grounds and right of way in Newberry Village. 6.25 acres @ $750 per acre	4,688	20. Station grounds at Newberry—3 acres @ $400 per acre	1,200	4,688	4,688	1,200	1,200
2. Station grounds and right of way in Dollarville. 6 acres @ $300 per acre.	1,800	21. Station grounds at Dollarville—1 acre @ $100 per acre	100	1,800	1,800	100	100
3. Station grounds and right of way in McMillan. 12 acres @ $300 per acre	3,600	22. Station grounds at McMillan—2 acres @ $200 per acre	400	3,600	3,600	400	400
4.* Right of way, Asylum, Branch, Newberry. 4 acres @ $100 per acre	400	23. Right of way, Asylum Branch—4 acres @ $100 per acre	400	400	400	400	400
5. (a) 185.37 acres good muck farm land (celery lands) @ $40 per acre $7,415							
(b) 209 acres clay loam @ $30 acerage per acre 6,270							
394.37 acres rural right of way	13,685						
		24. Rural right of way—375.5 acres @ $22 per acre	8,261	13,685	13,685	8,261	8,261
Total in Luce County				24,173	24,173	10,361	10,361
SCHOOLCRAFT COUNTY:							
1. 7.2 acres right of way and station grounds in Seney @ $200 per acre	1,440	25. Station grounds at Seney—3 acres @ $200 per acre	600	1,440	1,440	600	600

Riggs—1911—Exhibit 1	$	Hansel—1912—Exhibit 15		1911 C. R. $	1911 P. V. $	1912 C. R. $	1912 P. V. $
2. County land, entire county undrained muck, title to 223.58 acres—290 acres occupied and cleared since 1884—282.8 acres @ $25 per acre	7,070	26. Rural right of way—286.9 acres @ $15 per acre	4,304	7,070	7,070	4,304	4,304
Total in Schoolcraft County				8,510	8,510	4,904	4,904
ALGER COUNTY:							
1. Station grounds at Wetmore—12.0 acres @ $100 per acre	1,200	27. Station grounds at Wetmore—2 acres @ $200 per acre	400	1,200	1,200	400	400
2. (a) 243 acres clay loam, fair farm land @ $37.50 per acre $9,113 (b) 341 acres sandy loam @ $25.00 per acre 8,525							
584 acres rural right of way	17,638	28. Rural right of way—473.2 acres @ $20 per acre	9,464	17,638	17,638	9,464	9,464
Total in Alger County				18,838	18,838	9,864	9,864
MARQUETTE COUNTY:							
1. Country land—County Line to M. P. 150 130.2 acres @ average of $30 per acre (See also Nos. 41, 42, 44, 46 and 48 below.)	3,906	29. Rural right of way, east of Marquette City limits and west of Ishpeming City limits—502.0 acres @ $20 per acre	10,040	3,906	3,906	10,040	10,040
2. M. P. 150 to M. P. 152—15.5 acres @ average of $50 per acre	775	Included in No. 29 above		775	775		
3. M. P. 152 to point where track enters Lake St. 14.7 acres @ average of $200 per acre	2,940	30. Right of way from Southern city limits to point where track enters Lake St.—15.0 acres @ $200 per acre	3,000	2,940	2,940	3,000	3,000
4.* Water front—Burt and Elys Add. 1,100 ft. @ $35	38,500	31. City of Marquette, east side of Lake St., Burt & Ely's Addition. No railroad use of Riparian rights.—1,100 ft. @ $1.00 per ft.	1,100	38,500	38,500	1,100	1,100
		33.* Water front inside Marquette Harbor, 2,200 ft., including the site of the Ore, Coal and Merchandise Docks. Railroad use as follows:					

THIS PAGE B

5. Water front—inside Marquette Harbor. This property covers the major part of the available frontage on the harbor of Marquette, and includes the sites of all ore, coal and merchandise docks owned by the company in the lower harbor. 2,200 ft. @ $75	165,000				
6.* Water front—outside harbor. 850 ft. @ $30 per ft.	25,500				
7. Frontage, West side of Lake St., north line of Ely Lot to Jackson St.—1,000 ft. @ $60 per ft.	60,000				
8. Frontage—west side of Lake St., north line of Ely lot to Baraga Ave.—1,110 ft. @ $30 per ft.	33,300				
9. Frontage—west side of Lake St., Jackson to Mesnard—565 ft. @ $20 per ft.	11,300				
10. Frontage—west side of Lake St., south of Hampton 170 ft. @ $20 per ft.	3,400				
11. 46—50 ft. lots between Mesnard and Hampton Sts. @ $100 per lot	4,600				
12. 12—50 ft. lots west of Division, at Hampton @ $200 per lot	2,400				
13. 12½—50 ft. lots, Jackson to Mesnard @ $400 per lot	5,000				
14. 336' frontage on Lake St., Baraga Ave. to Washinton St. @ $50 per ft.	16,800				
15. 343 ft. frontage on Front St., Baraga Ave. to Washton St. This covers end of Depot yard, two under crossings and one over crossing. It is in the most valuable part of the principal business street of Marquette. 343 ft. @ $450 per ft.	154,350				
16. 184 ft. frontage on Front St., south of Baraga Ave. @ $200 per ft.	36,800				
* Modified.					
Riparian rights northerly 1,200 ft. @ $50 per ft. $60,000 Land for approaches to Ore Docks Nos. 4 and 5—100 ft. @ $25 per ft. 2,500					
Total Balance of 1,000 ft. non railroad use.	62,500	165,000	165,000	62,500	62,500
32. East side of Lake St., south of the south line of Ely lot—850 ft. No railroad use of the Riparian rights nor of the northerly 250 ft. of this land. Railroad use—600 ft. @ $200 per ft.	1,200	25,500	25,500	1,200	1,200
34. Frontage, west side of Lake St., north line Ely lot to Jackson St.—1,000 ft. @ $30 per ft.	30,000	60,000	60,000	30,000	30,000
34. (a) Frontage, west side Lake St., north line Ely lot to Baraga Ave.—1,110 ft. @ $15 per ft.	16,650	33,300	33,300	16,650	16,650
35. Frontage, west side of Lake St., Jackson St. to Mesnard St.—565 ft. @ $10 per ft.	5,650	11,300	11,300	5,650	5,650
36. Frontage, west side of Lake St., south of Hampton St.—170 ft. @ $15 per ft.	2,550	3,400	3,400	2,550	2,550
37. 46—50 ft. lots between Mesnard and Hampton Sts. @ $100 per lot	4,600	4,600	4,600	4,600	4,600
38. 12—50 ft. lots west of Division St., at Hampton St. @ $200 per lot	2,400	2,400	2,400	2,400	2,400
39. 12½—66 ft. lots, Jackson St. to Mesnard St., @ $300 per lot	3,750	5,000	5,000	3,750	3,750
40. 336 ft. frontage on Lake St., Baraga Ave. to Washington St., non-railroad use of 40 ft. thoroughfare and of 100 ft. total width—both sides of approach to No. 5 Ore Dock—total 140 ft.—336 ft.—140 ft. 196 ft. in railroad use @ $40 per ft.	7,840	16,800	16,800	7,840	7,840
41. 343 ft. frontage on Front St., Baraga Ave. to Washington St. Depot grounds—2 under and 1 over crossing. Non railroad use of 40 ft. thoroughfare, leaving 303 ft. @ $400 per ft.	121,200	154,350	154,350	121,200	121,200
42. 184 ft. frontage on Front St., south of Baraga Ave. @ $200 per ft.	36,800	36,800	36,800	36,800	36,800
* Modified.					

Riggs—1911—Exhibit 1		Hansel—1912—Exhibit 1		1911		1912	
				C. R.	P. V.	C. R.	P. V.
	$			$	$	$	$
17. 445 ft. frontage on Main St., front to 3rd @ $60 per ft.	26,700	43. 445 ft. frontage on Main St., Front St. to 3rd St. @ $60 per ft.	26,700	26,700	26,700	26,700	26,700
18. 14,608 sq. ft. on Front St., 3rd St. to Washington and Main @ $2.00 per ft.	29,216	44. 14,000 sq. ft. in alley east of 3rd St., Washington St. to Main St. @ $1.50 per sq. ft.	21,000	29,216	29,216	21,000	21,000
19. 100 ft. frontage on Baraga Ave. @ $50 per ft.	5,000	45. Equivalent 100 ft. frontage on Baraga Ave. @ $50.00 per ft.	5,000	5,000	5,000	5,000	5,000
20.* 150 ft. frontage on Spring St. @ $50.00 per ft.	7,500	46. Equivalent 150 ft. frontage on Spring St. @ $50.00 per ft.	7,500	7,500	7,500	7,500	7,500
21. 21 lots, 3rd St. to 5th St., @ $500 per lot	10,500	47. Third St. to Fifth St.—3.5 acres @ $3,000 per acre	10,500	10,500	10,500	10,500	10,500
22. 60 lots in shop grounds, 5th St. to Park St., @ $500 per lot	30,000	48. Fifth St. to Park St.—Shop grounds—15.1 acres @$2,000 per acre	30,200	30,000	30,000	30,200	30,200
23. Unplatted lands south of Nester's Add. and west of Shops—34 acres.—Estimate based on 6 lots per acre @ $150 per lot—$900 per acre	$30,600						
24. South of Nester's Addition and west of the last above tract—36 acres @ $1,000 per acre	36,000						
	66,600	49.* Tract of land south of Nestor's Addition, west of shops. Railroad use of 18.2 acres, including Quarry Spur—@$1,200 per acre	21,840	66,600	66,600	21,840	21,840
25. Industrial sites at end of Dead River Railroad in North Marquette, between L. S. & I. ore docks and iron works—151.35 acres @ $200 per acre	30,270	50. North Marquette, industrial sites, 151 acres. Railroad use:—a 100 ft. strip for 2,250 ft. track—5.1 acres @ $200 per acre	1,020	30,270	30,270	1,020	1,020
* Modified.		* Modified.					
26. Dead River Railroad—right of way—30 acres outside of platted part of city @ $200 per acre	6,000	51. Dead River Branch—right of way—28.2 acres @ $200 per acre	5,640	6,000	6,000	5,640	5,640
27. Right of way—north line, to city limits—6.8 acres @ $200 per acre	1,360	52. North line—right of way to city limits Marquette—6.8 acres @ $200 per acre	1,360	1,360	1,360	1,360	1,360
		54.* South line—right of way, south of Division St. to north line of the S.W.¼ of S.W.¼ of section 26—4.1 acres in railroad use @ $200 per acre	820				
		55. South line—right of way from north line of S. W. ¼ of S. W. ¼ of section 26 to mile post 9—96.4 acres @ $75 per acre	7,230				
28. Right of way—south line—Hampton St. to M. P. 1							

THIS PAGE BO

16 acres @ $200	3,200				
(See also No. 30 below).		8,050	3,200	3,200	8,050	8,050
29. Right of way—north line, city limits Marquette to limits Negaunee—79 acres @ $150	11,850	53. North line—right of way city limits Marquette to mile post 163—90.3 acres @ $100 per acre	9,030	11,850	11,850	9,030	9,030
30. Right of way—south line, limits Marquette to limits Negaunee—96 acres @ $100 per acre	9,600	Included in No. 55 above.		9,600	9,600		
City of Negaunee:		56. North line, mile post 163 to mile post 164 plus 4,200 ft. New double track line 2.6 miles near Negaunee mine.					
31. North line—M. P. 163 to M. P. 164 plus 2,800 ft. New line—2.6 miles near Negaunee mine. South line—M. P. 9 to M. P. 12. Total acreage—86 acres @ $2,500 per acre	215,000	South line, mile post 9 to mile post 12. 46.5 acres @ $1,000 per acre } 40.0 acres @ $3,000 per acre }	166,500	215,000	215,000	166,500	166,500
32. In Negaunee City to M. P. 167 on main line. Total acreage—29 acres @ $3,500 per acre	101,500	57. North and south lines in city of Negaunee, to mile post 167; in railroad use—18.9 acres @ $4,000 per acre	75,600	101,500	101,500	75,600	75,600
		58. North line, mile post 167 to point 8,700 ft. west, within city limits of Negaunee and Ishpeming. Right of way for single track considered equivalent to width of 50 ft. 4.6 acres @ $4,000 per acre } 5.4 acres @ $3,000 per acre }	34,600	43,500	43,500	34,600	34,600
33.* Track rights in Negaunee:		59. Teal Lake Branch, Negaunee—7,300 ft. @ $1.50 per ft.	10,950	10,950	10,950	10,950	10,950
(a) Main line—8,700 ft. @ $5 per ft.	43,500	62. South line, from center of Section 11 to west line Ishpeming City limits. 30.0 acres @ $3,000 per acre } 8.3 acres @ $1,000 per acre }	98,300	17,500	17,500	98,300	98,300
(b) Branch—7,300 ft. @ $1.50 per ft.	10,950						
Between Negaunee and Ishpeming.		61. South line in Negaunee and Ishpeming, mile post 167 west to center line of section 11—12.4 acres @ $3,000 per acre	37,200	95,500	95,500	37,200	37,200
34.* South line—17½ acres @ $1,000 per acre	17,500						
City of Ishpeming		63. North line in Ishpeming, from center of section 2 to north line of section 10—9.6 acres @ $3,000 per acre $28,800					
35. South line—in city—38.2 acres @ $2,500 per acre.	95,500	65. North line in Ishpeming, from center line of section 9 to connection with south line, 7.0 acres @ $3,000 per acre 21,000					
36.* North line:							
(a) Eastern part of city—9.0 acres @ $3,000 per acre	27,000						
(b) Western part of city—7.0 acres @ $3,500 per acre	24,500						

Riggs—1911—Exhibit 1		Hansel—1912—Exhibit 15		1911		1912	
				C. R.	P. V.	C. R.	P. V.
				$	$	$	$
		66. Right of way—title by prescription, for track connecting north line with main line, from north line section 16 to right of way of main line, 750 ft. assumed 66 ft. wide—1.1 acres @ $3,000 per acre 3,300					
Total	51,500	Total	53,100	51,500	51,500	53,100	53,100
		64. North line, in Ishpeming, from north line of section 10 to center line of section 9—5,000 ft. through the central part of the city—narrow right of way, trackage rights and extra lots: 3,000 ft. @ $30 per lin. ft. 2,000 ft. @ $5 per lin. ft.	100,000	150,000	150,000	100,000	100,000
37.* Through central part of city—narrow right of way, Track rights and extra lots. 5,000 lin. ft. of track, est. @ $30 per track ft.	150,000						
Omitted		60. Track rights from Palmer Branch to Milwaukee Mine—9,200 ft. @ $1.50 per ft.	13,800			13,800	13,800
38.* Winthrop Branch—23 acres @ average $300 per acre	6,900	67.* Winthrop Branch, trackage rights	6,900	6,900	6,900	6,900	6,900
39.* Mary Charlotte Branch—3.2 acres @ $100 per acre	320	68.* Mary Charlotte Branch—3 acres @ $100 per acre	300	320	320	300	300
40.* Palmer Branch—31.4 acres @ of $100 per acre.	3,140	69.* Palmer Branch—31.3 acres @ $100 per acre	3,130	3,140	3,140	3,130	3,130
41. Ishpeming limits to M. P. 173-16.8 acres @ $250 per acre	4,200	Included in No. 29 above.		4,200	4,200		
42. M. P. 173 to East End Humboldt Yard—100.8 acres @ 75 per acre	7,560	Included in No. 29 above.		7,560	7,560		
43. Humboldt—18 acres @ $500 per acre	9,000	70. Humboldt, station grounds—4 acres @ $100 per acre	400	9,000	9,000	400	400
44.* Humboldt to Champion—36 acres @ $40 per acre	1,440	Included in No. 29 above.		1,440	1,440		
		71. Champion Mine Branch 7.5 acres @ $200 per acre 1,500					
		72. Champion station grounds 3 acres @ $200 per acre 600					

45. Champion (including branch—350 acres @ $350 per acre	6,300		2,100	6,300	6,300	2,100	2,100
46.* Champion to Michigamme and Michigamme to County line—84 acres @ $25 per acre	2,100	Included in No. 29 above.		2,100	2,100		
47. Michigamme—8 acres @ $350 per acre	2,800	73. Michigamme station grounds—2 acres @ $200 per acre	400	2,800	2,800	400	400
48. Republic Branch:		74. (See No. 29 above)		2,350	2,350		
Country land—94 acres @ $25 per acre	2,350	Republic—8. 1 acres @ $1,000 per acre	8,100	8,000	8,000	8,100	8,100
In Republic Village—8 acres @ $1,000 per acre	8,000						
Total Marquette County				1,541,927	1,541,927	1,068,500	1,068,500
BARAGA COUNTY:							
1. Three Lakes station grounds—20 acres @ $75 per acre	1,500	75. Three Lakes station grounds—6 acres @ $100 per acre	600	1,500	1,500	600	600
2. Nestoria station grounds—15 acres @ $200 per acre	3,000	76. Nestoria station grounds—10 acres @ $100 per acre	1,000	3,000	3,000	1,000	1,000
3. Baraga station grounds—13.2 acres @ $1,000 per acre	13,200	78. Baraga station grounds—6 acres @ $1,000 per acre	6,000	13,200	13,200	6,000	6,000
		79. Keweenaw Bay station grounds—6 acres @ $200 per acre	1,200	6,000	6,000	1,200	1,200
4. Keweenaw Bay station—6 acres @ $1,000 per acre	6,000						
5.* Assinins station grounds—6 acres @ $1,000 per acre	6,000	80. Assinins station grounds—6 acres @ $200 per acre	1,200	6,000	6,000	1,200	1,200
		77. L'Anse terminal railroad use of 3 acres in village @ $1,500 per acre 4,500 15.5 acres south of village @ $100 per acre 1,550					
6.* L'Anse Terminal—45.2 acres @ $1,500 per acre	67,800		6,050	67,800	67,800	6,050	6,050
7. Country Land:							
300 acres—sandy and rocky @ $25 per acre 7,500							
85 acres—fair sandy loam @ $37.50 per acre 3,187							
327 acres—clay loam @ $45 per acre 14,715							
136 acres—good farm land @ $60 per acre 8,160							
848 acres—Total rural right of way	33,562	81. Rural right of way—723.4 acres @ $30 per acre	21,702	33,562	33,562	21,702	21,702
Total Baraga County				131,062	131,062	37,752	37,752

* Modified.

* Modified.

Riggs—1911—Exhibit 1		Hansel—1912—Exhibit 15		1911		1912	
				C. R.	P. V.	C. R.	P. V.
				$	$	$	$
HOUGHTON COUNTY:							
1. Houghton terminal—12 acres—1,550 ft. of water front with Riparian rights, depth ranging from 150 ft. to 350 ft.—1,500 ft. @ $35 per foot	52,500	82. Houghton terminal —1,550 ft. water front, non railroad use of Riparian rights—1,500 ft. @ $20 per foot	30,000	52,500	52,500	30,000	30,000
2. First mile out of Houghton yard along shore of Portage Lake at foot of bluff below State School of Mines and residence district—12.8 acres @ $2,500 per acre	32,000	83. First mile south of Houghton terminal—12.8 acres @ $2,000 per acre	25,600	32,000	32,000	25,600	25,600
3. School of Mines to Chassell—63 acres @ $200 per acre	$12,600	(Included in No. 87 below).					
4. Chassell station grounds—10 acres @ $1,000 per acre	10,000	84. Chassell station grounds—6 acres @ $750 per acre	4,500	10,000	10,000	4,500	4,500
5.* Kenton station grounds—8 acres @ $1,000 per acre	8,000	86. Kenton station grounds—6 acres @ $400 per acre	2,400	8,000	8,000	2,400	2,400
6. Sidnaw station grounds—8 acres @ $1,200 per acre	9,600	85. Sidnaw station grounds—6 acres @ $400 per acre	2,400	9,600	9,600	2,400	2,400
7. Country land, Baraga Co. line to Sidnaw, 6 acres @ $200 per acre	1,200						
8. Other country land—good clay loam or muck lands—154 acres @ $50 per acre	7,700						
Total country lands—223 acres	21,500	87. Rural right of way—318.6 acres @ $40 per acre	12,744	21,500	21,500	12,744	12,744
Total Houghton County				133,600	133,600	77,644	77,644
ONTONAGON COUNTY:							
1. Station grounds—Ewen, Lake Gogebic and Trout Creek— 20 acres @ $1,000 per acre	20,000	88. Ewen station grounds—6 acres @ $400 per acre	24,000				
2. Station grounds—small villages 10 acres @ $ 200 per acre	2,000	89. Bergland, Bruce, Lake Gogebic, Faynesville and Trout Creek station grounds—15 ac. @ $200 per ac.	3,000				
Total station grounds 30 acres	22,000	Total station grounds—21 acres	5,400	22,000	22,000	5,400	5,400

3. Country land							
460 acres clay loam land @ $50 per acre	23,000						
Extra width of 100 ft.—14.8 miles							
177.6 acres clay loam land @ $50 per acre	8,880						
Total							
637.6 acres country land	31,880	90. Rural right of way—468.6 acres @ $26 per acre	12,184	31,880	31,880	12,184	12,184
Total Ontonagon County				53,880	53,880	17,584	17,584
GOGEBIC COUNTY:							
1. Thomaston station grounds—60 acres estimated @ $200 per acre	12,000	91. Thomaston station grounds—25 acres @ $100 per acre	2,500	12,000	12,000	2,500	2,500
2. Country lands—446 acres @ $50 per acre	22,300	92. Rural right of way—301.4 acres @ $45 per acre	13,563	22,300	22,300	13,563	13,563
Total Gogebic County				34,300	34,300	16,063	16,063

—17—

Modifications to 1911 Appraisal as per Exhibit 50 Real Estate Used in Railroad Operation			Deductions	Additions
			$	$
CHIPPEWA COUNTY:				
1. Sault Ste. Marie Depot Lands:				
		D., S. S. & A.—		
Total valuation	$ 66,000	½ interest	$33,000	
Deduct in affidavit of		D., S., S. & A.—		
April 26th	21,500	½ interest	10,750	10,750
		D., S. S. & A.—		
	$44,500	½ interest	22,250	
(b) Lands in name of M., St. P. & S. S. M.				
11. Tract between Portage St. and M.L-. S. Power Canal				
12. Triangle on Portage St.				
Should appear as being in name of D., S. S. & A. (Joint terminals)				

Modifications to 1912 Appraisal	Deductions	Additions
	$	$
CHIPPEWA COUNTY:		
Sault Ste. Marie.		
Items 2 and 3.		
50 foot right of way to Kelley Mayer Co., American Brick Co. and Bradley Watkins Co.—2.8 acres @ $1,500=$4,200—½ interest		2,100
Overhead expenses—15%		315
Total addition		2,415
1912 valuation Chippewa County		55,423
Modified valuation—Chippewa County		57,838

Modifications to 1911 Appraisal as per Exhibit 50 Real Estate Used in Railroad Operation			Deductions	Additions	Modifications to 1912 Appraisal	Deductions	Additions
			$	$		$	$
13. (a) Right of way and station grounds:							
Direct Exam.	170.40 acres clay loam land @ $50	8,520					
Should be Brimley	2.58 acres @ $600	1,548					
	167.82 acres clay loam land @ $50	8,391					
	170.40	9,939		1,419			
Totals			10,750	1,419			
Net deduction, Chippewa Co.			9,331				
1911 valuation Chippewa County			211,082				
Modified Valuation Chippewa County			201,751				
MACKINAC COUNTY:					MACKINAC COUNTY:		
1. Cross Exam. Deduct Humphrey lot			1,030		No changes.		
2. Cross Exam. Deduct right of way to Martel Furnace			3,423				
3. and 4. Direct Exam. Increase St. Ignace property 50%				22,500			
Totals			4,453	22,500			
Net additions in Mackinac County				18,047			
1911 valuation Mackinac County				64,551			
Modified valuation—Mackinac County				82,598			
LUCE COUNTY:					LUCE COUNTY:		
1. Direct Exam. Increase New berry village from $750 per acre to $1,500				4,688	No changes.		

4.	Direct Exam. Increase Asylum Branch from $100 per acre to $300		800				
	Total		5,488				
	1911 valuation—Luce County		24,173				
	Modified valuation—Luce County		29,661				
	SCHOOLCRAFT COUNTY:			SCHOOLCRAFT COUNTY:			
	No changes.			No changes.			
	ALGER COUNTY:			ALGER COUNTY:			
	No changes.			No changes.			
	MARQUETTE COUNTY:			MARQUETTE COUNTY:			
4.	Cross Exam.—Decrease Burt & Ely's Addition frontage from $35 to $30 per lin. ft., 1,100 ft.	5,500		49.	Consolidated Fuel & Lumber Co. grounds—5 acres @ $1,500		7,500
6.	Cross Exam.—Increase Water Front outside of Harbor from $30 to $35 per ft.—850 ft.		4,250	54.	1,160 ft. of right of way 100 ft. wide—2.7 acres @ $250		675
20.	Direct Exam.—Increase Spring St. frontage from $50 to $66⅔ per ft.—150 ft.		2,500	33.	This item should be descriped as follows:—Water front inside Marquette Harbor—2,200 ft., including site of the ore, coal and merchandise docks. Railroad use as follows:		
	Affidavit—Deduction in affidavit of April 26 for unused lands in city of Marquette	150,000			Riparian rights, northerly 700 ft. @ $50 a ft. $35,000		
33.	Direct Exam.—Add 9,120 ft. of trackage rights at Negaunee @ $1.50		13,680		Land for approaches to ore docks Nos. 4 and 5—100 ft. @ $25 a ft. 2,500		
37.	Direct Exam.—Add acreage of 1.52 acres on 1,000 ft. right of way @ $3,500—City of Ishpeming		5,320		One-half of the land, except approaches to ore docks, north of the switch leading to Pickands Coal Co.—½ of 1,300 ft. @ $25 a ft. 16,250		
34.	Direct Exam.—Change acreage of land between Ishpeming and Negaunee from 17½ to 12.34 acres—5.16 acres @ $1,000	5,160			Total for item 33 53,750		
36.	(a) Direct Exam.—City of Ishpeming, north line—change acreage from 9.0 to 9.7—0.7 acres @ $3,000		2,100		Previous total for item 33 62,500		
36.	(b) Direct Exam.—Change acreage from 7.0 to 7.6—0.6 acres @ $3,500		2,100		Difference 8,750		
39.	Direct Exam.—Mary Charlotte Branch increase from $100 per acre to $2,500—3.2 acres		7,680		Overhead expenses—15% 1,313		
38.	Direct Exam.—Winthrop Branch, increase from $300 per acre to $2,500—23 acres		50,600		Total deduction $10,063	10,063	
40.	Direct Exam.—Palmer Branch, increase from $100 per acre to $2,500—31.4 acres		75,360	68.	Mary Charlotte Branch—3 acres @ ($2,000—$100)		5,700
46.	Direct Exam.—Increase country land, Champion to Michigamme and Michigamme to county line from $25 per acre to $50—84 acres.		2,100	67.	Winthrop Branch—trackage rights 1.94 miles, considered equivalent to 50 ft. right of way.—11.8 acres @ $2,000 23,600		
					Previous total 6,900		16,700

Modifications to 1911 Appraisal as per Exhibit 50 Real Estate Used in Railroad Operation	Deductions	Additions
	$	$
44. Direct Exam.—Increase country land, Humboldt to Champion from $40 an acre to $50—36 acres		360
Total	160,630	166,050
Net additions		5,390
1911 valuation—Marquette County		1,541,927
Nodified valuation—Marquette County		1,547,317
BARAGA COUNTY:		
5. Direct Exam.—Decrease value at Assinins from $1,000 per care to $200—6 acres	4,800	
6. Cross Exam.—Decrease acreage at L'Anse Terminal from 45.2 to 32.1—13.1 acres @ $1,500	19,650	
Total	24,450	
1911 valuation—Baraga County	131,062	
Deductions	24,450	
Modified valuation—Baraga County	106,612	
HOUGHTON COUNTY:		
5. Direct Exam.—Decrease value at Kenton from $1,000 per acre to $750—8 acres	2,000	
1911 valuation Houghton County	133,600	
Deductions	2,000	
Modified valuation—Houghton County	131,600	

Modifications to 1912 Appraisal	Deductions	Additions
	$	$
69. Palmer Branch—31.3 acres @ ($2,000—$100)		59,470
Total		90,045
Overhead expense—15%		13,507
Totals	10,063	103,552
Reductions		10,063
Net additions		93,489
1911 valuation Marquette County		1,068,500
Modified valuation—Marquette Co.		1,161,989
BARAGA COUNTY:		
No changes.		
HOUGHTON COUNTY:		
No changes.		

ONTONAGON COUNTY: No changes.		ONTONAGON COUNTY: No changes.	
GOGEBIC COUNTY:		GOGEBIC COUNTY: No changes.	
1. Cross Exam.—Decrease acreage at Thomaston from 60 to 20.5 acres—39.5 acres @ $200	7,900		
1911 valuation, Gogebic County	34,300		
Deductions	7,900		
Modified valuation—Gogebic County	26,400		

RECAPITULATION RIGHT OF WAY and STATION GROUNDS

COUNTY	Original 1911 Appraisal		Modified 1911 Appraisal		Original 1912 Appraisal		Modified 1912 Appraisal	
	C. R.	P. V.	C. R.	P. V.	C. R.	P. V.	C. R.	P. V.
	$	$	$	$	$	$	$	$
Chippewa County	211,082	211,082	201,751	201,751	55,423	55,423	57,838	57,838
Mackinac County	64,551	64,551	82,598	82,598	72,788	72,788	72,788	72,788
Luce County	24,173	24,173	29,661	29,661	10,361	10,361	10,361	10,361
Schoolcraft County	8,510	8,510	8,510	8,510	4,904	4,904	4,904	4,904
Alger County	18,838	18,838	18,838	18,838	9,864	9,864	9,864	9,864
Marquette County	1,541,927	1,541,927	1,547,317	1,547,317	1,068,500	1,068,500	1,161,989	1,161,989
Baraga County	131,062	131,062	106,612	106,612	37,752	37,752	37,752	37,752
Houghton County	133,600	133,600	131,600	131,600	77,644	77,644	77,644	77,644
Ontonagon County	53,880	53,880	53,880	53,880	17,584	17,584	17,584	17,584
Gogebic County	34,300	34,300	26,400	26,400	16,063	16,063	16,063	16,063
Total in Michigan	2,221,923	2,221,923	2,207,167	2,207,167	1,370,883	1,370,883	1,466,787	1,466,787

Schedule No. 2 — REAL ESTATE

Mr. Riggs in the appraisal of 1911—Exhibit No. 1—carried a schedule of real estate, other than shown in Schedule No. 1, the total of which was $12,733. Mr. Hansel did not include this property in his 1912 appraisal, exhibit No. 15 and Mr. Riggs excluded it from Exhibit No. 1-A, being the appraisal for 1913. In exhibit 50 Mr. Riggs deducted this item from the 1911 appraisal because it was not used in operation.

Schedule No. 3

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS

GRADING

Riggs—1911—Exhibit 1			Hansel-1912-Exhibit 15		Riggs—1913—Exhibit 1-A				Alloc-ation	1911			1912			1913		
EAST OF MARQUETTE:										C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
Grading:																		
EARTHWORK:										$		$	$		$	$		$
Sault Ste. Marie to Marquette 152.34 miles	1,667,301 c. y.	@ $0.30	Total E. of Marquette 395,200 c. y.	@ $0.20	1st main track	Miles 152.34				506,190	100	506,190	79,040	100	79,040			
Trestles filled since 1900 appraisal	54,717	0.30	Total E. of Marquette 1,863,100	0.26	1st main trk. jt.	0.83				16,415	100	16,415	484,405	100	484,405			
One box culvert since 1900 appraisal	9	0.30	Total E. of Marquette 154,800	0.40	2d main trk. jt.	.074				3	100	3	61,920	100	61,920			
17 Pit Cattle Guards since 1900 appraisal	459	0.30				153.91	1,768,500 c. y.	@ $0.30	F.& P.	138	100	138				530,550	100	530,550
Branches (15.40 mi.)	123,200	0.30			Branches	22.83				36,960	100	36,960						
Joint Branches (43-87 of 6960 c. y)	3,440	0.30			Branch Joint	0.43												
						23.26	186,000 c. y.	0.30	F.	1,032	100	1,032				55,800	100	55,800
St. Ignace to Soo Junction 42.97 miles	351,000	0.30			Same miles as 1911		360,097 c. y	0.30	F.& P.	105,300	100	105,300				108,029	100	108,029
4 trestles filled since 1900 appraisal	9,097	0.30								2,729	100	2,729						
Branches, 4.06 mi.	18,698	0.30			Branches	4.01	18,000 c. y.	0.30	F.	5,609	100	5,609				5,400	100	5,400
Total	2,247,921 c. y.		2,413,100 c. y.				2,332,597 c. y.			674,376		674,376	625,365		625,365	699,779		699,779
SHRINKAGE:																		
Sault Ste. Marie to Marquette	170,879	0.30					170,879	0.30	F.& P.	51,264	100	51,264				51,264	100	51,264
St. Ignace to Soo	37,500	0.30					37,500	0.30	F.& P.	11,250	100	11,250				11,250	100	11,250
Total Shrinkage	208,379 c. y.		138,000 c. y.	0.25			208,379 c. y.			62,514		62,514	34,500	100	34,500	62,514		62,514
Overhaul, Grading Crossings:																		
APPROACHES AND DEPOT GROUNDS:																		
Sault Ste. Marie to Marquette	128,159	0.30					128,159 c. y.	0.30	F.& P.	38,448	100	38,448				38,448	100	38,448

THIS PAGE

St. Ignace to Soo Junction	28,125	0.30				28,125	0.30	F.& P.	8,437	100	8,437				8,438	100	8,438
Total	156,284 c. y.		73,300 c. y.	0.25		156,284 c. y.			46,885		46,885	18,325	100	18,325	46,886		46,886
	2,247,921 c. y.		2,413,100 c. y.			2,332,597 c. y.			674,376		674,376	625,365		625,365	699,779		699,779
	208,379		138,000			208,379			62,514		62,514	34,500		34,500	62,514		62,514
	156,284		73,300			156,284			46,885		46,885	18,325		18,325	46,886		46,886
Total Earthwork	2,612,584 c. y.		2,624,400 c. y.			2,697,260 c. y.			783,775		783,775	678,190		678,190	809,179		809,179
SOLID ROCK:																	
Sault Ste. Marie to Marquette	7,162 c. y.	1.35				7,162 c. y.		F.& P.	9,669	100	9,669				9,669	100	9,669
St. Ignace to Soo Junction	8,000	1.35				8,000		F.& P.	10,800	100	10,800				10,800	100	10,800
Total Solid Rock	15,162 c. y.		24,800 c. y.	1.35		15,162 c. y.			20,469		20,469	33,480	100	33,480	20,469		20,469
LOOSE ROCK AND HARDPAN:																	
Sault Ste. Marie to Marquette	14,324	0.50				14,324 c. y.	0.50	F.& P.	7,162	100	7,162				7,162	100	7,162
St. Ignace to Soo Jct. Main line	16,000	0.50				16,000	0.50	F.& P.	8,000	100	8,000				8,000	100	8,000
Branches	717	0.50				710	0.50	F.	358	100	358				355	100	355
Total Loose Rock and Hardpan	31,041 c. y.		26,900 c. y.	0.50		31,034 c. y.			15,520		15,520	13,450	100	13,450	15,517		15,517
CORDUROY CONSTRUCTION:																	
Sault Ste. Marie to Marquette	20 Miles	564.00	20 Miles	500.00		20 Miles	564.00	F.& P.	11,280	100	11,280	10,000	100	10,000	11,280	100	11,280
CLEARING AND GRUBBING:																	
Sault Ste. Marie to Marquette Main Line	1,540.50 Acres	80.00	Main Line Clearing 1,770 Acres	40.00		1,540.50 Acres	80.00	F.& P.	123,240	100	123,240	70,800	100	70,800	123,240	100	123,240
St. Ignace to Soo Jct. Main Line	410.80 Acres	80.00	Grubbing 530 Acres	100.00		410.80 Acres	80.00	F.& P.	32,864	100	32,864	53,000	100	53,000	32,864	100	32,864
St. Ignace to Soo. Jct. Branches	25.81 Acres	80.00	Branches, Clearing 50 Acres	40.00		24.00 Acres	80.00	F.	2,065	100	2,065	2,000	100	2,000	1,920	100	1,920
Sault Ste. Marie to Marquette Branches	92.40 Acres	80.00	Grubbing 20 Acres	100.00		139.56 Acres	80.00	F.	7,392	100	7,392	2,000	100	2,000	11,165	100	11,165
Sault Ste. Marie to Marquette Joint Branches (43-87 of 5.19 Ac.)	2.56 Acres	80.00							208	100	208						
Total Clearing and Grubbing	2,072.07 Acres		2,370 Acres			2,114.86 Acres			165,769		165,769	127,800		127,800	169,189		169,18

Riggs—1911—Exhibit 1			Hansel-1912-Exhibit 15		Riggs—1913—Exhibit 1-A			Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
RIP-RAP:									$		$	$		$	$		
Omitted			Mile Post 80.9														
			20 c. y. @ $2.00		Omitted							40	100	40			
			Mile Post 153.0														
			850	2.00								1,700	100	1,700			
			Total 870 c. y.									1,740		1,740			
MARQUETTE TO HOUGHTON:					MARQUETTE TO NESTORIA:												
GRADING:																	
Main Line	95.14 Miles				1st Main Track, North Line	46.90 Miles											
South Line	17.33 Miles				1st Main Track, South Line (Marquette to Eagle Mills)	8.50 Miles											
Republic Branch	8.70 Miles				2d Main Track	5.08 Miles											
Second Main Track	5.08 Miles				Republic Branch	8.70 Miles											
Total	126.25 Miles					69.18 Miles											
Earthwork	2,155,385 c. y.	@ $0.30	254,200 c. y.	@ $0.20					646,616	100	646,616	50,840	100	50,840			
7 trestles filled since 1900	13,688	0.30	2,105,900	0.26	Earthwork	1,185,600 c. y.	@ $0.30	F.& P.	4,100	100	4,100	547,535	100	547,537	355,680	100	355,680
1 box culvert " "	5	0.30	50,000	0.40	Branches, 4.46 Mi.	52,111	0.30	F.	2	100	2	20,000	100	20,000	15,633	100	15,633
3 Cattle Guards " "	38	0.30			Main Track, South Line (Eagle Mills to Winthrop Jct.)				11	100	11						
Branches, 22.83 Miles	266,751	0.30							80,025	100	80,025						
Branches, Joint (159-371 of 53,700 c. y.)	23,014	0.30				150,750	0.30	O.	6,930	100	6,930				45,225	100	45,225
					Branches 17.42 Mi.	203,814	0.30	O.							61,144	100	61,144
					NESTORIA TO HOUGHTON:												
					Main Track 48.24 Mi.	832,650	0.30	F.& P.							249,795	100	249,795
					Branches 1.90 Mi.	22,230	0.30	F.							6,669	100	6,669
Total	2,458,881 c. y.		2,410,100 c y..			2,447,155			737,684		737,684	618,375		618,375	734,146		734,146
SHRINKAGE																	
Main Line	231,394	0.30	193,600 c. y.	@ $0.25	Marquette to Nestoria				69,418	100	69,418	48,400	100	48,400			

					Main Line	128,495 c. y.	0.30	F.& P.							38,548	100	38,548
					Main Line (South)	13,300 c. y.	0.30	O.							3,990	100	3,990
					Nestoria to Houghton Main Line	104,000	0.30	F.& P.							31,200	100	31,200
Total Shrinkage	231,394		193,600			245,795			69,418		69,418	48,400		48,400	73,738		73,738
OVERHAUL, GRADING CROSSINGS																	
Approaches and Depot Grounds	173,546	0.30	91,000	0.25	Marquette to Nestoria	95,053	0.30	F.& P.	52,064	100	52,064	22,750	100	22,750	28,516	100	28,516
					Marquette to Nestoria (South Line)	12,200	0.30	O.							3,660	100	3,660
					Nestoria to Houghton	66,282	0.30	F.& P.							19,885	100	19,885
	173,546		91,000			173,535			52,064		52,064	22,750		22,750	52,061		52,061
	2,458,881 c. y		2,410,100			2,447,155			737,684		737,684	618,375		618,375	734,146		734,146
	231,394		193,600			245,795			69,418		69,418	48,400		48,400	73,738		73,738
	173,546		91,000			173,535			52,064		52,064	22,750		22,750	52,061		52,061
Total Earthwork	2,863,821		2,694,700			2,866,485			859,166		859,166	689,525		689,525	859,945		859,945
SOLID ROCK					Marquette to Nestoria												
Main Line	39,640 c. y.	@ $1.35	63,400 c. y.	@ $1.35	North Line	17,050 c. y.	@ $1.35	F.& P.	53,514	100	53,514	85,590	100	85,590	23,018	100	23,018
Branches	4,906	1.35			South Line	2,773	1.35	Ore	6,623	100	6,623				3,744	100	3,744
Branches, Joint (159-371 of 1250)	535	1.35			Branches	3,745	1.35	Ore	729	100	729				5,056	100	5,056
					Nestoria to Houghton	19,820	1.35	F.& P.							26,757	100	26,757
	45,081		63,400			43,388			60,866		60,866	85,590		85,590	58,575		58,575
LOOSE ROCK AND HARDPAN:					Marquette to Nestoria												
Main Line	118,920 c. y.	@ $0.50	122,200 c. y.	@ $0.50	North Line	80,900 c. y.	$@ 0.50	F.& P.	59,460	100	59,460	61,100	100	61,100	40,450	100	40,450
Branches	14,718	0.50			South Line	8,318	0.50	Ore	7,359	100	7,359				4,159	100	4,159
Branches, Joint (159-371 of 2450)	1,050	0.50			Branches	11,236	0.50	Ore	525	100	525				5,618		5,618
					Nestoria to Houghton	29,700	0.50	F.& P.							14,850		14,850
	134,688		122,200			130,154			67,344		67,344	61,100		61,100	65,077		65,077

Riggs—1911—Exhibit 1		Hansel-1912-Exhibit 15		Riggs—1913—Exhibit 1-A			Alloc-ation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
CLEARING AND GRUBBING:		CLEARING:						$		$	$		$	$		$
Main Line	1,191.32 Acres $80.00	Main Line 830 Ac. @$40.00		Marquette to Nestoria	652.37 Ac. @ $80.00		F.& P.	95,306	100	95,306	33,200	100	33,200	52,190	100	52,190
Branches	136.98 80.00	Branches 130	40.00	Freight Branches	26.76	80.00	F.	10,958	100	10,958	5,200	100	5,200	2,141	100	2,141
Branches (Joint 150-371 of 22.26 Acres)	9.54 80.00	GRUBBING Main Line 250	100.00	South Line	83.00	80.00	Ore	763	100	763				6,640	100	6,640
		Branches 40	100.00	Branches	104.52	80.00	Ore				25,000	100	25,000	8,362	100	8,362
				Nestoria to Houghton Main Line	454.90	80.00	F.& P.							36,392	100	36,392
				Branches	11.40	80.00	F.				4,000	100	4,000	912	100	912
	1,337.84 Acres		1,250 Acres		1,332.95 Acres			107,027		107,027	67,400		67,400	106,637		106,637
RETAINING WALLS:																
A. Marquette, Front St., East end of Depot Grounds. Built of Sandstone laid in mortar Iron fence on top of wall.	178 c. y. @ 10.50	Excavation	42 c. y. @ $0.50	Same as Exhibit 1, 1911			P.				21			2,069		2,069
		Masonry	52 8.00					1,869	100	1,869						
								200	100	200	416					
B. Grading at Marquette Cut to L. S. & I. and coal dock; 2 retaining walls 745 ft. long, 15 ft. high at center and 2 ft. at ends		2 walls 855 ft. long Excavation for walls	1,500 c. y. 0.50	Same as Exhibit 1, 1911.				2,069		2,069	437	90	393	2,069		2,069
											750			31,467		28,703
Stone laid in cement	2,632 c. y. @ 10.50	Masonry	4,340 8.00					27,636	90	24,872	34,720					
Excavation	10,675 0.30	Back fill	1,900 0.50					3,203	100	3,203	950					
		Excavation for cut									36,420	70	25,494			
Back Fill	2,094 0.30		11,000 0.26					628	100	628	2,860	100	2,860			
								31,467		28,703	39,280		28,354	31,467		28,703

C. Approach to Dock, No. 4. 2 retaining walls under overhead bridge. Walls are 81 ft. long, 17 ft. high.			Excavation for walls 380	0.50	Same as Exhibit 1.	Ore				190			6,787		6,299
										5,440					
Trap rock in cement mortar	465 c. y. @	$10.50	Masonry 680	8.00			4,883	90	4,395	225					
Excavation	6,098	0.30	Back fill 450	0.50			1,829	100	1,829	5,855	85	4,977			
Back fill	250	0.30	Excavation cut 8,020	0.26			75	100	75	2,085	100	2,085			
							6,787		6,299	7,940		7,062	6,787		6,299
D. West Side of Lake St. 1 wall timber construction at ends and red sandstone at center, 714 ft. long.			327 ft. of masonry wall and 440 ft. of timber wall																
			Excavation		Same as Exhibit 1.	F.& P.							23,225		5,847
Red sandstone laid dry	322.5 c. y. @	$9.00	220 c. y.	0.50			2,903	50	1,452	110					
			Masonry							3,120					
Pile construction	1,700 ft.	0.40	390	8.00			680	20	136						
			Timber							3,230	50	1,615			
Timber walls	524.8 M.B.M.	36.64	8100 M.B.M.	38.00			19,229	20	3,846						
			Piles							3,078	25	770			
Excavation	108 c. y.	0.30	750 Lin.ft.	0.40			32	100	32						
			Iron							300	25	75			
Filling and smoothing	1,270	0.30	6,800 lbs.	0.035			381	100	381						
										238	25	59			
							23,225		5,847	6,846		2,519	23,225		5,847
E. 1 wall 30 ft. on Lake St., 175 ft. on Cross St. Cut			U Abutement W. Side Lake St.												
Red Superior sandstone laid in mortar	280 c. y. @	10.50	Masonry 830 c. y.	8.00			2,940	90	2,646	6,640					
			Excavation		Omitted										
Excavating	87	0.30	340	0.50			26	100	26	170					
Filling, cutting and smoothing	460	0.30	Fill between walls 1,450	0.50			138	100	138	725					
							3,104		2,810	7,535	60	4,521			

Riggs—1911—Exhibit 1			Hansel–1912–Exhibit 15	Riggs—1913—Exhibit 1-A		Alloc-ation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
							$		$	$		$	$		$
F. East Side Lake St. 1 wall 684 ft. long.				Same as Exhibit 1, West Side Lake St.											
Trap work laid in cement mortar	634	10.50		Same as Exhibit 1.		F.& P.	6,657	90	5,991				6,657	90	5,991
Excavation	228	0.30	Omitted	Same as Exhibit 1.			68	100	68				68	100	68
Cutting and smoothing	532	0.30		Same as Exhibit 1.			160	100	160				160	100	160
Tight board fence over portion of wall	1.013 M.B.M.	33.00		Same as Exhibit 1.			33	75	25				33	75	25
				Bracing and strengthening	45.00 M.B.M.	33.00							1,485	90	1,336
				Wrought iron	8,346 lbs	0.035							292	95	277
							6,918		6,244				8,695		7,857
G. Approach to Dock No. 5.															
2 walls 500 ft. long and 2 piers for overhead crossing.			U abutement south of	Same as Exhibit 1.		Ore							19,703		18,769
Plain concrete	2,198 c. y.	@ $8.50	Marquette Depot, 446				18,683	95	17,749						
Excavation	400	0.30	ft. long and pier				120	100	120						
Filling	3,000	0.30	Excavation				900	100	900						
			1,650 c. y.	@ $0.50						825					
			Masonry												
			3,775	8.00						30,200					
			Fill between walls												
			1,300	0.50						650					
							19,703		18,769	31,675	90	28,508	19,703		18,769
ISHPEMING:															
H. 1 wall 200 ft. long.															
Stone laid in mortar	167	10.50		Same as Exhibit 1.		F.& P.	1,754	85	1,491				1,805		1,542
Excavation	56	0.30	Omitted				17	100	17						
Cutting and filling	112	0.30					34	100	34						
							1,805		1,542				1,805		1,542
MICHIGAMME:															
I. 1 wall 500 ft. long.															
Stone laid in mortar	509	10.50		Same as Exhibit 1.		F.& P.	5,345	85	4,543				5,498		4,696

THIS PAGE

Excavation	139	0.30	Omitted			42	100	42							
Cutting and filling	370	0.30				111	100	111							
						5,498		4,696					5,498		4,696
J. 1 wall 200 ft. long.															
Stone laid in mortar	185	10.50		Same as Exhibit 1.	F.& P.	1,943	85	1,652					1,999		1,708
Excavation	56	0.30	Omitted			17	100	17							
Cutting and filling	129	0.30				39	100	39							
			MICHIGAMME:			1,999		1,708					1,999		1,708
K. Omitted			Retaining wall protecting turntable												
			Excavation	Omitted											
			40 c. y. @ $0.50						20						
			Masonry												
			60 8.00						480						
									500	90	450				
			NEGAUNEE:												
L. Omitted			Wooden retaining wall north of depot												
			Timber												
			30 M.B.M. 38.00	Omitted					1,140						
			Iron 1,000 lbs 0.035						35						
									1,175	90	1,058				
			HUMBOLDT												
M. Omitted			Retaining wall												
			Excavation	Omitted											
			25 c. y. 0.50						13						
			Masonry												
			30 8.00						240						
									253	90	228				

Riggs—1911—Exhibit 1	Hansel-1912-Exhibit 15	Riggs—1913—Exhibit 1-A		1911			1912			1913		
			Allocation	C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
	RIPRAP:			$		$	$		$	$		$
	Marquette to Nestoria											
	Mile Post											
	185.7 25 c.y. @ $2.00											
	50 C.R. 100% 50P.V.	Recapitulation Retaining Walls										
	187.3 70 c.y. @ $2.00											
	140 C.R. 100% 140P.V.	A		2,069		2,069	437		393	2,069		2,069
	188.0 330 c.y. @ $2.00											
	660 C.R. 100% 660P.V.	B		31,467		28,703	39,280		28,354	31,467		28,703
	191.6 65 c.y. @ $2.00											
	130 C.R. 100% 130P.V.	C		6,787		6,299	7,940		7,062	6,787		6,299
	192.7 110 c.y. @ $2.00											
	220 C.R. 100% 220P.V.	D		23,225		5,847	6,846		2,519	23,225		5,847
	Nestoria to Houghton											
	Mile Post	E		3,104		2,810	7,535		4,521			
	24.8 180 c.y. @ $2.00	F		6,918		6,244				8,695		7,857
	360 C.R. 100% 170P.V.											
	25.0 85 c.y. @ $2.00	G		19,703		18,769	31,675		28,508	19,703		18,769
	170 C.R. 100% 360P.V.											
	43.6 85 c.y. @ $2.00	H		1,805		1,542				1,805		1,542
	170 C.R. 100% 170P.V.	I		5,498		4,696				5,498		4,696
		J		1,999		1,708				1,999		1,708
		K					500		450			
		L					1,175		1,058			
		M					253		228			
				102,575		78,687	95,641		73,093	101,248		77,490
Omitted	Total Riprap											
	1900 C.R. 1,900P.V.	Omitted					1,900		1,900			

NESTORIA TO STATE LINE:																				
GRADING:																				
Main Line 101.47 Miles																				
Bessemer Branch 2.23																				
103.70 Miles																				
EARTHWORK:																				
	1,522,302 c. y.	@ $0.30		498,000 c. y.	@ $0.20	Main track 101.47 Mi.	1,629,815 c. y.	@ $0.30	F.& P.	456,691	100	456,691	99,640	100	99,640	488,944	100	488,944
6 trestles filled since 1900	59,513	0.30		1,174,700	0.26	Bessemer Br. 2.23 Mi.	50,000	0.30	F.	17,854	100	17,854	305,420	100	305,420	15,000	100	15,000
Branches, 10.56 Miles	84,480	0.30		133,200	0.40	Branches 19.23 Mi.	153,840	0.30	F.	25,344	100	25,344	53,280	100	53,280	46,152	100	46,152
Total	1,666,295 c. y.			1,805,900			1,833,655 c. y.			499,889		499,889	458,340		458,340	550,096		550,096
SHRINKAGE:																				
	154,954 c. y.	0.30		141,100	0.25	Main Line	159,954	0.30	F.& P.	46,486	100	46,486	35,275	100	35,275	47,986	100	47,986
						Bessemer Branch	5,000	0.30	F.							1,500	100	1,500
Total	154,954 c. y.			141,000 c. y.			164,954 c. y.			46,486		46,486	35,275		35,275	49,486		49,486
OVERHAUL, GRADING CROSSINGS:																				
Approaches and Depot Grounds	116,215 c. y.	0.30		22,000 c. y.	0.25		116,215 c. y.	0.30	F.& P.	34,864	100	34,864	5,500	100	5,500	34,864	100	34,864
Earthwork	1,666,295			1,805,900			1,833,655			499,889		499,889	458,340		458,340	550,096		550,096
Shrinkage	154,954			141,000			164,954			46,486		46,486	35,275		35,275	49,486		49,486
Overhaul	116,215			22,000			116,215			34,864		34,864	5,500		5,500	34,864		34,864
Total Earthwork	1,937,464 c. y.			1,968,900 c. y.			2,114,824 c. y.			581,239		581,239	499,115		499,115	634,446		634,446
SOLID ROCK:																				
	9,078 c. y.	1.35		7,600 c. y.	1.35		9,078 c. y.	1.35	F.& P.	12,255	100	12,255	10,260	100	10,260	12,255	100	12,255
LOOSE ROCK AND HARDPAN:																				
	18,156 c. y.	0.50		24,900	0.50		18,156	0.50	F.& P.	9,078	100	9,078	12,450	100	12,450	9,078	100	9,078
CLEARING AND GRUBBING:																				
Main Line	975.65 Acres	80.00		Clearing 780 Acres	40.00	Main line	956.85 Acres	80.00	F.& P.	78,052	100	78,052	31,200	100	31,200	76,548	100	76,548
Branches	63.36	80.00		Grubbing 230 Acres	100.00	Bessemer Branch	13.38 Acres	80.00	F.	5,069	100	5,069	23,000	100	23,000	1,070	100	1,070
						Branches	115.38 Acres	80.00	F.							9,230	100	9,230
Total	1,039.01 Acres			1,010 Acres			1,085.61 Acres			83,121		83,121	54,200		54,200	86,848		86,848
RIPRAP:																				
Omitted				Mile post 185.7 235 c. y.	@ $2.00	Omitted							470	100	470			

RECAPITULATION

	Quantities			1911		1912		1913	
	1911	1912	1913	C. R.	P. V.	C. R.	P. V.	C. R.	P. V.
EARTHWORK:				$	$	$	$	$	$
East of Marquette	2,247,921	2,413,100	2,332,597	674,376	674,376	625,365	625,365	699,779	699,779
Marquette to Houghton	2,458,881	2,410,100	2,447,155	737,684	737,684	618,375	618,375	734,146	734,146
Nestoria to State Line	1,666,295	1,805,900	1,833,655	499,889	499,889	458,340	458,340	550,096	550,096
Total c. y.	6,373,097	6,629,100	6,613,407						
SOLID ROCK:									
East of Marquette	15,162	24,800	15,162	20,469	20,469	33,480	33,480	20,469	20,469
Marquette to Houghton	45,081	63,400	43,388	60,866	60,866	85,590	85,590	58,575	58,575
Nestoria to State Line	9,078	7,600	9,078	12,255	12,255	10,260	10,260	12,255	12,255
Total c. y.	69,321	95,800	67,628						
LOOSE ROCK AND HARDPAN:									
East of Marquette	31,041	26,900	31,034	15,520	15,520	13,450	13,450	15,517	15,517
Marquette to Houghton	134,688	122,200	130,154	67,344	67,344	61,100	61,100	65,077	65,077
Nestoria to State Line	18,156	24,900	18,156	9,078	9,078	12,450	12,450	9,078	9,078
Total c. y.	183,885	174,000	179,344						
RETAINING WALLS:									
Marquette to Houghton				102,575	78,687	95,641	73,093	101,248	77,490
SHRINKAGE:									
East of Marquette	208,379	138,000	208,379	62,514	62,514	34,500	34,500	62,514	62,514
Marquette to Houghton	231,394	193,600	245,795	69,418	69,418	48,400	48,400	73,738	73,738
Nestoria to State Line	154,954	141,000	164,954	46,486	46,486	35,275	35,275	49,486	49,486
Total c. y.	594,727	472,600	619,128						

OVERHAUL, GRADING CROSSINGS, ETC.:									
East of Marquette	156,284	73,300	156,284	46,885	46,885	18,325	18,325	46,886	46,886
Marquette to Houghton	173,546	91,000	173,535	52,064	52,064	22,750	22,750	52,061	52,061
Nestoria to State Line	116,215	22,000	116,215	34,864	34,864	5,500	5,500	34,864	34,864
Total c. y.	446,045	186,300	446,034						
CLEARING AND GRUBBING:									
East of Marquette	2,072.07	2,370	2,114.86	165,769	165,769	127,800	127,800	169,189	169,189
Marquette to Houghton	1,337.84	1,250	1,332.95	107,027	107,027	67,400	67,400	106,637	106,637
Nestoria to State Line	1,039.01	1,010	1,085.61	83,121	83,121	54,200	54,200	86,848	86,848
Total Acres	4,448.92	4,630	4,533.42						
CORDUROY CONSTRUCTION:									
East of Marquette	20 Miles	20 Miles	20 Miles	11,280	11,280	10,000	10,000	11,280	11,280
				2,879,484	2,855,596	2,438,201	2,415,653	2,959,743	2,935,985
RIPRAP:									
East of Marquette		870				1,740	1,740		
Marquette to Houghton		950				1,900	1,900		
Nestoria to State Line		235				470	470		
Total c. y.		2,055							
Total in Michigan				2,879,484	2,855,596	2,442,311	2,419,763	2,959,743	2,935,985
ADDED BY RIGGS IN EXHIBIT 50:									
Amount Transferred from Terminals				111	111				
Total				2,879,595	2,855,707	2,442,311	2,419,763	2,959,743	2,935,985

COMPARISON OF THE 1191, 1912 AND 1913 APPRAISALS

	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
				C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
	SAULT STE. MARIE TO MARQUETTE			$		$	$		$	$		$
1	Over Portage Ave.' Sault Ste. Marie Included in schedule No. 36 Terminals, page 285	Joint ownership, D. S. S. & A. R'y, ½ interest Excavation and back fill 400 c. y. @ $0.50 Masonry 340 c. y. 8.00 Steel 40,000 lbs 0.04 Bridge ties 2.8 M.B.M. 34.00 Guard rail 0.5 M.B.M. 43.00 Iron 400 lbs 0.035					200 2,720 1,600 95 22 14					
							4,651					
2	Over Michigan and Lake Superior Power —3 Concrete piers.	Apportioned to D. S. S. & A. (½) Co.'s Canal—4 spans—56' 8" deck	As per Exhibit 1, ½ interest plate girder—2 concrete abutments				2,326	75	1,745	2,576		2,510
	Excavation 234 c. y. @ $2.00 Backfill 80 c. y. 0.30 Concrete 686 c. y. 9.00 Steel 163,300 lbs 0.04 Bridge ties 29 M.B.M. 43.64 Guard rail 4.82 tons 14.00 Track spikes for guard rail (W.I.) 6.27 cwt. 2.10 Guard rail—wooden 1.82 M.B.M. 43.64 Boat spikes for wooden guard rail 478 0.035	Joint ownership, D. S. S. & A. R'y, ½ interest. Excavation 235 c. y. @ $2.00 Backfill 80 c. y. 0.50 Concrete 880 c. y. 8.00 Steel 163,300 lbs 0.04 Special construction Bridge ties 11.4 M.B.M. 34.00 Guard rail wooden 1.8 M.B.M. 43.00 Guard rail—scrap rail 4.8 tons 12.00 Iron 1200 lbs 0.035		468 24 6,174 6,532 1,266 67 13 79 17	100 100 82 82 50 100 82 50 82	468 24 5,063 5,356 633 67 11 40 14	470 40 7,040 6,532 3,000 388 77 58 42					
							17,647					
		Apportioned to D.S.S. & A. (½)	As per Exhibit 1, ½ interest (See Exhibit 50)	14,640		11,676	8,824	75	6,618	8,167		6,125

6 Wooden Howe Truss, deck, 128' span, pile abutments, 326' pile trestle approach—Brimley (WaiskaRiver)

Howe Truss								As per Exhibit 1															
Timber	60.54 M.B.M.	$43.64	Piles	2340 lin. ft.	$0.40			Deduct:						2,642	50	1,321	936	60	562				
Wrought iron	27,930 lbs	0.035	Timber	60.2 M.B.M.	44.00			Scrap rail						978	80	782	2,649	40	1,060				
								2.3 tons @	$14.00	$32	100	$32											
Cast iron	20,460 lbs	0.035	Timber	116.0 M.B.M.	38.00			Scrap rail						716	80	573	4,408	60	2,645				
								6.29 tons	14.00	88	100	88											
Bridge ties	129	2.08¼	Iron	66,260 lbs	0.035			Track spikes						269	50	135	2,319	60	1,391				
								2.97 cwt.	2.10	6	80	5											
Guard rail (scrp rail)	2.3 tons	14.00	Bridge ties	22.70 M.B.M.	34.00			Track spikes						32	100	32	772	60	463				
								8.18 cwt.	2.10	17	80	14											
Track spikes	2.97 cwt.	2.10						Total deductions		143		139		6	80	5							
Abutments																							
Piles	3.20 ft.	0.40												128	60	77							
Timber	13.68 M.B.M.	43.64						Total as per Exhibit 1			$10,874		$6,303	597	50	299							
Wrought iron	939 lbs	0.035						Deduct			143		139	33	80	26				10,731		6,164	
Cast iron	300 lbs	0.035												11	80	9							
Trestle Approach								Add timber 15.257 M.B.M. @ $43.64												666	95	633	
Piles	2,780 ft.	0.40												1,112	60	667							
Timber	70.028 M.B.M.	43.64												3,056	50	1,528							
Wrought iron	9,140	0.035												320	80	256							
Cast iron	5,323 lbs	0.035												186	80	149							
Bridge ties	327	2.08¼												683	50	342							
Guard rail (scrap rail)	6.29 tons	14.00												88	100	88							
Track spikes for guard rail (W.L.)	8.18 cwt.	2.10												17	80	14							
														10,874		6,303	11,084		6,121	11,397		6,797	

	Riggs—1911—Exhibit 1			Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A					1911			1912			1913		
												C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
												$		$	$		$	$		$
10	Taquemenon River—70' Howe Truss, deck, pile abutments, 112' trestle approach.						As per Exhibit 1.													
	Howe Truss:			Piles	680 lin. ft. @	$0.40	Deduct:—													
	Timber	24.210 M.B.M.	43.64	Timber	37.3 M.B.M.	44.00	Scrap rail 1.3 tons @	$14.00	$18	100	$18	1,057	52	550	272	60	163			
	Wrough iron	8.420 lbs	0.035				Scrap rail 2.5 tons	14.00	35	100	35	295	84	248	1,641	40	656			
	Cast iron	7,980 lbs	0.035	Timber	21.7 M.B.M.	38.00	Track spikes 1.64 cwt.	2.10	3		3	279	84	234	825	60	495			
	Bridge ties	71	2.08¾	Iron	27,076 lbs	0.035	Track spikes 3.25 cwt.	2.10	7	84	6	148	52	77	948	60	569			
	Guard rail (scrap)	1.3 tons	14.00	Bridge ties	9.1 M.B.M.	34.00						18	100	18	309	60	185			
	Track spikes for guard rail	1.64 cwt.	2.10				Total deductions		63		62	3		3						
	Abutments																			
	Piles	400 ft.	0.40				Total as per Exhibit 1		$3,428		$2,111	160	68	109						
	Timber	4.088 M.B.M.	43.64				Deduct		63		62	178	52	93				3,365		2,049
	Wrought iron	643 lbs	0.035									23	84	19						
	Cast iron	143 lbs	0.035				Add timber	5.242 M.B.M.	@	43.64		5	84	4				229	95	218
	Trestle Approach																			
	Piles	780 ft.	0.40									312	68	212						
	Timber	13.301 M.B.M.	43.64									580	52	302						
	Wrought iron	2,020 lbs	0.035									71	84	60						
	Cast iron	599 lbs	0.035									21	84	18						
	Bridge ties	113	2.08¾									236	52	123						
	Guard rail (scrap rail)	2.5 tons	14.00									35	100	35						
	Track spikes for guard rail (W.I.)	3.25 cwt.	2.10									7	84	6						
												3,428		2,111	3,995		2,068	3,594		2,267

27 Sage—Taquemenon River—51½' plate girder half deck, 254' of trestle approach, 16 spans of 16' bents 8' high.

Bridge								As per Exhibit 1.															
Plate girders	34,036 lbs	@	$ 0.04	Steel	34,000 lbs	@	$0.04	Deduct :—						1,361	82	1,116	1,360	65	884				
Bridge ties	7.349 M.B.M.		43.64	Piles	1,260 lin. ft.		0.40	Scrap rail						321	50	161	504	60	302				
								.92 tons @ $14.00		$13	100	$13											
Guard rail (timber)	.412 M.B.M.		43.64	Timber	32.4 M.B.M.		43.00	Scrap rail 4.97 tons	14.00	70	100	70		18	50	9	1,393	60	836				
(Scrap rail)	.92		14.00	Timber	1.7 M.B.M.		38.00	Track spikes 1.23 cwt.	2.10	3	82	2		13	100	13	65	60	39				
Boat spikes for guard rail	106 lbs		0.035	Iron	4,580 lbs		0.035	Track spikes 6.46 cwt.	2.10	14	82	11		4	82	3	160	60	96				
Track spikes for guard rail	1.23 cwt.		2.10	Bridge ties	15.28 M.B.M.		34.00	Total deductions.....		100		96		3	82	2	520	60	312				
Abutments																							
Piles	500 ft.		0.40											200	64	128							
Timber	3.696 M.B.M.		43.64					Total as per Exhibit 1		$4,779		$3,053		161	50	81							
Wrought iron	635		0.035					Deduct		100		96		22	82	18				4,679		2,957	
Cast iron	165 lbs		0.035											6	82	5							
Trestle								Add timber 11.887 M.B.M. @ $43.64												519	95	493	
Piles	1,600 ft.		0.40											640	64	410							
Timber	28.670 M.B.M.		43.64											1,251	50	626							
Wrought iron	3,564 lbs		0.035											125	82	103							
Cast iron	1,085 lbs		0.035											38	82	31							
Bridge ties	255		2.08¾											532	50	266							
Guard rail (Scrap rails)	4.97 tons		14.00											70	100	70							
Track spikes for guard rail (W. I.)	6.46 cwt.		2.10											14	82	11							
														4,779		3,053	4,002		2,469	5,198		3,450	

	Riggs—1911—Exhibit 1			Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A				1911			1912			1913		
											C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
											$		$	$		$	$		$
28	1.5 M. west of Sage—Taquemenon River—51⅓' plate girder, half deck, 160' of trestle approach, 10 spans of 16 beents 8' high.																		
	Bridge						As per Exhibit 1												
	Plate girders	34,036 lbs @	$ 0.04	Steel	34,000 lbs @	$0.04	Deduct:—				1,361	82	1,116	1,360	65	884			
	Bridge ties	7.349 M.B.M.	43.64	Piles	860 lin.ft.	0.40	Scrap rail .92 tons @ $14.00	$13	100	$13	321	50	161	344	60	206			
	Guard rail (Timber)	.412 M.B.M.	43.64	Timber	19.6 M.B.M.	43.00	Scrap rail 3.37 tons	14.00	47 100	47	18	50	9	843	60	506			
	Guard rail (Scrap rail)	.92 tons	14.00	Timber	1.7 M.B.M.	38.00	Track spikes 1.23 cwt.	2.10	3 82	2	13	100	13	65	60	39			
	Boat spikes for guard rail (W.I.)	106 lbs	0.035	Iron	2,610 lbs	0.035	Track spikes 4.38	2.10	9 82	7	4	82	3	91	60	55			
	Track spikes for guard rail (W. I.)	1.23 cwt.	2.10	Bridge ties	10.58 M.B.M.	34.00	Total deductions		72	69	3	82	2	360	60	216			
	Abutments																		
	Piles	500 ft.	0.40								200	64	128						
	Timber	3.096 M.B.M.	43.64				Total as per Exhibit 1		$3,802	$2,499	161	50	81						
	Wrought iron	635 lbs	0.035				Deduct		72	69	22	82	18				3,730		2,430
	Cast iron	165 lbs	0.035								6	82	5				327	95	311
	Trestle						Add timber 7.488 M.B.M. @ $43.64												
	Piles	1,000 ft.	0.40								400	64	256						
	Timber	18.159 M.B.M.	43.64								792	50	396						
	Wrought iron	2,389 lbs	0.035								84	82	69						
	Cast iron	700 lbs	0.035								25	82	20						
	Bridge ties	161	2.08¼								336	50	168						

| | | |

Bridge No.	Riggs—1911—Exhibit 1			Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A				1911			1912			1913		
											C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
											$		$	$		$	$		$
93	M. P. 79.7—Fox River—51½′ plate girde through—Pile abutments, 6′ to 8′ hig h. 132½′ trestle approach, 9 bents 6′ high.																		
	Bridge						As per Exhibit 1												
	Plate girder	33,740 lbs @	$0.04	Steel	40,000 lbs @	$0.04	Deduct:—				1,350	76	1,026	1,600	65	1,040			
	Bridge ties (53)	7.349 M.B.M.	43.64	Piles	740 lin. ft.	0.40	Scrap rail 0.92 ton @ $14.00		$13	100 $13	321	50	161	296	50	148			
	Guard rail (timber)	0.412 M.B.M.	43.64	Timber	16.3 M.B.M.	43.00	Scrap rail 2.83 ton	14.00	40	100 40	18	50	9	701	50	351			
	Guard rail (Scrap rail)	0.92 tons	14.00	Timber	1.7 M.B.M.	38.00	Track spikes 1.23 cwt.	2.10	3	76 2	13	100	13	65	50	33			
	Boat spikes for timber guard rail (W.I.)	106 lbs	0.035	Iron	2,220 lbs	0.035	Track spikes 3.68 cwt.	2.10	8	76 6	4	76	3	78	50	39			
	Track spikes for scrap guard rail	1.23 cwt.	2.10	Bridge ties	9.2 M.B.M.	34.00	Total deductions		64	61	3	76	2	313	50	156			
	Abutments						Total as per Exhibit 1	3,554		2,201	200	52	104						
	Piles	500 ft.	0.40				Deduct		64	61	161	50	81				3,490		2,140
	Timber	3.696 M.B.M.	43.64								22	76	17						
	Wrought iron	635 lbs	0.035				Add timber 8.586 M. B. M. @ 43.64				6	76	5				375	95	356
	Cast iron	165 lbs	0.035																
	Trestle																		
	Piles	900 ft.	0.40								360	52	187						
	Timber	15.564 M.B.M.	43.64								679	30	340						
	Wrought iron	2,027 lbs	0.035								71	76	54						
	Cast iron	409 lbs	0.035								14	76	11						
	Bridge ties	136	2.06¾								284	50	142						

	Guard rail (scrap rail)	2.83 tons	14.00												40	100	40								
	Track spikes for guard rail	3.68 cwt.	2.10												8	76	6								
158½	Munising Junction—27½′ through plate			girder—Stone abutmnts.											3,554		2,201	3,053		1,767	3,865		2,496
	Bridge							As per Exhibit 1.																	
	Plate girder	13,375 lbs @	$0.04	Excavation	280 c. y. @	$0.50		Deduct:—							535	82	439	140	80	112					
	Bridge ties (39)	5.408 M.B.M.	43.64	Masonry	450 c.y.	8.00		Scrap rail							236	50	118	3,600	80	2,880					
								1.07 tons @	$14.00	$15	100	$15													
	Guard rails (timber)	0.560 M.B.M.	43.64	Steel	1,700 lbs	0.04		Track spikes 1.30 cwt.	2.10	3		3			24	50	12	68	60	41					
	Guard rails (Scrap rail)	1.07 tons	14.00	Timbers	0.2 M.B.M.	43.00		Total deductions		18		18			15	100	15	9	60	5					
	Boat spikes for wooden guard rail	108 lbs	0.035	Iron	85 lbs	0.035									4	82	3	3	60	2					
	Track spikes for scrap guard rail	1.39 cwt.	2.10	Bridge ties	1.4 M.B.M.	34.00		Total as per Exhibit 1		4,437		3,558			3		3	48	60	29					
								Deduct		18		18									4,419		3,540
	Abutments Stone	362 c. y.	10.00												3,620	82	2,968								
															4,437		3,558	3,868		3,069	4,419		3,540
175	Au Train—50′ through plate girder—Abu			temnts 12′ high—148′ of approach				—16 bents (last one double row for																	
	old abutments)—58′ added in 1909 in			5 spans, ends are new abutments.																					
	Bridge							As Per Exhibit 1																	
	Plate girders	32,200 lbs @	$0.04	Steel	43,000 lbs @	$0.04		Deduct:—							1,288	96	1,236	1,720							
	Bridge ties (51)	7.072 M.B.M.	43.64	Piles	1,460 lin. ft.	0.40		Scrap rail							309	88	272	584							
	Guard rails (timber)	0.400 M.B.M.	43.64	Timber	28.62 M.B.M.	43.00		0.90 tons @	$14.00	$13	100	$13													
								Scrap rail 4.46 tons	14.00	62	100	62			17	88	15	1,231							
	Guard rails (scrap rail)	0.900 tons	14.00	Timber	1.7 M.B.M.	38.00		Track spikes 1.17 cwt.	2.10	2		2			13	100	13	65							
	Boat spikes for wooden guard rail	102 lbs	0.035	Iron	4,360 lbs	0.035		Track spikes 5.80	2.10	12	82	10			4		4	153							

Bridge No.	Riggs—1911—Exhibit 1			Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A			1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
										$		$	$		$	$		$
	Track spikes for scrap rail guard rail	1.17 cwt.	2.10	Bridge ties	12.8 M.B.M.	34.00	Total deductions	89	87	2		2	435					
	Abutments																	
	Piles	500 ft.	0.040				Total as per			200	92	184						
	Timber	3.696 M.B.M.	43.64				Exhibit 1	4,783	3,529	161	88	142						
							Deduct	—89	—87							4,694		3,442
	Wrought iron	635 lbs	0.035							22	96	21						
	Cast iron	165 lbs	0.035							6		6						
	Trestle						Add timber	9.641 M.B.M. @	$43.64							421	95	400
	Piles	2,640 ft.	0.40							1,056	64	676						
	Timber	22.456 M.B.M.	43.64							980	50	490						
	Wrought iron	4,650 lbs	0.035							163	82	134						
	Cast iron	1,597 lbs	0.035							56	82	46						
	Bridge ties	207	2.08¾							432	50	216						
	Guard rail (scrap rail)	4.46 tons	14.00							62	100	62						
	Track spikes for guard rail	5.80 cwt.	2.10							12	82	10						
										4,783		3,529	4,188	70	2,932	5,115		3,842
179	M. P.—129.5 Rock River—46′ deck plate			girder. Approach—23′ on west, 86′			on east.											
	Pile abutments 11′ high.			Concrete abutments, 11′ high.														
	Bridge						As per exhibit 1.											
							Deduct:—											
	Plate girder	28,030 lbs @	$0.04	Excavation	120 c. y. @	$2.00	Abutments			1,121	98	1,099	240	95	228			
	Bridge ties	6.517 M.B.M.	43.64	Masonry	260 c. y.	8.00	Piles			284	94	267	2,080	95	1,976			
							500 ft. @	$0.40	$200 96	$192								
	Guard rails (timber)	0.368 M.B.M.	43.64	Steel	33,000 lbs	0.04	Timber 3.696 M.B.M.	43.64	161 94	151	16	94	15	1,320	70	924		

	Guard rails (scrap rail)	0.82 tons	14.00	Piles	480 lin. ft.	0.40	Wrought iron 635 lbs	0.035	22	98	22	11	100	11	192	60	115							
	Boat spikes for wooden guard rail	94 lbs	0.035	Timber	12.8 M.B.M.	43.00	Cast iron 165 lbs	0.035	6	·	6	3		3	550	60	330							
	Track spikes for scrap guard rail	1.07 cwt.	2.10	Iron	1,730 lbs	0.035	Trestle approach																		
	Abutments			Bridge ties	7.8 M.B.M.	34.00	Piles 1,480 ft.	0.40	592	56	332	2		2	61	60	38							
	Piles	500 ft.	0.40				Timber 16.344 M.B.M.	43.64	713	50	356	200	96	192	265	60	159							
	Timber	3.696 M.B.M.	43.64				Wrought iron 2,526 lbs	0.035	88	78	69	161	94	151											
	Wrought iron	635 lbs	0.035				Cast iron 973 lbs	0.035	34	78	27	22	98	22											
	Cast iron	165 lbs	0.035				Bridge ties 111	2.08¾	232	50	116	6		6											
	Trestle Approach						Guard rail (scrap rail) 2.36 tons	14.00	33	100	33	592	56	332											
	Piles	1,480 ft.	0.40				Track spikes for guard rail 3.07 cwt.	2.10	6	78	5	713	50	356											
	Timber	16.344 M.B.M.	43.64									88	78	69											
	Wrought iron	2,526 lbs	0.035				Bridge Scrap rail 0.82 tons	14.00	11	100	11	34	78	27											
	Cast iron	973 lbs	0.035				Track spikes for scrap rail 1.07 cwt.	2.10	2		2	232	50	116											
	Bridge ties	111	2.08¾				Total deductions....		2,100		1,322	33	100	33											
	Guard rail (scrap rail)	2.36 tons	14.00				Total as per Exhibit 1		3,524		2,706	6	78	5											
	Track spikes for guard rail	3.07 cwt.	2.10				Deduct		2,100		1,322												1,424		1,384
							Add concrete 160 c. y. @ $9.00					3,524		2,706	4,708		3,770					1,440	95	1,368
																							2,864		2,752
186	Deerton—Laughing Fish River—56' through Howe truss on rock filled crib, abutments 9' high, 16' of trestle on east side, 1 bent 8' high.			Deerton—Laughing Fish River—46' through girder, concrete abutments 9' high, 16' trestle on east side, 1 bent 8' high.			45' through plate girder 1911. concrete piers, wing walls and protection walls.																		

	Riggs—1911—Exhibit 1		Hansel—1912—Exhibit 15		Riggs—1913—Exhibit 1-A		1911			1912			1913		
							C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
							$		$	$		$	$		$
	Howe Truss				Bridge:—										
	Timber	18.544 M.B.M. @ $43.64	Excavation	50 c. y. @ $2.00	Plate girder	28,000 lbs @ $0.04	809	50	405	100	95	95	1,120	98	1,098
	Wrought iron	6,311 lbs .035	Masonry	80 c.y. 8.00	Bridge ties (46)		221	66	146	640	95	608			
	Cast iron	3,321 lbs .035	Piles	60 lin. ft. 0.40		6.378 M.B.M. 43.64	116	66	77	24	60	14	278	94	261
	Bridge ties	57 2.08¾	Steel	35,000 lbs 0.04	Guard rail		119	50	60	1,400	70	980			
	Guard rail		Timber	2.6 M.B.M. 43.00	(timber)	0.360 M.B.M. 43.64				112	60	67	16	94	15
	(scrap rail)	1.3 tons 14.00	Iron	380 lbs 0.035	Boat spikes	92 lbs 0.035	18	100	18	13	60	8	3		3
	Track spikes	1.69 cwt. 2.10	Bridge ties	4.3 M.B.M. 34.00			4	66	3	146	60	88			
					Abutments										
					Concrete	150 c.y. 9.00							1,350	95	1,282
	Abutments														
	Piles	400 ft. 0.40					160	50	80						
	Timber	10.000 M.B.M. 43.64					436	50	218						
	Wrought iron	1,672 lbs .035					59	66	39						
	Rock fill	15 c.y. 2.00					30	100	30						
	Trestle approach														
	Piles	100 ft. 0.40					40	50	20						
	Timber	2.131 M.B.M. 43.64					93	50	47						
	Wrought iron	293 lbs .035					10	66	7						
	Cast iron	56 lbs .035					2	66	1						
	Bridge ties	17 2.08¾					36	50	18						
	Guard rail														
	(scrap rail)	0.84 tons 14.00					12	100	12						
	Track spikes for guard rail	1.09 cwt. 2.10					2	66	1						
							2,167		1,182	2,435		1,860	2,767		2,659
189	Sand River—51½′ deck plate girder—Pile abutments 12′ high, 63′ trestle approach on west, 4 bents, 4 spans, 42.5′ trestle approach on east, 3 bents, 3 spans.														
	Bridge:—				As per Exhibit 1.										
	Plate girder	34,331 lbs @ $0.04	Steel	32,000 lbs @ $0.04	Deduct:—		1,373	72	989	1,280	65	832			

	Bridge ties (53)	5.936 M.B.M.	43.64	Piles	620 lin. ft.	0.40	Scrap rail 0.92 tons @	$14.00	13	100	13	259	50	130	248	50	124								
	Guard rail (timber)	.412 M.B.M.	43.64	Timber	13.1 M.B.M.	43.00	Scrap rail 2.30 tons	14.00	32	100	32	18	50	9	563	50	282								
	Guard rail (scrap rail)	.92 tons	14.00	Timber	1.7 M.B.M.	38.00	Track spikes 1.2 cwt.	2.10	3	72	2	13	100	13	65	50	32								
	Boat spikes for wooden guard rail	106 lbs	0.035	Iron	1,830 lbs	0.035	Track spikes 2.99 cwt.	2.10	6	72	4	4	72	3	64	50	32								
	Track spikes for scrap gd. rail	1.2 cwt.	2.10	Bridge ties	7.9 M.B.M.	34.00	Total deductions		54		51	3	72	2	269	50	135								
	Abutments																								
	Piles	500 ft.	0.40				Total as per Exhibit 1		3,061		1,880	200	50	100											
	Timber	3.696 M.B.M.	43.64									161	50	81											
	Wrought iron	635 lbs	0.035				Deduct		54		51	22	72	16							3,007			1,829	
	Cast iron	165 lbs	0.035									6	72	4											
	Trestle Approach						Add timber 4.937 M.B.M. @ $43.64														215	95		204	
	Piles	720 ft.	0.40									288	50	144											
	Timber	8.817 M.B.M.	43.64									385	50	193											
	Wrought iron	1,456 lbs	0.035									51	72	37											
	Cast iron	420 lbs	0.035									15	72	11											
	Bridge ties	108	2.08¾									225	50	112											
	Guard rail (scrap rail)	2.30 tons	14.00									32	100	32											
	Track spikes for guard rail	2.99 cwt.	2.10									6	72	4											
												3,061		1,880	2,489		1,437	3,222			2,033				
192	Chocolay River—61½′ through plate girder, pile abutments 9′ and 16′ high, 18 .5′ trestle approach to west, 3 bents 10′ high, 161′ trestle approach to east, 8 bents 18′ high.																								
	Bridge						As per Exhibit 1.																		
	Plate girder	44,616 lbs @	$0.04	Steel	50,000 lbs @	$0.04	Deduct:—					1,785	74	1,321	2,000	65	1,300								
	Bridge ties (63)	8.736 M.B.M.	43.64	Piles	1,880 lin.ft.	0.40	Scrap rail 1.1 tons @	$14.00	$15	100	$15	381	50	191	752	50	376								
	Guard rail (timber)	0.492 M.B.M.	43.64	Timber	21.3 M.B.M.	43.00	Scrap rail 3.72 tons	14.00	52	100	52	21	50	10	916	50	458								
	Guard rail (scrap rail)	1.1 tons	14.00	Timber	1.7 M.B.M.	38.00	Track spikes 1.43 cwt.	2.10	3	74	2	15	100	15	65	50	33								
	Boat spikes for wooden gd. rail	126 lbs	0.035	Iron	2,690 lbs	0.035	Track spikes 4.84 cwt.	2.10	10	74	7	4	74	3	94	50	47								
	Track spikes for scrap gd. rail	1.43 cwt.	2.10	Bridge ties	12.1 M.B.M.	34.00	Total deductions		80		76	3	74	2	411	50	206								

Bridge No.	Riggs—1911—Exhibit 1			Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A			1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
										$		$	$		$	$		$
	Abutments																	
	Piles	500 ft.	0.40							200	50	100						
	Timber	3.696 M.B.M.	43.64				Total as per			161	50	81						
	Wrought iron	635 lbs	0.035				Exhibit 1	4,946	2,991	22	74	16						
	Cast iron	165 lbs	0.035				Deduct	80	76	6	74	4				4,866		2,915
	Trestle Approaches																	
	Piles	1,420 ft.	0.40							568	50	284						
	Timber	26.325 M.B.M.	43.64				Add timber 8.401 M.B.M. @ $43.64			1,149	50	575				367	95	349
	Wrought iron	3,950 lbs	0.035							138	74	102						
	Cast iron	1,452 lbs	0.035							51	74	38						
	Bridge ties	182	2.08¼							380	50	190						
	Guard rail (scrap rail)	3.72 tons	14.00							52	100	52						
	Track spikes for guard rail	4.84 cwt.	2.10							10	74	7						
										4,946		2,991	4,238		2,420	5,233		3,264
							Total Sault Ste. Marie to Marquette			66,864		45,458	60,334		39,453	65,437		46,334
	St. Ignace to Soo Junction:																	
36A	M. P. 16.3—51½'through plate girder, pile abutments, 32' trestle approach each end.						As per Exhibit 1.											
	Bridge						Deduct:—			1,350	74	999	1,600	65	1,040			
	Plate girder	33,740 lbs @	$0.04	Steel	40,000 lbs @	$0.04	Scrap rail			321	50	161	200	50	100			
	Bridge ties	7.349 M.B.M.	43.64	Piles	500 lin. ft.	0.40	0.92 tons @ $14.00	13	100 13									
	Guard rail (timber)	.412 M.B.M.	43.64	Timber	8.7 M.B.M.	43.00	Scrap rail			18	50	9	374	50	187			
							1.79 tons $14.00	25	100 25									
	Guard rail (Scrap Rail)	.92 tons	14.00	Timber	1.7 M.B.M.	38.00	Track spikes 1.2 cwt. 2.10	3	74 2	13	100	13	65	50	33			
	Boat spikes for wooden gd. rail	106	0.035	Iron	1,410 lbs	0.035	Track spikes											
	Track spikes for scrap gd. rail	1.2 cwt.	2.10	Bridge ties	4.2 M.B.M.	34.00	2.33 cwt. 2.10	5	74 4	4	74	3	49	50	25			
										3	74	2	143	50	71			

	Abutments																						
	Piles	500 ft.	0.40																				
	Timber	3.696 M.B.M.	43.64																				
	Wrought iron	635 lbs	0.035																				
	Cast iron	165 lbs	0.035																				
	Trestle Approaches																						
	Piles	400 ft.	0.40																				
	Timber	4.678 M.B.M.	43.64																				
	Wrought iron	94 lbs	.035																				
	Cast iron	304 lbs	.035																				
	Bridge ties	66	2.08¾																				
	Guard rail (scrap rail)	1.79 tons	14.00																				
	Track spikes for guard rail	2.33 cwt.	2.10																				

Bridge No.	Riggs—1911—Exhibit 1			Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A			1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
	Track spikes for guard rail	1.39 cwt.	2.10	Bridge ties	0.85 M.B.M.	34.00	Total as per Exhibit 1	1,496	764	$ 3	50	$ 2	$ 29	50	$ 15	$		$
	Abutements						Deduct	18	17							1,478		747
	Masonry	122.8 c. y.	10.00							1,228	50	614						
	Excavation	32.3 c .y.	0.50							16	100	16						
										1,496		764	1,510		1,123	1,478		747
206	156.5 miles—18′ span I beams on masonry abutments, 11′ high.																	
	Bridge						As per Exhibit 1											
	Steel	2,880 lbs @	$0.04	Excavation	60 c. y. @	$0.50	Deduct:—			115	50	58	30	80	24			
	Bridge ties	2.432 M.B.M.	43.64	Masonry	160 c. y.	8.00	Scrap rail			106	50	53	1,280	80	1,024			
	Guard rail (wooden)	.480 M.B.M.	43.64	Steel	6,600 lbs	0.04	1.07 tons @ $14.00 $15 100 $15											
	Guard rail (scrap rail)	1.07 tons	14.00	Timber	0.14 M.B.M.	43.00	Track spikes 1.39 cwt. 2.10 3 50 2			21	50	10	264	50	132			
	Boat spikes for guard rail	88 lbs	0.35	Iron	55 lbs	0.035	Total deductions.....	18	17	15	100	15	6	50	3			
	Track spikes for guard rail	1.39 cwt.	2.10	Bridge ties	0.90 M.B.M.	34.00				3	50	2	2	50	1			
	Abutments						Total as per Exhibit 1	1,704	871	3	50	2	31	50	16			
	Excavation	41 c. y.	.50				Deduct	18	17							1,686		854
	Masonry	142 c. y.	10.00							21	100	21						
										1,420	50	710						
										1,704		871	1,613		1,200	1,686		854
216½	44′ deck plate girder on concrete abutments. Double track over Negaunee Mine Branch.																	
	Bridge						As per Exhibit 1											
	Steel	51,788 lbs @	$0.04	Excavation	400 c. y. @	$0.50	Deduct:—			2,072	98	2,031	200					
	Bridge ties	12.320 M.B.M.	43.64	Masonry	620 c. y.	8.00	Scrap rail			538	94	506	4,960					
	Guard rail (wooden)	1.040 M.B.M.	43.64	Steel	54,000 lbs	0.04	3.21 tons @ $14.00 $45 100 $45											
	Guard rails			Timber	.M.B.M 0.7	43.00	Track spikes 4.17 cwt. 2.10 9 9			5	94	5	2,160					
	(scrap rail)	3.21 tons	14.00	Iron	260 lbs	0.035				45	100	45	30					
	Boat spikes for Guard Rail	266 lbs.	0.035				Total deductions.....	54	54				9					
										9		9						

	Track spikes for Guard Rail	4.17 cwt.	2.10	Bridge ties	4.4 M.B.M.	34.00	Total as per Exhibit 1		10,560	10,333	9		9	190.00			10,506	10,279
	Abutments						Deduct		54	54								
	Excavation (earth)	320 c. y.	0.50								160	100	160					
	Concrete	858 c. y.	9.00								7,722	98	7,568					
											10,560		10,333	7,509	95	7.134	10,506	10,279
223	Negaunee—60′ through plate girder. Double track over C. & N. W. Concrete abutments.			M. P. 166.7—Negaunee. Two single track bridges over C. & N. W. R. R. One 60′ through plate girder, steel I beam ties, masonry abutments. One 60′ pile trestle.			As per Exhibit 1, page 55											
	Bridge						Deduct											
	Steel	85,790 lbs @	$0.04	Excavation	110 c. y. @	$ 0.50	Scrap rail				3,432	96	3,295	55				
	Bridge ties	18.176 M.B.M.	43.64	Masonry	225 c. y.	8.00	3.21 tons @	$14.00	$45	100 $45	793	88	698	1,800				
	Guard rail (wooden)	1.280 M.B.M.	43.64	Piles	725 lin. ft.	0.40	Track spikes 4.17 cwt.	2.10	9	9	56	88	49	290				
	Guard rail (scrap rail)	3.21 tons	14.00	Rip rap	45 c. y.	2.00	Total deductions.....		54	54	45	100	45	90				
	Boat spikes for wooden gd. rail	330 lbs	0.035	Steel	77,000 lbs	0.04	Total as per Exhibit 1		11,347	10,834	12		12	3,080				
	Track spikes for scrap rail	4.17 cwt.	2.10	Timber	8.0 M.B.M.	43.00	Deduct		54	54	9		9	344			11,293	10,780
	Abutments			Timber	9.7 M.B.M.	38.00								369				
	Excavation (Earth)	320 c. y.	.50	Iron	1,140 lbs	0.035					160	100	160	40				
	Concrete	760 c. y.	9.00	Bridge ties	0.5 M.B.M.	34.00					6,840	96	6,566	17				
											11,347		10,834	6,085	85	5,172	11,293	10,780
226	Jackson Mine—51½′ through plate girder.			Pile abutments 18′ high, 32′ trestle			approach, 2 bents 18′ high. As per Exhibit 1											
	Bridge						Deduct:—				1,350	78	1,053	1,600	65	1,040		
	Steel	33,740 lbs @	$0.04	Steel	40,000 lbs @	$0.04	Scrap rail				321	50	161	256	50	128		
	Bridge ties	7.349 M.B.M.	43.64	Piles	640 lin. ft.	0.40	0.92 tons @	$14.00	$13	100 $13								
	Guard rail (wooden)	.412 M.B.M.	43.64	Timber	4.5 M.B.M.	43.00	Scrap rial 1.22	14.00	17	100 17	18	50	9	194	50	97		
	Guard rail (scrap rail)	.92 tons	14.00	Timber	2.00 M.B.M.	38.00	Track spikes 1.2 cwt.	2.10	3	78 2	13	100	13	76	50	38		
	Boat spikes for wooden gd. rail	106 lbs	0.035	Iron	890 lbs	0.035	Track spikes 1.59 cwt.	2.10	3	78 2	4	78	3	31	50	16		
	Track spikes for scrap gd. rail	1.2 cwt.	2.10	Bridge ties	4.2 M.B.M.	34.00					3	78	2	143	50	71		
							Total deductions.....		36	34								

Bridge No.	Riggs—1911—Exhibit 1			Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A			1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
										$		$	$		$	$		$
	Abutments																	
	Piles	700 ft.	0.40							280	56	157						
	Timber	3.696 M.B.M.	43.64				Total as per			161	50	81						
	Wrought iron	635 lbs	0.035				Exhibit 1	2,542	1,704	22	78	17						
	Cast iron	165 lbs	0.035				Deduct	36	34	6	78	5				2,506		1,670
	Trestle Approach																	
	Piles	240 ft.	0.40							96	56	54						
	Timber	3.633 M.B.M.	43.64				Add timber	1.498 M.B.M. @	$43.64	159	50	80				65	95	62
	Wrought iron	418 lbs	0.035							15	78	12						
	Cast iron	152 lbs	0.035							5	78	4						
	Bridge ties	33	2.08¾							69	50	34						
	Guard rail (scrap rail)	1.22 tons	14.00							17	100	17						
	Track spikes for scrap rail	1.59 cwt.	2.10							3	78	2						
										2,542		1,704	2,300		1,390	2,571		1,732
237	M. P. 173.9—20′ deck plate girder on concrete abutments.			M. P. 173.9—20′ I beams on concrete abutments.			M. P. 173.9—20′ deck plate girder Concrete abutments.											
	Bridge						Bridge											
	Steel	6,770 lbs @	$0.04	Excavation	45 c. y. @	$0.50	Steel	6,770 lbs @	$0.04	271	100	271	23			271	96	260
	Bridge ties	2.548 M.B.M.	43.64	Masonry	130 c. y.	8.00	Bridge ties	2.548 M.B.M.	43.64	111	100	111	1,040			111	88	98
	Guard rail (wooden)	.480 M.B.M.	43.64	Steel	7,320 lbs	0.04	Guard rail (wooden)	0.48 M.B.M.	43.64	21	100	21	293			21	88	18
	Guard rail (scrap rail)	1.07 tons	14.00	Timber	0.16 M.B.M.	43.00	Boat spikes	88 lbs	0.035	15	100	15	7			3	92	3
	Boat spikes for wooden gd. rail	88 lbs	0.035	Iron	60 lbs	0.035	Abutments			3	100	3	2					
	Track spikes for scrap gd. rail	1.39 cwt.	2.10	Bridge ties	1.0 M.B.M.	34.00	Excavation	44.5 c. y.	0.50	3	100	3	34			22	100	22
							Concrete	128 c. y.	9.00							1,152	96	1,107

	Abutments																		
	Excavation	44.5 c. y.	0.50							22	100	22							
	Concrete	128 c. y.	9.00							1,152	100	1,152							
										1,598		1,598	1,399	95	1,329	1,580		1,508
238	M. P. 174.1—20′ deck plate girder on concrete abutments.			M. P. 174.1—20′ I beam on concrete abutments.				M. P. 174.1—20′ deck plate girder on concrete abutments.											
	Bridge							Bridge											
	Steel	6,770 lbs @	$0.04	Excavation	45 c. y. @	$0.50		Steel	6,770 lbs @	$0.04	271	100	271	23		271	96	260
	Bridge ties	2.548 M.B.M.	43.64	Masonry	130 c. y.	8.00		Bridge ties	2.548 M.B.M.	43.64	111	100	111	1,040		111	88	98
	Guard rail (wooden)	.480 M.B.M.	43.64	Steel	7,320 lbs	0.04		Guard rails	0.48 M.B.M.	43.64	21	100	21	293		21	88	18
	Guard rail (scrap rail)	1.07 tons	14.00	Timber	0.16 M.B.M.	43.00		Boat spikes	88 lbs	0.035	15	100	15	7		3	92	3
	Boat spikes for wooden gd. rail	88 lbs	0.035	Iron	60 lbs	0.035		Abutments			3	100	3	2				
	Track spikes for scrap gd. rail	1.39 cwt.	2.10	Bridge ties	1.0 M.B.M.	34.00		Excavation	44.5 c. y.	0.50	3	100	3	34		22	100	22
	Abutments							Concrete	128 c. y.	9.00						1,152	96	1,107
	Excavation	44.5 c.y.	0.50								22	100	22					
	Concrete	128 c.y.	9.00								1,152	100	1,152					
											1,598		1,598	1,399	95	1,329	1,580		1,508
239	M. P. 174.2—28′ deck plate girder on concrete abutments.			M. P. 174.2—20′ I beam on concrete abutments.				M. P. 174.1—28′ deck plate girder on concrete abutments.											
	Bridge							Bridge											
	Steel	11,812 lbs @	$0.04	Excavation	45 c. y. @	$0.50		Steel	11,812 lbs @	$0.04	472	100	472	23		472	96	453
	Bridge ties	3.519 M.B.M.	43.64	Masonry	130 c. y.	8.00		Bridge ties	3.519 M.B.M.	43.64	154	100	154	1,040		154	88	136
	Guard rail (wooden)	.560 M.B.M.	43.64	Steel	7,320 lbs	0.04		Guard rail	.560 M.B.M.	43.64	24	100	24	293		24	88	21
	Guard rail (scrap rail)	1.07 tons	14.00	Timber	0.16 M.B.M.	43.00		Boat spikes	106 lbs	0.035	15	100	15	7		4	92	3
	Boat spikes for wooden gd. rail	106 lbs.	0.035	Iron	60 lbs	0.035		Abutments			4	100	4	2				
	Track spikes for scrap gd. rail	1.39 cwt.	2.10	Bridge ties	1.0 M.B.M.	34.00		Excavation	45 c. y.	0.50	3	100	3	34		23	100	23
	Abutments							Concrete	132 c. y.	9.00						1,188	96	1,140
	Excavation	45 c. y.	0.50								23	100	12					
	Concrete	132 c. y.	9.00								1,188	100	1,188					
											1,883		1,883	1,399	95	1,329	1,865		1,776

Bridge No.	Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
					$		$	$		$	$		$
240	174.7		20' arch I beam on concrete abutment.	20' span I beams on concrete abutment.									
		See Trestle Schedule	Excavation 45 c. y. @ $0.50	Abutments Excavation 25 c. y. @ $0.50				23			13	100	13
			Masonry 130 c. y. 8.00	Concrete 31 c. y. 9.00				1,040			279	94	262
				Bridge									
			Steel 7,320 lbs 0.04	Steel 3,200 0.04				293			126	94	120
			Timber 0.16 M.B.M. 43.00	Guard rail 0.560 M.B.M. 43.64				7			24	82	20
			Iron 60 lbs 0.035	Boat spikes 100 lbs 0.035				2			4	88	3
			Bridge ties 1.0 M.B.M. 34.00	Bridge ties 2.70 M.B.M. 43.64				34			118	82	97
								1,399	95	1,329	566		515
264	187.9	Pesheke River—32' deck plate girder. Pile abutments. Trestle approaches 203'.											
		Bridge		As per Exhibit 1									
		Steel 14,832 lbs @ $0.04	Steel 15,500 lbs @ $0.04	Deduct:—	593	92	546	620					
		Bridge ties 3.696 M.B.M. 43.64	Piles 1,580 lin. ft. 0.40	Scrap rail	161	76	122	632					
		Guard rail		0.57 tons @ $14.00 $8 100 $8									
		(wooden) 0.256 M.B.M. 43.64	Timber 24.5 M.B.M. 43.00	Scrap rail	11	76	8	1,054					
		Guard rail		4.25 14.00 60 100 60									
		(scrap rail) 0.57 tons 14.00	Timber 1.70 M.B.M. 38.00	Track spikes	8	100	8	65					
		Boat spikes for		0.74 cwt. 2.10 2 2									
		guard rail 66 lbs 0.035	Iron 3,140 lbs 0.035	Track spikes	2		2	110					
		Track spikes for		5.52 cwt. 2.10 13 92 11									
		guard rail 0.74 cwt. 2.10	Bridge ties 11.8 M.B.M. 34.00		2		2	401					
		Abutments		Total deductions 82 81									
		Piles 500 ft. 0.40			200	84	168						
		Timber 3.696 M.B.M. 43.64		Total as per	161	76	122						
		Wrought iron 635 lbs 0.035		Exhibit 1 3,763 3,072	22	92	20						
		Cast iron 165 lbs 0.035		Deduct 82 81	6		6						
		Trestle Approaches									3,681		2,991
		Piles 1,560 ft. 0.40			624	84	524						
		Timber 29.543 M.B.M. 43.64		Add timber 9.500 M.B.M. @ $43.64	1,290	76	980				415	95	394
		Wrought iron 3,851 lbs 0.035			135	92	124						

		Cast iron 1,370 lbs 0.035										48	92	44									
		Bridge ties 205 2.06¾										428	76	325									
		Guard rail (scrap rail) 4.25 tons 14.00										60	100	60									
		Track spikes for guard rail 5.52 cwt. 2.10										12	92	11									
												3,763		3,072	2,882	80	2,306	4,096		3,285			
											TOTAL MARQUETTE TO NESTORIA....	36,491		32,657	29,475		25,522	37,221		33,084			
		NESTORIA TO HOUGHTON:																					
20D	9.6	28′ through plate girder on pile abutments			28′ through plate girder on concrete abutments						28′ through plate girder on concrete abutments, 4 ft. high.												
		Bridge									Abutments												
		Steel 13,717 lbs @ $0.04			Excavation 150 c. y. @ $0.50						Excavation 30 c. y. @ $0.50	549	92	505	75	90	68	15	100	15			
		Bridge ties 5.408 M.B.M. 43.64			Masonry 160 c. y. 8.00						Concrete 40 c. y. 9.00	236	76	179	1,280	90	1,152	360	88	317			
		Guard rail (wooden) 0.560 M.B.M. 43.64			Steel 20,000 lbs 0.04						Bridge Steel 13,717 lbs 0.04	24	76	18	800	80	640	549	92	505			
		Guard rail (scrap rail) 1.07 tons 14.00			Timber 0.22 M.B.M. 43.00						Guard rail 0.560 M.B.M. 43.64	15	100	15	9	80	7	24	76	18			
		Boat spikes for wd. gd. rail 124 lbs 0.035			Iron 84 lbs 0.035						Boat spikes 124 lbs 0.035	4		4	3	80	2	4		4			
		Track spikes for scrap gd. rail 1.39 cwt. 2.10			Bridge ties 1.4 M.B.M. 34.00						Bridge ties 5.408 M.B.M. 43.64	3		3	48	80	38	236	76	179			
		Abutments																					
		Piles 500 ft. 0.40										200	84	168									
		Timber 3.696 M.B.M. 43.64										161	76	122									
		Wrought iron 165 lbs 0.035										22	92	20									
		Cast iron 165 lbs 0.035										6		6									
												1,220		1,040	2,215		1,907	1,118		1,038			
21D	9.7	30′ deck plate girder. Concrete abutments 10′ high.																					
		Bridge									As per Exhibit 1												
		Steel 13,280 lbs @ $0.04			Excavation 150 c. y. @ $0.50						Deduct:—	531	90	478	75	90	68						
		Bridge ties 4.592 M.B.M. 43.64			Masonry 160 c. y. 8.00						Scrap rail	200	70	140	1,280	90	1,152						
		Guard rail (wooden) 0.560 M.B.M. 43.64			Steel 13,700 lbs 0.04						1.07 tons @ $14.00 $15 100 $15 Track spikes	24	70	17	548	75	411						
		Guard rail (scrap rail) 1.07 tons 14.00			Timber 0.24 M.B.M. 43.00						1.39 cwt. 2.10 3 3	15	100	15	10	75	8						
											Total deductions..... 18 18												

Bridge No.	Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
					$		$	$		$	$		$
		Boat spikes for wd. gd. rail 116 lbs 0.035	Iron 90 lbs 0.035		4		4	3	75	2			
		Track spikes for scrap gd. rail 1.39 cwt. 2.10	Bridge ties 1.15 M.B.M. 34.00	Total as per Exhibit 1 3,556 3,166	3		3	51	75	38			
		Abutments Excavation 158.5 c. y. 0.50		Deduct 18 18	79	100	79				3,538		3,148
		Concrete 300 c. y. 9.00			2,700	90	2,430						
					3,556		3,166	1,967		1,679	3,538		3,148
22D	9.8	37′ deck plate girder on masonry abutments.	37′ deck plate girder on masonry abutments. Wing wall.										
		Bridge Steel 19,077 lbs @ $0.04	Excavation 180 c. y. @ $0.50	As per Exhibit 1 Deduct:—	763	50	382	90					
		Bridge ties 5.376 M.B.M. 43.64	Masonry 200 c. y. 8.00	Scrap rail 1.07 tons @ $14.00 $15 100 $15	235	50	118	1,600					
		Guard rail (wooden) .720 M.B.M. 43.64	Steel 19,500 lbs 0.04	Track spikes 1.39 cwt. 2.10 3 50 2	31	50	16	780					
		Guard rail (scrap rail) 1.07 tons 14.00	Timber 0.30 M.B.M. 43.00	Total deductions..... 18 17	15	100	15	13					
		Boat spikes for wd. gd. rail 144 lbs 0.035	Iron 110 lbs 0.035		5	50	2	4					
		Track spikes for scrap gd. rail 1.39 cwt. 2.10	Bridge ties 1.85 M.B.M. 34.00	Total as per Exhibit 1 4,176 2,139	3	50	2	63					
		Abutments Excavation 167.4 c. y. 0.50		Deduct 18 17	84	100	84				4,158		2,122
		Masonry 304 c. y. 10.00			3,040	50	1,520						
					4,176		2,139	2,550	75	1,913	4,158		2,122
28D		L'Anse—67′ deck Howe truss on masonry abutments.											
		Howe Truss		As per Exhibit 1									
		Timber 21.521 M.B.M. $43.64	Excavation 250 c. y. @ $1.00	Deduct:—	939	52	488	250	80	200			
		Wrought iron 8,000 lbs .035	Masonry 650 c. y. 8.00	Scrap rail 1.61 tons @ $14.00 $23 100 $23	282	84	237	5,200	80	4,160			

| | | |

Bridge No.	Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
					C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
					$		$	$		$	$		$
94D	39.0	107′ through Howe truss. Pile abutments 20′ high, 50′ approach each end. 3 bents 20′ high.	Included under Trestles.	Total length 200′. One 100′ through plate girder with one 50′ through plate girder span at each end of same. Long span rests on four 5′—6′ tubular piers formed of ¾″ steel plate and filled with concrete, the whole resting on a cluster of piles. The end spans rest on concrete abutments. Weight of steel, 322,280 lbs.									
		Howe Truss.											
		Timber 48.100 M.B.M. @ $43.64			2,099	50	1,050						
		Wrought ir. 25,110 lbs 0.035			879	72	633						
		Cast iron 15,500 lbs 0.035		Concrete	543	72	391						
		Bridge ties 108 2.08¾		Abutments 94 c. y.	225	50	112						
		Guard rail		Piers 80 c. y.									
		(scrap rail) 1.9 tons 14.00			27	100	27						
		Track spikes 2.47 cwt. 2.10			5	72	4						
		Abutments											
		Piles 800 ft. 0.40			320	50	160						
		Timber 4.460 M.B.M. 43.64			195	50	98						
		Wrought iron 635 lbs 0.035			22	72	16						
		Cast iron 165 lbs 0.035			6	72	4						
		Approach											
		Piles 840 ft. 0.40			336	50	168						
		Timber 9.376 M.B.M. 43.64			409	50	204						
		Wrought iron 1,538 lbs 0.035			54	72	39						
		Cast iron 459 lbs 0.035			16	72	12						
		Bridge ties 102 2.08¾			213	50	106						
		Guard rail											
		(scrap rail) 2.38 tons 14.00			33	100	33						
		Track spikes for guard rail 3.09 cwt. 2.10			6	72	4						
					5,388		3,061				18,830	100	18,830

95D	40	51½′ through plate girder, pile abutments 12′ high, 32′ approaches each end, 2 bents 12′ high.																						
		Bridge								As per Exhibit 1.														
		Steel	33,740 lbs @	$0.04	Steel	40,000 lbs @	$0.04	Deduct:—						1,350	70	945	1,600	60	960				
		Bridge ties	7.349 M.B.M.	43.64	Piles	740 lin. ft.	0.40	Scrap rail						321	50	160	296	50	148				
		Guard rail (wooden)	0.412 M.B.M.	43.64	Timber	8.1 M.B.M.	43.00	Scrap rail 0.92 tons @	$14.00	13	100	13		18	50	9	348	50	174				
		Guard rail (scrap rail)	0.92 tons	14.00	Timber	1.7 M.B.M.	38.00	Scrap rail 1.76 tons	14.00	25	100	25		13	100	13	65	50	33				
		Boat spikes for wd. gd. rail	106 lbs	0.035	Iron	1,240 lbs	0.035	Track spikes 1.2 cwt.	2.10	3	70	2		4	70	3	43	50	21				
		Track spikes for scrap gd. rail	1.2 cwt.	2.10	Bridge ties	4.2 M.B.M.	34.00	Track spikes 2.29 cwt.	2.10	5	70	4		3	70	2	143	50	72				
		Abutments						Total deductions		46		44												
		Piles	700 ft.	0.40										280	50	140								
		Timber	3.696 M.B.M.	43.64				Total as per						161	50	80								
		Wrought iron	635 lbs	0.035				Exhibit 1		2,885		1,748		22	70	15								
		Cast iron	165 lbs	0.035				Deduct		46		44		6	70	4				2,839		1,704		
		Approaches																						
		Piles	400 ft.	0.40										160	50	80								
		Timber	7.678 M.B.M.	43.64				Add timber	2.995 M.B.M.	@$43.64				335	50	168				131		124		
		Wrought iron	942 lbs	0.035										33	70	23								
		Cast iron	304 lbs	0.035										11	70	8								
		Bridge ties	66	2.08¾										138	50	69								
		Guard rails (scrap)	1.76 tons	14.00										25	100	25								
		Track spikes for guard rail	2.29 cwt.	2.10										5	70	4								
														2,885		1,748	2,495		1,408	2,970		1,828		
								TOTAL NESTORIA TO HOUGHTON						29,669		18,760	25,041		17,150	43,020		34,471		
								TOTAL MARQUETTE TO NESTORIA						36,491		32,657	29,475		25,522	37,221		33,084		
								TOTAL MARQUETTE TO HOUGHTON						66,160		51,417	54,516		42,672	80,241		67,555		

Bridge No.	Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
					$		$	$		$	$		$
		NESTORIA TO STATE LINE:											
295	205.8	Included in Trestle Schedule—Trestle replaced by bridge in 1912-13.	Included in Trestle Schedule—Trestle replaced by bridge in in 1912-13.	33′ deck plate girder on timber abutments 12′ high.									
				Bridge									
				Steel 15,296 lbs @ $0.04							612	60	367
				Bridge ties 3.806 M.B.M. 43.64							166	50	83
				Guard rail .264 M.B.M. 43.64							12	50	6
				Boat spikes 60 lbs 0.035							2	70	1
				Abutments									
				Piles 500 lin. ft. 0.40							200	50	100
				Timber 3.696 M.B.M. 43.64							161	50	81
				Wrought iron 635 lbs 0.035							22	70	15
				Cast iron 165 lbs 0.035							6	70	4
308	233.2	East Branch—Ontonagon River—on west, 5 bents. 268½′ appro	Kenton—51½′ deck plate girder. Pil ach on east, 17 bents.	e abutments 25′ high. 79′ approach							1,181		657
		Bridge		As per Exhibit 1.									
		Plate gird. 34,331 lbs @ $0.04	Steel 32,000 lbs @ $0.04	Deduct:—	1,373	70	961	1,280	60	768			
		Bridge ties 5.936 M.B.M. 43.64	Piles 3,880 lin. ft. 0.40	Scrap rail	259	50	130	1,552	50	776			
		Guard rail (wooden) .412 M.B.M. 43.64	Timber 40.60 M.B.M. 43.00	0.92 tons @ $14.00 13 100 13									
		Guard rail (scrap rail) .92 tons 14.00	Timber 2.2 M.B.M. 38.00	Scrap rail 6.58 tons 14.00 92 100 92	18	50	9	1,746	50	873			
		Boat spikes for wd. gd. rail 106 lbs 0.035	Iron 4,880 lbs 0.035	Track spikes 1.2 cwt. 2.10 3 70 2	13	100	13	84	50	42			
		Track spikes for scrap gd. rail 1.2 cwt. 2.10	Bridge ties 19.9 M.B.M. 34.00	Track spikes 8.55 cwt. 2.10 18 70 13	4	70	3	171	50	86			
		Abutements		Total deductions 126 120	3	70	2	677	50	338			
		Piles 800 ft. 0.40			320	50	160						
		Timber 6.136 M.B.M. 43.64		Total as per Exhibit 1 7,774 4,321	268	50	134						
		Wrought ir. 1,014 lbs 0.035		Deduct 126 120	35	70	24						
		Cast iron 330 lbs 0.035			12	70	8				7,648		4,201
		Trestle approach											

		Piles 3,880 ft. 0.40																							
		Timber 59.946 M.B.M. 43.64									Add timber 16.263 M.B.M. @ $43.64						1,552	50	776				710	95	674
		Wrought ir. 9,087 lbs 0.035															2,616	50	1,308						
		Cast iron 4,057 lbs 0.035															318	70	223						
		Bridge ties 350 2.08¾															142	70	99						
		Guard rail 6.58 tons 14.00															731	50	366						
		Track spikes 8.55 cwt. 2.10															92	100	92						
																	18	70	13						
																	7,774		4,321	5,510		2,883	8,610		5,115
312	238.5	51½' deck plate girder, pile abut	ments, 17' high. 32' approach at each				end, 2 bents each, 14' high.																		
		Bridge					As per Exhibit 1.																		
		Plate gird. 34,331 lbs @ $0.04	Steel	32,000 lbs @	$0.04		Deduct:—										1,373	70	961	1,280	60	768			
		Bridge ties 5.936 M.B.M. 43.64	Piles	780 lin. ft.	0.40		Scrap rail										259	50	130	312	50	156			
		Guard rail					0.92 tons @	$14.00	$13	100	$13														
		(wooden) .412 M.B.M. 43.64	Timber	8.1 M.B.M.	43.00		Scrap rail										18	50	9	348	50	174			
		Guard rail					1.76 tons	14.00	25	100	25														
		(scrap rail) .92 tons 14.00	Timber	2.0 M.B.M.	38.00		Track spikes										13	100	13	76	50	38			
		Boat spikes for					1.2 cwt.	2.10	3	70	2														
		wd. gd. rail 106 lbs 0.035	Iron	1,260 lbs	0.035		Track spikes										4	70	3	44	50	22			
		Track spikes for					2.29 cwt.	2.10	5	70	4														
		scrap gd. rail 1.2 cwt. 2.10	Bridge ties	5.8 M.B.M.	34.00												3	70	2	197	50	99			
		Abutments					Total deductions		46		44														
		Piles 700 ft. 0.40															280	50	140						
		Timber 3.800 M.B.M. 43.64															166	50	83						
		Wrought iron 635 lbs 0.035					Total as per										22	70	15						
		Cast iron 165 lbs 0.035					Exhibit 1		2,851		1,737						6	70	4				2,805		1,693
		Trestle Approach					Deduct		46		44														
		Piles 400 ft. 0.40															160	50	80						
		Timber 7.678 M.B.M. 43.64															335	50	168						
		Wrought iron 942 lbs 0.035					Add timber 2.995 M.B.M. @ $43.64										33	70	23				131		124
		Cast iron 304 lbs 0.035															11	70	8						
		Bridge ties 66 2.08¾															138	50	69						
		Guard rail																							
		(scrap rail) 1.76 tons 14.00															25	100	25						
		Track spikes for																							
		guard rail 2.29 cwt. 2.10															5	70	4						
																	2,851		1,737	2,257		1,257	2,936		1,817

Bridge No.	Mile Post	Riggs—1911—Exhibit	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
					$		$	$		$	$		$
314	243	Middle Branch—Ontonagon River masonry footings, 155′ trestle ap proach, 9 bents, 96′ trestle approach,	—Deck plate girders, 2 spans 51½′,1	span 85′-9½″, 2 steel towers on 6 bents.									
		Bridge		As per Exhibit 1									
		Steel 245,220 lbs @ $0.04	Excavation 80 c. y. @ $0.50	Total as per Exhibit 1	9,809	78	7,651	40			17,048		11,690
		Bridge ties 21.280 M.B.M. 43.64	Masonry 120 c. y. 10.00	Add reinforcement, etc.	929	50	464	1,200			7,005	100	7,005
		Guard rail											
		(wooden) 1.512 M.B.M. 43.64	Steel 236,000 lbs 0.04		66	50	33	9,440					
		Guard rail											
		(scrap rail) 3.38 tons 14.00	Piles 1,350 lin. ft. 0.40		47	100	47	540					
		Boat spikes for											
		wd. gd. rail 380 lbs 0.035	Timber 1.5 M.B.M. 43.00		13	78	10	65					
		Track spikes for											
		scrap gd. rail 4.4 cwt. 2.10	Timber 92.4 M.B.M. 38.00		9	78	7	3,511					
		Abutments	Iron 4,170 lbs 0.035					146					
		Excavation 57 c. y. 0.50	Bridge ties 22.0 M.B.M. 34.00		28	100	28	748					
		Masonry 89 c. y. 10.00	Guard rail		890	78	694	101					
			(scrap rail) 8.4 ton 12.00										
		Trestle Approaches	Track spikes for					10					
			guard rail 5.1 cwt. 2.00										
		Piles 1,650 ft. 0.40			660	50	330						
		Timber 82.102 M.B.M. 43.64			3,583	50	1,792						
		Wrought ir. 8,374 lbs 0.035			293	72	211						
		Cast iron 3,017 lbs 0.035			106	72	76						
		Bridge ties 253 2.08¾			528	50	264						
		Guard rail											
		(scrap rail) 5.2 tons 14.00			73	100	73						
		Track spikes for											
		guard rail 6.76 cwt. 2.10			14	72	10						
					17,048		11,690	15,801	70	11,061	24,053		18,695
317	251.3	51½′ deck plate girder. Timber ab utments 36′ high. West approach 247′, 15 bents. East approach 2 54½′, 16 bents.		Length 376′. Steel trestle resting on concrete piers. End rests on steel bent encased in concrete and buried in the fill. West end rests on a timber abutment.									
		Bridge											
		Steel 34,330 lbs @ $0.04	Steel 32,000 lbs @ $0.04		1,373	74	1,016	1,280	65	832			
		Bridge ties 5.936 M.B.M. 43.64	Piles 2,260 lin. ft. 0.40		259	50	130	904	50	452			

		Guard rail (wooden) .412 M.B.M. 43.64			Timber 94.7 M.B.M. 43.00			Steel 384,000 lbs			18	50	9	4,072	50	2.036					
		Guard rail (scrap) .92 tons 14.00			Timber 2.2 M.B.M. 38.00			Concrete piers 210 c. y.			13	100	13	84	50	42					
		Boat spikes for wd. gd. rail 106 lbs 0.035			Iron 6,550 lbs 0.035			Casing east bent 5 c. y.			4	74	3	229	50	115					
		Track spikes for scrap gd. rail 1.2 cwt. 2.10			Bridge ties 27.7 M.B.M. 34.00						3	74	2	942	50	471					
		Abutments																				
		Piles 320 ft. 0.40									128	50	64									
		Timber 8.648 M.B.M. 43.64									377	50	188									
		Wrought iron 676 lbs 0.035									24	74	18									
		Cast iron 220 lbs 0.035									8	74	6									
		Trestle approaches																				
		Piles 3,560 ft. 0.40									1,424	50	712									
		Timber 113.267 M.B.M. 43.64									4,943	50	2,472									
		Wrgt. ir. 13,149 lbs 0.035									460	74	340									
		Cast iron 5,157 lbs 0.035									180	74	133									
		Bridge ties 504 2.08¾									1,052	50	526									
		Guard rail (scrap) 9.8 tons 14.00									137	100	137									
		Track spikes for guard rail 12.74 cwt. 2.10									27	74	20									
										TOTAL COST	10,430		5,789	7,511		3,948	18,600	100	18,600		
319		Ewen—Ontonagon River—70' through Howe truss. Pile abut- 28' high. West approach 342'— 21 bents. East approach 352'— 22 bents.			Ewen—Ontonagon River—70' through Howe truss. Pile abut- ments 28' high. West approach 25' —2 bents. East approach 352'— 22 bents.			Length 411'. Steel trestle resting on concrete piers. West end resting on a concrete abutment. East end on a steel bent encased in con- crete and buried in the fill.													
		Howe truss			Piles 1,600 lin. ft. @ $0.40			Weight of steel 362,500 lbs.						640	60	384					
		Timber 26.523 M.B.M. 43.64			Timber 39.2 M.B.M. 44.00			Concrete			1,157	50	578	1,725	40	690					
		Wrought ir. 9,260 lbs 0.035			Timber 89.9 M.B.M. 38.00			Abutment	15 c. y.		324	82	266	3,416	60	2,050					
		Cast iron 8,260 lbs .035			Iron 31,990 lbs 0.035			Piers	165 c. y.		289	82	237	1,120	60	672					
		Bridge ties 71 2.08¾			Bridge ties 22.4 M.B.M. 34.00			Casing	5 c. y.		148	50	74	761	60	457					
		Guard rail (scrap) 1.3 tons 14.00									18	100	18									
		Track spikes for guard rail 1.64 cwt. 2.10									3	82	2									

Bridge No.	Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
					$		$	$		$	$		$
		Abutments											
		Piles 900 ft. 0.40			360	64	230						
		Timber 6.136 M.B.M. 43.64			268	50	134						
		Wrought ir. 1,014 lbs 0.035			35	82	29						
		Cast iron 330 lbs 0.035			12	82	10						
		Trestle approaches											
		Piles 5,920 ft. 0.40			2,368	54	1,279						
		Timber 96.149M B.M. 43.64			4,196	50	2,098						
		Wrgt. ir. 14,937 lbs 0.035			523	77	403						
		Cast iron 6,242 lbs 0.035			218	77	168						
		Bridge ties 696 2.08¾			1,453	50	726						
		Guard rail (scrap) 13.22 tons 14.00			185	100	185						
		Track spikes for guard rail 17.19 cwt. 2.10			36	77	28						
				Total Cost	11,593		6,465	7,662		4,253	18,300		18,300
332	280.2	Presque Isle River—124′ through approach, 5 bents.	lattice span. Pile abutments 15′ high.	63′ west approach, 4 bents. 79′ east									
		Bridge	Floor system re-inforced with four 12″ I beams.	As per Exhibit 1									
		Steel 102,000 lbs @ $0.045	Steel 145,000 lbs @ $0.04	Deduct:—	4,590	74	3,397	5,800	60	3,480			
		Bridge ties 21.12 M.B.M. 43.64	Piles 1,400 lin. ft. 0.40	Scrap rail 2.21 tons @ $14.00 $31 100 $31	922	50	461	560	50	280			
		Guard rail (wooden) 3.48 M.B.M. 43.64	Timber 17.7 M.B.M. 43.00	Scrap rail 3.14 tons 14.00 44 100 44	152	50	76	761	50	381			
		Guard rail (scrap) 2.21 tons 14.00	Timber 3.0 M.B.M. 38.00	Track spikes 2.87 cwt. 2.10 6 74 4	31	100	31	114	50	57			
		Bolts and washers for wood. gd. 1,926 lbs 0.035	Iron 2,570 lbs 0.035	Track spikes 4.08 cwt. 2.10 9 74 7	67	74	50	90	50	45			
		Track washers for for scrap guard 2.87 cwt. 2.10	Bridge ties 13.3 M.B.M. 34.00	Total deductions 90 86	6	74	4	452	50	226			

| | | |

Bridge No.	Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
					$		$	$		$	$		$
		Guard rail (scrap) 7.77 tons 14.00		Add timber 18.205 M.B.M. @ $43.64	109	100	109				794	95	754
		Track spikes for guard rail 10.10 cwt. 2.10			21	74	16						
					14,206		7,651	13,968	50	6,984	14,839		8,250
338	289.9	Black River—51½′ deck plate girder, timber abutments, 32′ high, 256′ approach, 7 bents.		West approach, 16 bents, 112′ east									
		Bridge		As per Exhibit 1									
		Steel 34,330 lbs @ $0.04	Steel 32,000 lbs @ $0.04	Deduct:—	1,373	78	1,071	1,280	65	832			
		Bridge ties 5.936 M.B.M. 43.64	Piles 3,150 lin. ft. 0.40	Scrap rail	259	50	130	1,260	50	630			
		Guard rail (wooden) 0.412 M.B.M. 43.64	Timber 0.4 M.B.M. 43.00	0.92 tons @ $14.00 $13 100 $13 Scrap rail	18	50	9	17	50	9			
		Guard rail (scrap) 0.92 tons 14.00	Timber 139.0 M.B.M. 38.00	7.12 tons 14.00 100 100 100 Track spikes	13	100	13	5,282	50	2,641			
		Boat spikes for wd. gd. rail 106 lbs 0.035	Iron 7,200 lbs 0.035	1.2 cwt. 2.10 3 78 2 Track spikes	4	78	3	252	50	126			
		Track spikes for scrap gd. rail 1.2 cwt. 2.10	Bridge ties 21.0 M.B.M. 34.00	9.26 cwt. 2.10 19 74 14 Total deductions.	3	78	2	714	50	357			
		Abutments			135		129						
		Piles 300 ft. 0.40			120	56	67						
		Timber 12.470 M.B.M. 43.64			544	50	272						
		Wrgt. iron 1,036 lbs 0.035		Total as per	36	78	28						
		Cast iron 260 lbs 0.035		Exhibit 1 10,700 5,960	9	78	7						
		Trestle Approaches		Deduct 135 129							10,565		5,831
		Piles 1,760 ft. 0.40			704	50	352						
		Timber 140.460 M.B.M. 43.64			6,130	50	3,065						
		Wrgt. iron 12,544 lbs 0.035			439	74	325						
		Cast iron 4,472 lbs 0.035			157	74	116						
		Bridge ties 370 2.08¾			772	50	386						
		Guard rail (scrap) 7.12 tons 14.00		Add timber 17.222 M.B.M. @ $43.64	100	100	100				752	95	714

		Track spikes for gd. rail 9.26 cwt. 2.10									19	74	14										
											10,700		5,960	8,805		4,595	11,317		6,545
340	292.4	Black River—51½′ through plate girder. Pile abutments 10′ high, 44′ approach west, 3 bents, 94′ approach east, 6 bents.																					
		Bridge								As per Exhibit 1													
		Steel 33,740 lbs @ $0.04			Steel	40,000 lbs @	$0.04			Deduct: —	1,350	74	999	1,600	65	1,040							
		Bridge ties 7.349 M.B.M.	43.64		Piles	780 lin. ft.	0.40			Scrap rail	321	50	160	312	50	156							
		Guard rail								0.92 tons @ $14.00 $13 100 $13													
		(wooden) 0.412 M.B.M.	43.64		Timber	16.8 M.B.M.	43.00			Scrap rail	18	50	9	722	50	361							
		Guard rail								2.83 tons 14.00 40 100 40													
		(scrap) 0.92 tons	14.00		Timber	1.9 M.B.M.	38.00			Track spikes	13	100	13	72	50	36							
		Boat spikes for								1.2 cwt. 2.10 3 74 2													
		wd. gd. rail 106 lbs	0.035		Iron	2,260 lbs	0.035			Track spikes	4	74	3	79	50	40							
		Track spikes for								3.68 cwt. 2.10 8 74 6													
		scrap gd. rail 1.2 cwt.	2.10		Bridge ties	9.5 M.B.M.	34.00				3	74	2	323	50	161							
		Abutments								Total deductions..... 64 61													
		Piles 500 ft.	0.40								200	50	100										
		Timber 3.696 M.B.M.	43.64								161	50	80										
		Wrought iron 635 lbs	0.035							Total as per	22	74	16										
		Cast iron 165 lbs	0.035							Exhibit 1 3,565 2,165	6	74	4										
		Trestle Approaches								Deduct 64 61													
		Piles 1,000 ft.	0.40								400	50	200						3,501		2,104
		Timber 14.330 M.B.M.	43.64								625	50	312										
		Wrought iron 2,168 lbs	0.035								76	74	56										
		Cast iron 734 lbs	0.035								26	74	19										
		Bridge ties 140	2.08⅓								292	50	146										
		Guard rail								Add timber 6.458 M.B.M. @ $43.64									283	95	269		
		(scrap) 2.83 tons	14.00								40	100	40										
		Track spikes for																					
		guard rail 3.68 cwt.	2.10								8	74	6										
											3,565		2,165	3,108		1,794	3,784		2,373
348	302.4	Montreal River—51½′ through plate girder. Pile abutments 7′ high. Half of girder each side of State line. 32′ approach in Mich., 2 bents 7′ high. 95′ approach in Wisconsin, 6 bents 7′ high.																					
		Bridge								As per Exhibit 1													
		Steel 33,740 lbs @ $0.04			Steel	40,000 lbs @	$0.04			Deduct	675	74	500	1,600	65	1,040							
		Bridge ties 7.349 M.B.M.	43.64		Piles	180 lin. ft.	0.40			Scrap rail	160	50	80	72	50	36							

Bridge No.	Riggs—1911—Exhibit 1	Hansel-1912-Exhibit 15	Riggs—1913—Exhibit 1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
	Guard rail (wooden) 0.412 M.B.M. 43.64	Timber 0.4 M.B.M. 43.00	0.92 tons @ $14.00 $ 6 100 $ 6 Scrap rail	9	50	4	17	50	8			
	Guard rail (scrap) 0.92 tons 14.00	Timber 1.7 M.B.M. 38.00	1.15 ton 14.00 16 100 16 Track spikes	6	100	6	65	50	33			
	Boat spikes for wd. gd. rail 106 lbs 0.035	Iron 410 lbs 0.035	1.2 cwt. 2.10 1 1 Track spikes	2	74	1	14	50	7			
	Track spikes for scrap gd. rail 1.2 cwt. 2.10	Bridge ties 2.6 M.B.M. 34.00	1.5 cwt. 2.10 3 74 2	1		1	88	50	44			
			Total deductions..... 26 25									
			Total as per Exhibit 1 1,401 885				(1,856)		(1,168)			
	Abutments											
	Piles 500 ft. 0.40	One-half value in Michigan	Deduct 26 25	100	50	50	928		584			
	Timber 3.696 M.B.M. 43.64			81	50	40				1,375		660
	Wrought iron 635 lbs 0.035	Piles 120 lin. ft. 0.40	Add Timber 5.994 M.B.M. @ $43.64	11	74	8	48			259	95	246
	Cast iron 165 lbs 0.035	Timber 4.05 M.B.M. 43.00		3	74	2	174					
	Trestle Approach in Michigan	Iron 430 lbs 0.035					15					
	Piles 200 ft. 0.40	Bridge ties 1.6 M.B.M. 34.00		80	50	40	54					
	Timber 3.417 M.B.M. 43.64			149	50	74	291	50	146			
	Wrought ir. 799.6 lbs 0.035			28	74	21						
	Cast iron 224 lbs 0.035			8	74	6						
	Bridge ties 33 2.08¾			69	50	34						
	Guard rail (scrap) 1.15 tons 14.00			16	100	16						
	Track spikes for guard rail 1.50 cwt. 2.10			3	74	2						
				1,401		885	2,417		1,314	1,634		1,106
			TOTAL NESTORIA TO STATE LINE	87,290		51,663	73,618		42,558	113,176		86,648

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS

Schedule No. 5
TRESTLES

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A				1911			1912			1913		
										C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
										$		$	$		$	$		$
				EAST OF MARQUETTE S. S. MARIE TO MARQUETTE:														
32.4	8	80	6	Piling 720 lin. ft. @ $0.40 Timber 9.91 M.B.M. 43.64 Wrought iron 1,475 lbs Cast iron 3.32 lbs Total —— iron 1,807 lbs 0.035 Bridge ties (3.89 M.B.M.) 81 2.0675 Guard rail 2.1432 tons 14.00 Guard rail spikes 2.51 cwt. 2.10	Piling 660 lin. ft. @ $0.40 Timber 10.46 M.B.M. 43.00 Iron 1,200 lbs 0.035 Bridge ties 4.00 M.B.M. 34.00	As per Exhibit 1 Deduct:— Scrap rail 2.143 tons @ $14.00 Track spikes 2.51 cwt. 2.10	30 5 35 988 35	100 76	30 4 34 533 34	288 432 64 169 30 5	52 50 76 50 100 76	150 216 49 84 30 4	264 450 42 136			953		499
						Add timber 3.744 M.B.M. 43.64										163	95	155
										988		533	892	50	446	1,116		654
33.3	9	112	8	Piling 1,120 lin. ft. @ $0.40 Timber 13.86 M.B.M. 43.64 Wrought iron 2,004 lbs Cast iron 674 lbs Total —— iron 2,678 lbs 0.035	Piling 1,200 lin. ft. 0.40 Timber 14.11 M.B.M. 43.00 Iron 1,700 lbs 0.035	As per Exhibit 1 Deduct:— Scrap rail 2.679 tons @ $14.00 Track spikes 3.23 cwt. 2.10	38 7 45	100 76	38 5 43	448 605 94	52 50 76	223 302 71	480 607 60					

				Bridge ties (5.42 M.B.M.) 113 2.0875 Guard rail 2.6790 tons 14.00 Guard rail spikes 3.23 cwt. 2.10		Bridge ties 5.60 M.B.M. 34.00		Total as per Exhibit 1	1,428		767	236	50	118	190						
								Deduct	45		43	38	100	38				1,383		724
								Add timber 5.242 M.B.M. 43.64				7	76	5				229		218
												1,428		767	1,337	50	669	1,612		942
38	14	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 308 lbs Cast iron 68 lbs Total —— iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875		Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00 Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00		Total as per Exhibit 1 Add timber 0.749 M.B.M. @ $43.64				53	60	32	48			221		121
												120	50	60	136			33	95	31
												13	80	11	14					
												35	50	18	27					
												221		121	225	50	113	254		152
39.2	19	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 308 lbs Cast iron 68 lbs Total —— iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875		Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00 Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00		Total as per Exhibit 1 Add timber 0.749 M.B.M. @ $43.64				53	60	32	48			221		121
												120	50	60	136			33	95	31
												13	80	11	14					
												35	50	18	27					
												221		121	225	60	135	254		152
39.8	20	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64		Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00		Total as per Exhibit 1 Add timber 0.749 M.B.M. @ $43.64				53	60	32	48			221		121
												120	50	60	136			33	95	31

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A				1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
										$		$	$		$	$		$
				Wrought iron 308 lbs $	$													
				Cast ir. 68 lbs														
				Total iron 376 lbs 0.035	Iron 400 lbs 0.035					13	80	11	14					
				Bridge ties (0.82 M.B.M.) 17 2.0875	Bridge ties 0.80 M.B.M. 34.00					35	50	18	27					
										221		121	225	60	135	254		152
44.0	22	222	15	Piling 1,500 lin. ft. @ $0.40	Piling 900 lin. ft. @ $0.40	As per Exhibit 1				600	64	384	360					
				Timber	Timber	Deduct:												
						Scrap rail												
				32.86 M.B.M. 43.64	26.73 M.B.M. 43.00	4.822 tons @ $14.00	68	100	68	1,434	50	717	1,150					
				Wrought iron 5,122 lbs		Track spikes 5.92 cwt. 2.10	12		10									
				Cast iron 1,434 lbs			80		78									
				Total iron 6,556 lbs 0.035	Iron 3,000 lbs 0.035					229	82	188	105					
				Bridge ties (10.70 M.B.M.) 223 2.0875	Bridge ties 11.10 M.B.M. 34.00	Total as per Exhibit 1	2,809		1,600	466	50	233	377					
				Guard rail 4.8222 tons 14.00		Deduct	80		78	68	100	68				2,729		1,522
				Guard rail spikes 5.92 cwt. 2.10		Add timber 10.39 M.B.M. 43.64				12	82	10				453	95	430
										2,809		1,600	1,992	60	1,195	3,182		1,952
44.0	22½	48	4	Piling 400 lin. ft. @ 0.40	Piling 400 lin. ft. @ $0.40	Total as per Exhibit 1				160	64	102	160			567		318
				Timber	Timber	Add timber												
				6.13 M.B.M. 43.64	6.81 M.B.M. 43.00	2.246 M.B.M. @ $43.64				268	50	134	293			98	95	93

				Wrought iron 820 lbs Cast ir. 235 lbs Total —— iron 1,055 lbs 0.035 Bridge ties (2.35 M.B.M.) 49 2.0875		Iron 800 lbs 0.035 Bridge ties 2.40 M.B.M. 34.00					37	82	31	28							
											102	50	51	82							
											567		318	563	60	338	665		411		
45.4	23	48	4	Piling 480 lin. ft. @ $0.40 Timber 6.61 M.B.M. 43.64 Wrought iron 983 lbs Cast ir. 315 lbs Total —— iron 1,298 lbs 0.035 Bridge ties (2.35 M.B.M.) 49 2.0875		Piling 420 lin. ft. @ $0.40 Timber 6.81 M.B.M. 43.00 Iron 860 lbs 0.035 Bridge ties 2.40 M.B.M. 34.00		Total as per Exhibit 1 Add timber 2.246 M.B.M. @ $43.64			192	52	100	168			627		329		
											288	50	144	293			98	95	93		
											45	76	34	28							
											102	50	51	82							
											627		329	571	50	286	725		422		
46.5	24	48	4	Piling 400 lin. ft. @ $0.40 Timber 6.13 M.B.M. 43.64 Wrought iron 820 lbs Cast ir. 235 lbs Total —— iron 1,055 lbs 0.035 Bridge ties (2.35 M.B.M.) 49 2.0875		Piling 240 lin. ft. @ $0.40 Timber 6.81 M.B.M. 43.00 Iron 800 lbs 0.035 Bridge ties 2.40 M.B.M. 34.00		Total as per Exhibit 1 Add timber 2.246 M.B.M. @ $43.64			160	56	90	96			567		304		
											268	50	134	293			98	95	93		
											37	78	29	28							
											102	50	51	82							
											567		304	499	50	250	665		397		
56.7	39	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 308 lbs		Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00		Total as per Exhibit 1 Add timber 0.749 M.B.M. 43.64			53	50	26	48			221		113		
											120	50	60	136			33	95	31		

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A				1911			1912			1913		
										C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				$	$					$		$	$		$	$		$
				Cast ir. 68 lbs Total —— iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875	Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00					13 35	72 50	9 18	14 27					
										221		113	225	50	113	254		144
64	57	145	10	Piling 1,000 lin. ft. @ $0.40 Timber 16.64 M.B.M. 43.64 Wrought iron 2,139 lbs Cast iron 654 lbs Total —— iron 2,793 lbs 0.035 Bridge ties (7.01 M.B.M.) 146 2.0875 Guard rail 3.2148 tons 14.00 Guard rail spikes 3.94 cwt. 2.10	Piling 900 lin. ft. @ $0.40 Timber 17.84 M.B.M. 43.00 Iron 2,000 lbs 0.035 Bridge ties 7.25 M.B.M. 34.00	As per Exhibit 1 Deduct:— Scrap rail 3.215 tons @ $14.00 Track spikes 3.94 cwt. 2.10 Total as per Exhibit 1 Deduct Add timber 6.786 M.B.M. 43.64	45 8 53 1,582 53	100 76	45 6 51 848 51	400 726 98 305 45 8	52 50 76 50 100 76	208 363 74 152 45 6	360 768 70 247			1,529		797 296	95	281
										1,582		848	1,445	50	723	1,825		1,078
65.7	59	64	5	Piling 500 lin. ft. @ $0.40 Timber 7.83 M.B.M. 43.64 Wrought iron 999 lbs	Piling 300 lin. ft. @ $0.40 Timber 7.83 M.B.M. 43.00	Piling 500 lin. ft. @ $0.40 Timber 7.83 M.B.M. 43.64 Wrought iron 999 lbs				200 342	50 50	100 171	120 371			200 342	75 75	150 256

				Cast ir. 289 lbs Total —— iron 1,288 lbs 0.035 Bridge ties (3.12 M.B.M.) 65 2.0875 Guard rail 1.6074 tons 14.00 Guard rail spikes 1.93 cwt. 2.10		Iron 1,000 lbs 0.035 Bridge ties 3.20 M.B.M. 34.00		Cast ir. 289 lbs Total —— iron 1,288 lbs 0.035 Bridge ties (3.12 M.B.M.) 65 2.0875			45 136 23 4 750	62 50 100 62	28 68 23 2 392	35 109 635	40	254	45 138 723	62 50	28 68 502
66.0	60	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 308 lbs Cast ir. 68 lbs Total —— iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875		Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00 Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00		Total as per Exhibit 1 Add timber 0.749 M.B.M. 43.64			53 120 13 35 221	52 50 76 50	28 60 10 18 116	48 136 14 27 225	50	113	221 33 254	95	116 31 147
67.6	63	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M. B. M. 43.64 Wrought iron 308 lbs Cast ir. 68 lbs Total 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875		Piling 120 lin. ft. @ $ 0.40 Timber 3.16 M. B. M. 43.00 Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00		FILLED. See Cu.lvertSchedule.			53 120 13 35 221	50 50 70 50	26 60 9 18 113	48 136 14 27 225	50	113					
68	64	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64		Piling 120 lin. ft. @ 0.40 Timber 3.16 M.B.M. 43.00		FILLED. See Culvert Schedule.			53 120	50 50	26 60	48 136								

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
							C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				Wrought iron 308 lbs $	$		$		$	$		$	$		$
				Cast ir. 68 lbs											
				Total ——											
				iron 376 lbs 0.035	Iron 400 lbs 0.035		13	70	9	14					
				Bridge ties (0.82 M.B.M.)	Bridge ties										
				17 2.0875	0.80 M.B.M. 34.00		35	50	18	27					
							221		113	225	50	113			
68.4	65	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	FILLED. See Culvert Schedule.	53	50	26	48					
				Timber	Timber										
				2.75 M.B.M. 43.64	3.16 M.B.M. 43.00		120	50	60	136					
				Wrought iron 308 lbs											
				Cast ir. 68 lbs											
				Total ——											
				iron 376 lbs 0.035	Iron 400 lbs 0.035		13	70	9	14					
				Bridge ties (0.82 M.B.M.)	Bridge ties										
				17 2.0875	0.80 M.B.M. 34.00		35	50	18	27					
							221		113	225	50	113			
69.9	68	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1	53	52	28	48			221		116
				Timber	Timber	Add timber									
				2.75 M.B.M. 43.64	3.16 M.B.M. 43.00	0.749 M. B. M. @ $43.64	120	50	60	136			33	95	31
				Wrought iron 308 lbs											
				Cast ir. 68 lbs											
				Total ——											
				iron 376 lbs 0.035	Iron 400 lbs 0.035		13	76	10	14					
				Bridge ties (0.82 M.B.M.)	Bridge ties										
				17 2.0875	0.80 M.B.M. 34.00		35	50	18	27					
							221		116	225	50	113	254		147

70.4	71	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1				53	52	28	48				221	116
				Timber	Timber	Add timber												
				2.75 M.B.M. 43.64	3.16 M.B.M. 43.00	0.749 M.B.M. @ $43.64				120	50	60	136			33	95	31
				Wrought iron														
				308 lbs														
				Cast ir. 68 lbs														
				Total ——														
				iron 376 lbs 0.035	Iron 400 lbs 0.035					13	76	10	14					
				Bridge ties (0.82 M.B.M.)	Bridge ties													
				17 2.0875	0.80 M.B.M. 34.00					35	50	18	27					
										221		116	225	50	113	254		147
70.5	72	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ 0.40	Total as per Exhibit 1				53	52	28	48			221		116
				Timber	Timber	Add timber												
				2.75 M.B.M. 43.64	3.16 M.B.M. 43.00	0.749 M.B.M. @ $43.64				120	50	60	136			33	95	31
				Wrought iron														
				308 lbs														
				Cast ir. 68 lbs														
				Total ——														
				iron 376 lbs 0.035	Iron 400 lbs 0.035					13	76	10	14					
				Bridge ties (0.82 M.B.M.)	Bridge ties													
				17 2.0875	0.80 M.B.M. 34.00					35	50	18	27					
										221		116	225	50	113	254		147
70.7	73	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1				53	50	26	48			221		113
				Timber	Timber	Add timber												
				2.75 M.B.M. 43.64	3.16 M.B.M. 43.00	0.749 M.B.M. @ $43.64				120	50	60	136			33	95	31
				Wrought iron														
				308 lbs														
				Cast ir. 68 lbs														
				Total ——														
				iron 376 lbs 0.035	Iron 400 lbs 0.035					13	70	9	14					
				Bridge ties (0.82 M.B.M.)	Bridge ties													
				17 2.0875	0.80 M.B.M. 34.00					35	50	18	27					
										221		113	225	50	113	254		144
71.4	76	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1				53	50	26	48			221		113
				Timber	Timber	Add timber												
				2.75 M.B.M. 43.64	3.16 M.B.M. 43.00	0.749 M.B.M. @ $43.64				120	50	60	136			33	95	31

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
							C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				Wrought iron $	$		$		$	$		$	$		$
				308 lbs											
				Cast ir. 68 lbs											
				Total ——											
				iron 376 lbs 0.035	Iron 400 lbs 0.035		13	70	9	14					
				Bridge-ties (0.82 M.B.M.)	Bridge ties										
				17 2.0875	0.80 M.B.M. 34.00		35	50	18	27					
							221		113	225	50	113	254		144
79.7	92	16	2	Piling 160 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1	64	68	44	48			232		135
				Timber	Timber	Add timber									
				2.75 M.B.M. 43.64	3.16 M.B.M. 43.00	1.037 M.B.M. @ $43.64	120	52	62	136			45	95	43
				Wrought iron											
				308 lbs											
				Cast ir. 68 lbs											
				Total ——											
				iron 376 lbs 0.035	Iron 400 lbs 0.035		13	84	11	14					
				Bridge ties (0.82 M.B.M.)	Bridge ties										
				17 2.0875	0.80 M.B.M. 34.00		35	52	18	27					
							232		135	225	60	135	277		178
81.0	97	6	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1	53	50	26	48			221		112
				Timber	Timber	Add timber									
				2.75 M.B.M. 43.64	3.16 M.B.M. 43.00	0.749 M.B.M. @ $43.64	120	50	60	136			33	95	31
				Wrought iron											
				308 lbs											
				Cast ir. 68 lbs											
				Total ——											
				iron 376 lbs 0.035	Iron 400 lbs 0.035		13	62	8	14					
				Bridge ties (0.82 M.B.M.)	Bridge ties										
				17 2.0875	0.80 M.B.M. 34.00		35	50	18	27					
							221		112	225	50	113	254		143

| | | |

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
							C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
							$		$	$		$	$		$
				Timber 2.75 M.B.M. 43.64	Timber 3.16 M.B.M. 43.00	Add timber 0.749 M.B.M. @ $43.64	120	50	60	136			33	95	31
				Wrought iron 308 lbs Cast ir. 68 lbs Total iron 376 lbs 0.035	Iron 400 lbs 0.035		13	76	10	14					
				Bridge ties (0.82 M.B.M.) 17 2.0875	Bridge ties 0.80 M.B.M. 34.00		35	50	18	27					
							221		116	225	50	113	254		147
83.2	102	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1	53	50	26	48				221	113
				Timber 2.75 M.B.M. 43.64	Timber 3.16 M.B.M. 43.00	Add timber 0.749 M. B.M. @ $43.64	120	50	60	136			33	95	31
				Wrought iron 308 lbs Cast ir. 68 lbs Total iron 376 lbs 0.035	Iron 400 lbs 0.035		13	70	9	14					
				Bridge ties (0.82 M.B.M.) 17 2.0875	Bridge ties 0.80 M.B.M. 34.00		35	50	18	27					
							221		113	225	50	113	254		144
83.4	103	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1	53	50	26	48			221		113
				Timber 2.75 M.B.M. 43.64	Timber 3.16 M.B.M. 43.00	Add timber 0.749 M.B.M. 43.64	120	50	60	136			33	95	31
				Wrought iron 308 lbs Cast ir. 68 lbs Total iron 376 lbs 0.035	Iron 400 lbs 0.035		13	72	9	14					

				Bridge ties (0.82 M.B.M.) 17 2.0875		Bridge ties 0.80 M.B. M. 34.00							35	50	18	27						
													221		113	225	50	113	254		144	
83.8	104	16	2	Piling 132 lin. ft. @ $0.40		Piling 120 lin. ft. @ $0.40		Total as per Exhibit 1					53	50	26	48			221		113	
				Timber 2.75 M.B.M. 43.64		Timber 3.16 M.B.M. 43.00		Add timber 0.749 M.B.M. @ $43.64					120	50	60	136			33	95	31	
				Wrought iron 308 lbs																		
				Cast ir. 68 lbs																		
				Total ——																		
				iron 376 lbs	0.035	Iron 400 lbs	0.035						13	72	9	14						
				Bridge ties (0.82 M.B.M.)		Bridge ties																
				17	2.0875	0.80 M.B.M.	34.00						35	50	18	27						
													221		113	225	50	113	254		144	
83.9	105	16	2	Piling 132 lin. ft. @ 0.40		Piling 120 lin. ft. @ $0.40		Total as per Exhibit 1					53	50	26	48			221		113	
				Timber 2.75 M.B.M. 43.64		Timber 3.16 M.B.M. 43.00		Add timber 0.749 M.B.M. 43.64					120	50	60	136			33	95	31	
				Wrought iron 308 lbs																		
				Cast ir. 68 lbs																		
				Total ——																		
				iron 376 lbs	0.035	Iron 400 lbs	0.035						13	70	9	14						
				Bridge ties (0.82 M.B.M.)		Bridge ties																
				17	2.0875	0.80 M.B.M.	34.00						35	50	18	27						
													221		113	225	50	113	254		144	
84.1	106	16	2	Piling 132 lin. ft. @ $0.40		Piling 120 lin. ft. @ 0.40		Total as per Exhibit 1					53	50	26	48			221		113	
				Timber 2.75 M.B.M. 43.64		Timber 3.16 M.B.M. 43.00		Add timber 0.749 M.B.M. 43.64					120	50	60	136			33	95	31	
				Wrought iron 308 lbs																		
				Cast ir. 68 lbs																		
				Total ——																		
				iron 376 lbs	0.035	Iron 400 lbs	0.035						13	70	9	14						

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
							C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
							$		$	$		$	$		$
				Bridge ties (0.82 M.B.M.) 17 2.0875	Bridge ties 0.80 M.B.M. 34.00		35	50	18	27					
							221		113	225	50	113	254		144
84.4	107	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 308 lbs Cast ir. 68 lbs Total —— iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875	Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00 Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00	Total as per Exhibit 1 Add timber 0.749 M.B.M. @ $43.64	53 120 13 35	50 50 70 50	26 60 9 18	48 136 14 27			221 33	95	113 31
							221		113	225	50	113	254		144
84.6	108	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 308 lbs Cast ir. 68 lbs Total —— iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875	Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00 Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00	Total as per Exhibit 1 Add timber 0.749 M.B.M. @ $43.64	53 120 13 35	50 50 70 50	26 60 9 18	48 136 14 27			221 33	95	113 31
							221		113	225	50	113	254		144
84.8	109	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1	53	50	26	48			221		113

				Timber			Timber			Add timber				120	50	60	136			33	95	31
				2.75 M.B.M.		43.64	3.16 M.B.M.		43.00	0.749 M.B.M. @ $43.64												
				Wrought iron																		
				308 lbs																		
				Cast ir. 68 lbs																		
				Total ——																		
				iron 376 lbs		0.035	Iron 400 lbs		0.035					13	70	9	14					
				Bridge ties (0.82 M.B.M.)			Bridge ties															
				17		2.0875	0.80 M.B.M.		34.00					35	50	18	27					
														221		113	225	50	113	254		144
	110	16	2	Piling 132 lin. ft. @		$0.40	Piling 120 lin. ft. @		$0.40	Total as per Exhibit 1				53	50	26	48			221		113
				Timber			Timber			Add Timber												
				2.75 M.B.M.		43.64	3.16 M.B.M.		43.00	0.749 M.B.M. @ $43.64				120	50	60	136			33	95	31
				Wrought iron																		
				308 lbs																		
				Cast ir. 68 lbs																		
				Total ——																		
				iron 376 lbs		0.035	Iron 400 lbs		0.035					13	70	9	14					
				Bridge ties (0.82 M.B.M.)			Bridge ties															
				17		2.0875	0.80 M.B.M.		34.00					35	50	18	27					
														221		113	225	50	113	254		144
85.4	111	31	3	Piling 300 lin. ft. @		$0.40	Piling 180 lin. ft. @		$0.40	Total as per Exhibit 1				120	50	60	72			379		193
				Timber			Timber			Add timber												
				3.85 M.B.M.		43.64	4.90 M.B.M.		43.00	1.451 M.B.M. @ $43.64				168	50	84	211			63	95	60
				Wrought iron																		
				551 lbs																		
				Cast ir. 147 lbs																		
				Total ——																		
				iron 698 lbs		0.035	Iron 600 lbs		0.035					24	64	15	21					
				Bridge ties (1.54 M.B.M.)			Bridge ties															
				32		2.0875	1.55 M.B.M.		34.00					67	50	34	53					
														379		193	357	50	179	442		253
85.7	112	16	2	Piling 160 lin. ft. @		$0.40	Piling 120 lin. ft. @		$0.40	Filled. See Culvert Schedule.				64	68	44	48					
				Timber			Timber															
				2.75 M.B.M.		43.64	3.16 M.B.M.		43.00					120	52	62	136					

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
							C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
							$		$	$		$	$		$
				Wrought iron 308 lbs Cast ir. 68 lbs Total ——											
				iron 376 lbs 0.035	Iron 400 lbs 0.035		13	84	11	14					
				Bridge ties (0.82 M.B.M.) 17 2.0875	Bridge ties 0.80 M.B.M. 34.00		35	52	18	27					
							232		135	225	60	135			
86.3	113	16	2	Piling 160 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1	64	50	32	48			232		118
				Timber 2.75 M.B.M. 43.64	Timber 3.16 M.B.M. 43.00	Add timber 0.749 M.B.M. 43.64	120	50	60	136			33	95	31
				Wrought iron 308 lbs Cast ir. 68 lbs Total ——											
				iron 376 lbs 0.035	Iron 400 lbs 0.035		13	62	8	14					
				Bridge ties (0.82 M.B.M.) 17 2.0875	Bridge ties 0.80 M.B.M. 34.00		35	50	18	27					
							232		118	225	50	113	265		149
87.0	115	16	2	Piling 160 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1	64	50	32	48			232		119
				Timber 2.75 M.B.M. 43.64	Timber 3.16 M.B.M. 43.00	Add timber 0.749 M.B.M. @ $43.64	120	50	60	136			33	95	31
				Wrought iron 308 lbs Cast ir. 68 lbs Total ——											
				iron 376 lbs 0.035	Iron 400 lbs 0.035		13	70	9	14					
				Bridge ties(0.82 M.B.M.) 17 2.0875	Bridge ties 0.80 M.B.M. 34.00		35	50	18	27					
							232		119	225	50	113	265		150

87.4	116	16	2	Piling 160 lin. ft. @ $0.40 Timber 2.75 M. B.M. 43.64 Wrought iron 308 lbs Cast ir. 68 lbs Total — iron 376 lbs 0.035 Bridge ties (0.82M.B.M.) 17 2.0875	Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00 Iron 400 lbs 0.035 Bridge ties 0.80 M.B .M. 34.00	Total as per Exhibit 1 Add timber 0.749 M.B.M. 43.64				64	50	32	48			232		119
														120	50	60	136			33	95	31
														13	72	9	14					
														35	50	18	27					
														232		119	225	50	113	265		150
87.8	117	16	2	Piling 160 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 308 lbs Cast ir. 68 lbs Total — iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875	Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00 Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00	FILLED. See Culvert Schedule.				64	50	32	48					
														120	50	50	136					
														13	70	9	14					
														35	50	18	27					
														232		119	225	50	113			
88.0	118	103	8	Piling 1,040 lin. ft. @ $0.40 Timber 11.95 M.B.M. 43.64 Wrought iron 1,890 lbs Cast iron 583 lbs Total — iron 2,473 lbs 0.035 Bridge ties (4.99 M.B.M.) 104 2.0875	Piling 480 lin. ft. @ $0.40 Timber 13.38 M.B.M. 43.00 Iron 1,575 lbs 0.035 Bridge ties 5.15 M.B.M. 34.00	As per Exhibit 1 Deduct:— Scrap rail 2.679 tons @ $14.00 Track spikes 3.16 cwt. 2.10 Total as per Dxhibit 1	38 7 45 1,285	100 62	35 4 42 671	416 521 86 217	50 50 62 50	208 260 53 108	192 575 55 175					
Manistique																										

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A			1911			1912			1913		
									C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
									$		$	$		$	$		$
				Guard rail 2.6790 tons 14.00		Deduct	45	42	38	100	38				1,240		629
				Guard rail spikes 3.16 cwt. 2.10		Add timber 4.820 M.B.M. @ $43.64			7	62	4				210	95	200
									1,285		671	997	80	798	1,450		829
88.7	120	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1			53	50	26	48			221		113
				Timber 2.75 M.B.M. 43.64	Timber 3.16 M.B.M. 43.00	Add timber 0.749 M.B.M. @ $43.64			120	50	60	136			33	95	31
				Wrought iron 308 lbs													
				Cast ir. 68 lbs													
				Total ——													
				iron 376 lbs 0.035	Iron 400 lbs 0.035				13	70	9	14					
				Bridge ties (0. 82 M.B.M.)	Bridge ties												
				17 2.0875	0.80 M.B.M. 34.00				35	50	18	27					
									221		113	225	50	113	254		144
89.3	121	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1			53	68	36	48			221		127
				Timber 2.75 M.B.M 43.64	Timber 3.16 M.B.M. 43.00	Add timber 0.749 M.B.M. @ $43.64			120	52	62	136			33	95	31
				Wrought iron 308 lbs													
				Cast ir. 68 lbs													
				Total ——													
				iron 376 lbs 0.035	Iron 400 lbs 0.035				13	84	11	14					
				Bridge ties (0.82 M.B.M.)	Bridge ties												
				17 2.0875	0.80 M.B.M. 34.00				35	52	18	27					
									221		127	225	60	135	254		158

90.7	123	64	5	Piling 500 lin. ft. @ $0.40		Piling 300 lin. ft. @ 0.40		As per Exhibit 1						200	68	136	120								
				Timber		Timber		Deduct:—																	
				7.83 M.B.M.	43.64	8.63 M.B.M.	43.00	Scrap rail																	
				Wrought iron				1.607 tons @	$14.00	23	100	23		342	52	178	371								
				999 lbs				Track spikes																	
				Cast iron				1.93 cwt.	2.10	4		3													
				289 lbs						27		26													
				Total ——																					
				iron 1,288 lbs	0.035	Iron 1,000 lbs	0.035							45	84	37	35								
				Bridge ties (3.12 M.B.M.)		Bridge ties																			
				65	2.0875	3.2 M.B.M.	34.00	Total as per Exhibit 1		750		448		136	52	71	108								
				Guard rail																					
				1.6074 tons	14.00			Deduct		27		26		23	100	23					723		422
				Guard rail spikes				Add timber																	
				1.93 cwt.	2.10			2.995 M.B.M.	43.64					4	84	3					131	95	124
														750		448	634	60	380	854			546
93.0	127	32	3	Piling 300 lin. ft. @ $0.40		Piling 180 lin. ft. @ $0.40		Total as per Exhibit 1						120	50	60	72				381			196	
				Timber		Timber		Add timber																	
				3.85 M.B.M.	43.64	5.00 M.B.M.	43.00	1.498 M.B.M.	43.64					168	50	84	215				65	95	62		
				Wrought iron																					
				551 lbs																					
				Cast ir. 147 lbs																					
				Total ——																					
				iron 698 lbs	0.035	Iron 600 lbs	0.035							24	72	18	21								
				Bridge ties (1.59 M.B.M.)		Bridge ties																			
				33	2.0875	1.60 M.B.M.	34.00							69	50	34	54								
														381		196	362	50	181	446			258		
93.5	128	48	4	Piling 400 lin. ft. @ $0.40		Piling 240 lin. ft. @ $0.40		Total as per Exhibit 1						160	68	109	96				570			334	
				Timber		Timber		Add timber																	
				6.20 M.B.M.	43.64	7.34 M.B.M.	43.00	2.246 M.B.M. @	$43.64					271	52	141	316				98	95	93		
				Wrought iron																					
				820 lbs																					
				Cast ir. 235 lbs																					
				Total ——																					
				iron 1,055 lbs	0.035	Iron 960 lbs	0.035							37	84	31	34								

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A				1911			1912			1913		
										C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
										$		$	$		$	$		$
				Bridge ties (2.35 M.B.M.) 49 2.0875	Bridge ties 2.40 M.B.M. 34.00					102	52	53	81					
										570		334	527	60	316	668		427
95.5	132	119	8	Piling 1,120 lin. ft. @ $0.40	Piling 800 lin. ft. @ $0.40	Total as per Exhibit 1				448	68	305	320					
				Timber 15.05 M.B.M. 43.64	Timber 14.68 M.B.M. 43.00	Deduct:— Scrap rail 2.679 tons	@ $14.00	38	100 38	657	52	342	631					
				Wrought iron 2,040 lbs		Track spikes 3.27 cwt.	2.10	7	84 6									
				Cast iron 756 lbs				45	44									
				Total —— iron 2,796 lbs 0.035	Iron 1,610 lbs 0.035					97	84	82	56					
				Bridge ties (5.76 M.B.M.) 120 2.0875	Bridge ties 5.95 M.B.M. 34.00	Total as per Exhibit 1		1,497	903	250	52	130	202					
				Guard rail 2.6786 tons 14.00		Deduct		45	44	38	100	38				1,452		859
				Guard rail spikes 3.27 cwt. 2.10		Add timber 7.711 M.B.M.	43.64			7	84	6				335	95	318
										1,497		903	1,209	60	725	1,787		1,177
96.1	134	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1				53	60	32	48			221		121
				Timber 2.75 M.B.M. 43.64	Timber 3.16 M.B.M. 43.00	Add timber 0.749 M.B.M.	@ $43.64			120	50	60	136			33	95	31
				Wrought iron 308 lbs														
				Cast ir. 68 lbs														
				Total —— iron 376 lbs 0.035	Iron 400 lbs 0.035					13	80	11	14					

				Bridge ties (0.82 M.B.M.)			Bridge ties							35	50	18	27							
				17		2.0875	0.80 M.B.M.		34.00															
														221		121	225	50	113	254		152		
96.5	135	16	2	Piling 132 lin. ft. @		$0.40	Piling 120 lin. ft. @		$0.40	Totals as per Exhibit 1				53	50	26	48			221		113		
				Timber			Timber			Add timber														
				2.75 M.B.M.		43.64	3.16 M.B.M.		43.00	0.749 M.B.M. @		$43.64		120	50	60	156			33	95	.31		
				Wrought iron																				
				308 lbs																				
				Cast ir. 68 lbs																				
				Total ——																				
				iron 376 lbs		0.035	Iron 400 lbs		0.035					13	72	9	14							
				Bridge ties (0.82 M.B.M.)			Bridge ties							35	50	18	27							
				17		2.0875	0.80 M.B.M.		34.00															
														221		113	225	50	113	254		144		
97.5	138	16	2	Piling 132 lin. ft. @		$0.40	Piling 120 lin. ft. @		$0.40	Total as per Exhibit 1				53	50	26	48			221		113		
				Timber			Timber			Add timber														
				2.75 M.B.M.		43.64	3.16 M.B.M.		43.00	0.749 M.B.M.		43.64		120	50	60	136			33	95	31		
				Wrought iron																				
				308 lbs																				
				Cast ir. 68 lbs																				
				Total ——																				
				iron 376 lbs		0.035	Iron 400 lbs		0.035					13	70	9	14							
				Bridge ties (0.82 M.B.M.)			Bridge ties							35	50	18	27							
				17		2.0875	0.80 M.B.M.		34.00															
														221		113	225	50	113	254		144		
98.2	140	16	2	Piling 132 lin. ft. @		$0.40	Piling 120 lin. ft. @		$0.40	Total as per Exhibit 1				53	60	32	48			221		121		
				Timber			Timber			Add timber														
				2.75 M.B.M.		43.64	3.16 M.B.M.		43.00	0.749 M.B.M.		43.64		120	50	60	136			33	95	31		
				Wrought iron																				
				308 lbs																				
				Cast ir. 68 lbs																				
				Total ——																				
				iron 376 lbs		0.035	Iron 400 lbs		0.035					13	80	11	14							

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
							C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
							$		$	$		$	$		$
				Bridge ties (0.82 M.B.M.) 17 2.0875	Bridge ties 0.80 M.B.M. 34.00		35	50	18	27					
							221		121	225	50	113	254		152
98.9	141	48	4	Piling 400 lin. ft. @ $0.40 Timber 6.13 M.B.M. 43.64 Wrought iron 820 lbs Cast ir. 235 lbs Total —— iron 1,055 lbs 0.035 Bridge ties (2.35 M.B.M.) 49 2.0875	Piling 240 lin. ft. @ $0.40 Timber 6.81 M.B.M. 43.00 Iron 800 lbs 0.035 Bridge ties 2.40 M.B.M. 34.00	Total as per Exhibit 1 Add timber 2.246 M.B.M. @ $43.64	160	68	109	96			567		332
							268	52	139	392			98	95	93
							37	84	31	28					
							102	52	53	81					
							567		332	597	60	358	665		425
99.5	142	64	5	Piling 500 lin. ft. @ $0.40 Timber 7.83 M.B.M. 43.64 Wrought iron 999 lbs Cast iron 2.89 lbs Total —— iron 1,288 lbs 0.035 Bridge ties (3.12 M.B.M.) 65 2.0875	Piling 480 lin. ft. @ $0.40 Timber 8.63 M.B.M. 43.00 Iron 990 lbs 0.035 Bridge ties 3.20 M.B.M. 34.00	As per Exhibit 1 Deduct:— Scrap rail 1.607 tons @ $14.00 23 100 23 Track spikes 1.93 cwt. 2.10 4 84 3 27 26 Total as per Exhibit 1 750 448	200	68	136	192					
							342	52	178	371					
							45	84	37	35					
							136	52	71	108					

				Guard rail 1.6074 tons 14.00 Guard rail spikes 1.93 cwt. 2.10				Deduct Add timber 2.995 M.B.M. 43.64	27		26	23 4	100 84	23 3				723 131		422 124
												750		448	706	60	424	854		546
101.4	145	110	8	Piling 800 lin. ft. @ $0.40 Timber 12.70 M.B.M. 43.64 Wrought iron 1,668 lbs Cast iron 509 lbs Total iron 2,177 lbs 0.035 Bridge ties (5.33 M.B.M.) 111 2.0875 Guard rail 2.6790 tons 14.00 Guard rail spikes 3.20 cwt. 2.10	Piling 800 lin. ft. @ $0.40 Timber 13.95 M.B.M. 43.00 Iron 1590 lbs 0.035 Bridge ties 5.50 M.B.M. 34.00			As per Exhibit 1 Deduct:— Scrap rail 2.679 tons @ $14.00 Track spikes 3.20 cwt. 2.10 Total as per Exhibit 1 Deduct Add timber 51.48 M.B.M. 43.64	45 1227 45	100 84	44 38 6 44 735 44	320 554 76 232 38 7	68 52 84 52 100 84	218 288 64 121 38 6	320 600 55 187			1,182 225		691 214
												1,227		735	1,162	60	697	1,407		905
101.9	146	80	6	Piling 720 lin. ft. @ $0.40 Timber 9.91 M.B.M. 43.64 Wrought iron 1,475 lbs Cast iron 332 lbs Total iron 1,807 lbs 0.035 Bridge ties (3.89 M.B.M.) 81 2.0875	Piling 630 lin. ft. @ $0.50 Timber 10.46 M.B.M. 43.00 Iron 1,195 lbs 0.035 Bridge ties 4.00 M.B.M. 34.00			As per Exhibit 1 Deduct:— Scrap rail 2.143 tons @ $14.00 Track spikes 2.51 cwt. 2.10 Total as per Exhibit 1	30 5 35 998	100 84	30 4 34 597	288 432 64 169	68 52 84 52	196 225 54 88	252 450 42 136					

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A				1911			1912			1913		
										C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
										$		$	$		$	$		$
				Guard rail 2.1432 tons 14.00		Deduct	35		34	30	100	30				953		563
				Guard rail spikes 2.51 cwt. 2.10		Add timber 3.744 M.B.M. 43.64				5	84	4				163		155
										988		597	880	60	528	1,116		718
104.5	148	128	9	Piling 720 lin. ft. @ $0.40	Piling 540 lin. ft. @ $0.40	As per Exhibit 1				288	68	196	216					
				Timber 14.87 M.B.M. 43.64	Timber 15.94 M.B.M. 43.00	Deduct:— Scrap rail 2.679 tons @ $14.00	38	100	38	649	52	337	685					
				Wrought iron 1,888 lbs		Track spikes 3.34 cwt. 2.10	7	84	6									
				Cast iron 570 lbs														
				Total ——			45		44									
				iron 2,458 lbs 0.035	Iron 1,795 lbs 0.035					86	84	72	63					
				Bridge ties (6.19 M.B.M.) 129 2.0875	Bridge ties 6.40 M.B.M. 34.00	Total as per Exhibit 1	1,337		789	269	52	140	218					
				Guard rail 2.6790 tons 14.00		Deduct	45		44	38	100	38				1,292		745
				Guard rail spikes 3.34 cwt. 2.10		Add timber 5.990 M.B.M. 43.64				7	84	6				261	95	248
										1,337		789	1,182	60	709	1,553		993
112.7	154	126½	9	Piling 1,260 lin. ft. @ $0.40	Piling 1,350 lin. ft. @ $0.40	As per Exhibit 1				504	50	252	540					
				Timber 16.16 M.B.M. 43.64	Timber 15.82 M.B.M. 43.00	Deduct:— Scrap rail 2.679 tons @ $14.00	38	100	38	705	50	352	680					

				Wrought iron 2,181 lbs Cast iron 750 lbs Total —— iron 2,931 lbs 0.035 Bridge ties (6.14 M.B.M.) 128 2.0875 Guard rail 2.6790 tons 14.00 Guard rail spikes 3.34 cwt. 2.10				Track spikes 3.34 cwt. 2.10	7	50	4										
										45		42													
					Iron 1,800 lbs 0.035 Bridge ties 6.33 M.B.M. 34.00								102	74	75	63								
									Total as per Exhibit 1	1,623		855	267	50	134	215								
									Deduct	45		42	38	100	38				1,578		813			
									Add timber 5.920 M.B.M. 43.64				7	50	4				258		245			
													1,623		855	1,498	50	749	1,836		1,058			
127.0	177	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 308 lbs Cast ir. 68 lbs Total —— iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875		Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00 Iron 400 lbs @ 0.035 Bridge ties 0.80 M.B.M. 34.00			Total as per Exhibit 1 Add timber 0.749 M.B.M. 43.64				53	50	26	48			221		112			
													120	50	60	136			33		31			
													13	68	8	14								
													35	50	18	27								
													221		112	225	50	113	254		143			
133.9	182	16	2	Piling 200 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 308 lbs Cast ir. 68 lbs Total —— iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875		Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00 Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00			Total as per Exhibit 1 Add timber 0.749 M.B.M. 43.64				80	52	42	48			221		130			
													120	50	60	136			33	95	31			
													13	76	10	14								
													35	50	18	27								
													248		130	225	50	113	254		161			

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A				1911			1912			1913		
										C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
137.6	187	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 306 lbs Cast ir. 68 lbs Total — iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0675	Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00 Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00	Total as per Exhibit 1 0.749 M.B.M. @ $43.64				$ 53 120 13 35	80 70 90 70	$ 42 84 12 24	$ 48 136 14 17		$	$ 221 33 95		$ 162 31
										221		162	225	70	158	254		193
151.0	193	239	15	Piling 1,500 lin. ft. @ $0.40 Timber 33.00 M.B.M. 43.64 Wrought iron 4,685 lbs Cast iron 1,724 lbs Total — iron 6,389 lbs 0.035 Bridge ties (11.52 M.B.M.) 240 2.0675 Guard rail 4.8222 tons 14.00 Guard rail spikes 6.03 cwt. 2.10	Piling 1,500 lin. ft. @ $0.40 Timber 28.11 M.B.M. 43.00 Iron 3,030 lbs 0.035 Bridge ties 11.95 M.B.M. 34.00	As per Exhibit 1 Deduct:— Scrap rail 4.822 tons $14.00 Track spikes 6.03 cwt. 2.10 Total as per Exhibit 1 Deduct Add timber 11.185 M.B.M. 43.64	68 13 81 2,845 81	100 82 	68 11 79 1,616 79	600 1,440 223 501 68 13	64 50 82 50 100 82	384 720 183 250 68 11	600 1,209 106 406			2,764 488	95	1,537 464
										2,845		1,616	2.321	60	1,393	3,252		2,001

153.5	196	817	51	Piling 6,400 lin. ft. @ $0.40 Timber 147.68 M.B.M. 43.64 Wrought iron 20,242 lbs Cast iron 8,155 lbs Total —— iron 28,397 lbs 0.035 Bridge ties (39.26 M.B.M.) 818 2.0875 Guard rail 15.0024 tons 14.00 Guard rail spikes 19.49 cwt. 2.10	Piling 6,630 lin. ft. @ $0.40 Timber 94.01 M.B.M. 43.00 Iron 10,240 lbs 0.035 Bridge ties 40.85 M.B.M. 34.00	Piling 800 lin. ft. @ $0.40 Timber 18.46 M.B.M. 43.64 Wrought iron 2,530 lbs Cast iron 1,020 lbs Total —— iron 3,550 lbs 0.035 Bridge ties (4.90) M.B.M. 102 2.09 Note:—700 ft. of this trestle was filled in May, 1913.				2,560 6,445 993 1,708 210 41 11,957	60 50 80 50 100 80	1,536 3,222 794 854 210 33 6,649	2,652 4,042 358 1,389 8,441	60	5,065	320 806 125 214 1,465	60 50 80 50	192 403 100 107 802
	1a			Brimley to Bay Mills: Length 7,571'—235 bents. Piling 23,500 lin. ft. @ $0.40 Timber 900.00 M.B.M. 43.64 Wrought iron 131,300 lbs Cast iron 58,700 lbs Total —— iron 190,000 lbs 0.035 Bridge ties (363.46 M.B.M.) 7,572 2.0875 Guard rail 136.0932 tons 14.00 Guard rail spikes 177.20 cwt. 2.10	Length 4,200'—280 bents. Piling 16,400 lin. ft. @ $0.40 Timber 490.00 M.B.M. 43.00 Iron 55,500 lbs 0.035 Bridge ties 210.00 M.B.M. 34.00	Trestle abandoned. Track taken up Nov., 1912. Structure still there but not safe for traffic.				9,400 39,276 6,650 15,807 1,905 372 73,410	50 50 62 50 100 62	4,700 19,638 4,123 7,904 1,905 231 38,501	6,560 21,070 1,943 7,140 36,713	40	14,685			
				Total Sault Ste. Marie to Marquette							118259		63,307	74,970		36,249	37,762		22,811

TRESTLES—Continued

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
							C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
							$		$	$		$	$		$
				ST. IGANCE TO SOO JUNCTION:											
3.7	11A	16	2	Piling 160 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1	64	64	41	48			232		130
				Timber	Timber	Add timber									
				2.75 M.B.M. 43.64	3.16 M.B.M. 43.00	0.749 M.B.M. @ $43.64	120	50	60	136			33	95	31
				Wrought iron											
				306 lbs											
				Cast ir. 68 lbs											
				Total ——											
				iron 376 lbs 0.035	Iron 400 lbs 0.035		13	82	11	14					
				Bridge ties (0.82 M.B.M.)	Bridge ties										
				17 2.0875	0.80 M.B.M. 34.00		35	50	18	27					
							232		130	225	60	175	265		161
6.2	15A	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1	53	64	34	48			221		123
				Timber	Timber	Add timber									
				2.75 M.B.M. 43.64	3.16 M.B.M. 43.00	0.749 M.B.M. 43.64	120	50	60	136			33	95	31
				Wrought iron											
				306 lbs											
				Cast ir. 68 lbs											
				Total ——											
				iron 376 lbs 0.035	Iron 400 lbs 0.035		13	82	11	14					
				Bridge ties (0.82 M.B.M.).	Bridge ties										
				17 2.0875	0.80 M.B.M. 34.00		35	50	18	27					
							221		123	225	60	135	254		154
15.8	34A	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1	53	64	34	48			221		123
				Timber	Timber	Add timber									
				2.75 M.B.M. 43.64	3.16 M. 3.M. 43.00	0.749 M.B.M. 43.64	120	50	60	136			33	95	31
				Wrought iron											
				306 lbs											

				Cast ir. 66 lbs Total —— iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875		Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00					13	82	11	14					
												35	50	18	27					
												221		123	225	60	135	254		154
18.2	41A	48	4	Piling 400 lin. ft. @ $0.40 Timber 6.53 M.B.M. 43.64 Wrought iron 897 lbs Cast ir. 168 lbs Total —— iron 1,065 lbs 0.035 Bridge ties (2.35 M.B.M.) 49 2.0875		Piling 240 lin. ft. @ $0.40 Timber 6.81 M.B.M. 43.00 Iron 800 lbs 0.035 Bridge ties 2.40 M.B.M. 34.00		Total as per Exhibit 1 Add timber 2.246 M.B.M. 43.64			160	64	102	96			584		325
												285	50	142	293			98	95	93
												37	82	30	28					
												102	50	51	82					
												584		325	499	60	299	682		418
22.5	50A	48	4	Piling 400 lin. ft. @ $0.40 Timber 5.02 M.B.M. 43.64 Wrought iron 795 lbs Cast ir. 132 lbs Total —— iron 927 lbs 0.035 Bridge ties (2.35 M.B.M.) 49 2.0875		Piling 240 lin. ft. @ $0.40 Timber 6.81 M.B.M. 43.00 Iron 800 lbs 0.035 Bridge ties 2.40 M.B.M. 34.00		Total as per Exhibit 1 Add timber 2.246 M.B.M. @ $43.64			160	64	102	96			514		290
												219	50	110	293			98	95	93
												33	82	27	28					
												102	50	51	82					
												514		290	499	60	299	612		383
27.5	68A	48	5	Piling 500 lin. ft. @ $0.40 Timber 5.50 M.B.M. 43.64 Wrought iron 941 lbs		Piling 300 lin. ft. @ $0.40 Timber 7.34 M.B.M. 43.00		Total as per Exhibit 1 Add timber 2.246 M.B.M. 43.64			200	80	160	120			580		433
												240	70	168	316			98	95	93

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A			1911			1912			1913		
									C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
									$		$	$		$	$		$
				Cast ir. 154 lbs Total —— iron 1,095 lbs 0.035 Bridge ties (2.35 M.B.M.) 49 2.0875	Iron 960 lbs 0.035 Bridge ties 2.40 M.B.M. 34.00				38 102	90 70	34 71	34 82					
									580		433	552	70	386	678		526
36.8	95 A	62	5	Piling 540 lin. ft. @ $0.40 Timber 8.53 M.B.M. 43.64 Wrought iron 1,033 lbs Cast iron 204 lbs Total —— iron 1,237 lbs 0.035 Bridge ties (3.02 M.B.M.) 63 2.0875 Guard rail 1.6074 tons 14.00 Guard rail spikes 1.90 cwt. 2.10	Piling 625 lin. ft. @ $0.40 Timber 8.47 M.B.M. 43.00 Iron 990 lbs 0.035 Bridge ties 3.10 M.B.M. 34.00	As per Exhibit 1 Deduct:— Scrap rail 1.607 tons @ $14.00 Track spikes 1.90 cwt. 2.10 Total as per exhibit 1 Deduct Add timber 2.902 M.B.M. 43.64	23 4 27 790 27	23 3 26 432 26	216 372 43 132 23 4	56 50 78 50 100 78	121 186 33 66 23 3	250 364 35 105			763		406
									790		432	754	50	377	890		527
38.3	100A	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 308 lbs	Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00	Total as per Exhibit 1 Add timber 3.749 M.B.M. @ $43.64			53 120	56 50	30 60	48 136			221 33	95	119 31

				Cast ir. 68 lbs Total —— iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875		Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00					13	78	11	14					
											35	50	18	27					
											221		119	225	50	113	254		150
39.0	101A	173	22	Piling 2,260 lin. ft. @ $0.40 Timber 31.88 M.B.M. 43.64 Wrought iron 3,970 lbs Cast iron 1,488 lbs Total —— iron 5,458 lbs 0.035 Bridge ties (8.35 M.B.M.) 174 2.0875 Guard rail 3.7506 tons 14.00 Guard rail spikes 4.62 cwt. 2.10		Piling 2,200 lin. ft. @ $0.40 Timber 26.47 M.B.M. 43.00 Iron 3,940 lbs 0.035 Bridge ties 8.65 M.B.M. 34.00		As per Exhibit 1 Deduct:— Scrap rail 3.751 tons @ $14.00 Track spikes 4.62 cwt. 2.10 Total as per Exhibit 1 Deduct Add timber 8.096 M.B.M. 43.64	53 10 63 2,912 63	53 8 61 1,594 61	904 1,391 191 363 53 10	56 50 78 50 100 78	506 696 149 182 53 8	880 1,138 138 294			2,849 353		1,533 335
											2,912		1,594	2,450	50	1,225	3,202		1,868
40.9	105A	48	4	Piling 500 lin. ft. @ $0.40 Timber 6.53 M.B.M. 43.64 Wrought iron 897 lbs Cast ir. 168 lbs Total —— iron 1,065 lbs 0.035 Bridge ties (2.35 M.B.M.) 49 2.0875		Piling 400 lin. ft. @ $0.40 Timber 6.81 M.B.M. 43.00 Iron 800 lbs 0.035 Bridge ties 2.40 M.B.M. 34.00		Total as per Exhibit 1 Add timber 2.246 M.B.M. @ $43.64			200 285 37 102	50 50 50 50	100 142 19 51	160 293 28 82			624 98	95	312 93
											624		312	563	50	282	722		405

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A			1911			1912			1913		
									C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
									$		$	$		$	$		$
42.5	109A	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1			53	68	36	48			221		127
				Timber	Timber	Add timber											
				2.75 M.B.M. 43.64	3.16 M.B.M. 43.00	0.749 M.B.M. @ $43.64			120	52	136				33	95	31
				Wrought iron													
				308 lbs													
				Cast ir. 68 lbs													
				Total ——													
				iron 376 lbs 0.035	Iron 400 lbs 0.035				13	84	11	14		14			
				Bridge ties (0.82 M.B.M.)	Bridge ties												
				17 2.0875	0.80 M.B.M. 34.00				35	52	18	27		27			
									221		127	225	60	135	254		158
					Total St. Ignace to Soo Junction				7,120		4,008	6,442		3,521	8,067		4,904
					Total Sault Ste. Marie to Marquette				118259		63,307	74,970		36,249	37,762		22,811
				Total East of Marquette					125379		67,315	81,412		39,770	45,829		27,715
				MARQUETTE TO HOUGHTON													
				MARQUETTE TO NESTORIA:													
164.0	215	60	5	Piling 600 lin. ft. @ $0.40	Piling 600 lin. ft. @ $0.40	As per Exhibit 1			240	96	230	240					
	Double track					Deduct:—											
				Timber	Timber	Scrap rail											
				33.45 M.B.M. 43.64	16.62 M.B.M. 43.00	3.2148 tons @ $14.00	45	45	1,460	94	1,372	715					
				Wrought iron		Track spikes											
				3,647 lbs		3.76 cwt. 2.10	8	8									
				Cast iron													
				1,245 lbs			53	53									
				Total ——													
				iron 4,892 lbs 0.035	Iron 1,970 lbs 0.035				172	98	168	69					
				Bridge ties (5.86 M.B.M.)	Bridge ties												
				122 2.0875	3.00 M.B.M. 34.00				255	94	240	102					

				Guard rail 3.2148 tons 14.00 Guard rail spikes 3.76 cwt. 2.10				Total as per Exhibit 1	2,180		2,063	45	100	45							
								Deduct	53		53	8		8				2,127		2,010	
												2,180		2,063	1,126	90	1,013	2,127		2,010	
164.1	216	72	6	Piling 720 lin. ft. @ $0.40	Piling 720 lin. ft. @ $0.40			As per Exhibit 1				288	96	276	288						
	Double track			Timber 38.77 M.B.M. 43.64 Wrought iron 4,612 lbs Cast iron 1,302 lbs Total ——	Timber 19.60 M.B.M. 43.00			Deduct:— Scrap rail 4.286 tons @ $14.00 Track spikes 4.87 cwt. 2.10	60 10		60 10	1,692	94	1,590	843						
									70		70										
				iron 5,914 lbs 0.035 Bridge ties (7.01 M.B.M.) 146 2.0875	Iron 2,360 lbs 0.035 Bridge ties 3.60 M.B.M. 34.00							207 305	98 94	203 287	83 122						
				Guard rail 4.286 tons 14.00 Guard rail spikes 4.87 2.10				Total as per Exhibit 1	2,562		2,426	60	100	60							
								Deduct	70		70	10		10				2,492		2,356	
												2,562		2,426	1,336	90	1,202	2,492		2,356	
174.7	240	24	3	Piling 300 lin. ft. @ $0.40 Timber 2.99 M.B.M. 43.64 Wrought iron 468 lbs Cast ir. 116 lbs Total ——	Piling 180 lin. ft. @ $0.40 Timber 4.33 M.B.M. 43.00			Out. See Bridges.				120 131	50 50	60 66	72 186						
				iron 584 lbs 0.035 Bridge ties (1.20 M.B.M.) 25 2.0875	Iron 580 lbs 0.035 Bridge ties 1.20 M.B.M. 34.00							20 52	70 50	14 26	20 41						
												323		166	319	40	128				

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
							$		$	$		$	$		$
178.0	241	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 308 lbs Cast ir. 68 lbs Total —— iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875	Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00 Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00	Total as per Exhibit 1 Add timber 0.749 M.B.M. @ $43.64	53 120 13 35	50 50 68 50	26 60 8 18	48 136 14 27			221 33	95	112 31
							221		112	225	50	113	254		143
178.0	242	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 308 lbs Cast ir. 68 lbs Total —— iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875	Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00 Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00	Total as per Exhibit 1 Add timber 0.749 43.64	53 120 13 35	50 50 68 50	26 60 8 18	48 136 14 27			221 33	95	112 31
							221		112	225	50	113	254		143
180.4	249	71	6	Piling 600 lin. ft. @ $0.40 Timber 8.96 M.B.M. 43.64	Piling 600 lin. ft. @ $0.40 Timber 9.43 M.B.M. 43.00	As per Exhibit 1 Deduct:— Scrap rail 2.14 tons @ $14.00 30 30	240 391	76 64	182 250	240 418					

THIS PA
VERTIC

				Wrought iron 1,335 lbs Cast iron 421 lbs Total — iron 1,756 lbs 0.035 Bridge ties (3.46 M.B.M.) 72 2.0875 Guard rail 2.1432 tons 14.00 Guard rail spikes 2.44 cwt. 2.10		Iron 1,175 lbs 0.035 Bridge ties 3.55 M.B.M. 34.00 Dry wall 144 c. y. 8.00		Track spikes 2.44 cwt. 2.10 Total as per Exhibit 1 Deduct Add timber 3.323 M.B.M. 43.64	5 878 35 —	4 616 34 —	62 150 30 5	88 64 100 88	54 96 30 4 1,120	41 121			843 146	95	582 139
										878		616	1,940	70	1,358	989		721
183.2	256	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 308 lbs Cast ir. 68 lbs Total — iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875		Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00 Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00		Total as per Exhibit 1 Add timber 0.749 M.B.M. @ $43.64			53 120 13 35	64 50 82 50	34 60 11 18	48 136 14 27			221 33	95	123 31
										221		123	225	60	135	254		154
192.1	273	32	3	Piling 300 lin. ft. @ $0.40 Timber 3.85 M.B.M. 43.64 Wrought iron 551 lbs Cast ir. 147 lbs Total — iron 698 lbs 0.035 Bridge ties (2.58 M.B.M.) 33 2.0875		Piling 180 lin. ft. @ $0.40 Timber 4.98 M.B.M. 43.00 Iron 600 lbs 0.035 Bridge ties 1.60 M.B.M. 34.00		Total as per Exhibit 1 Add timber 1.498 M.B.M. @ $43.64			120 168 24 69	56 50 78 50	67 84 19 34	72 214 21 54			381 65	95	204 62
										381		204	361	50	181	446		266

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS

TRESTLES—Continued

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A			1911			1912			1913		
									C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
									$		$	$			$		$
194.4	281	64	5	Piling 500 lin. ft. @ $0.40	Piling 500 lin. ft. @ $0.40	As per Exhibit 1			200	50	100	200					
				Timber	Timber	Deduct:—											
				7.83 M.B.M. 43.64	8.63 M.B.M. 43.00	Scrap rail											
				Wrought iron		1.607 tons @ $14.00	23	23	342	50	171	371					
				999 lbs		Track spikes											
				Cast iron		1.93 cwt. 2.10	4	3									
				289 lbs			27	26									
				Total ——													
				iron 1,288 lbs 0.035	Iron 1,000 lbs 0.035				45	70	31	35					
				Bridge ties (3.12 M.B.M.)	Bridge ties												
				65 2.0875	3.20 M.B.M. 34.00	Total as per Exhibit 1	750	396	136	50	68	109					
				Guard rail		Add timber											
				1.6074 tons 14.00		Deduct	27	26	23	100	23				723		370
				Guard rail spikes		Add timber											
				1.93 cwt. 2.10		2.995 M.B.M. 43.64			4	70	3				131	95	124
									750		396	715	50	358	854		494
198.3	289	39	4	Piling 400 lin. ft. @ $0.40	Piling 240 lin. ft. @ $0.40	Total as per Exhibit 1			160	50	80	96			494		251
				Timber	Timber	Add timber											
				5.10 M.B.M. 43.64	6.08 M.B.M. 43.00	1.825 M.B.M. 43.64			223	50	112	261			80	95	76
				Wrought iron													
				611 lbs													
				Cast ir. 168 lbs													
				Total ——													
				iron 779 lbs 0.035	Iron 775 lbs 0.035				27	62	17	27					
				Bridge ties (1.92 M.B.M.)	Bridge ties												
				40 2.0875	1.95 M.B.M. 34.00				84	50	42	66					
									494		251	450	50	225	574		327

198.8	290	16	2	Piling 132 lin. ft. @ $0.40		Piling 120 lin. ft. @ $0.40		Total as per Exhibit 1					53	50	26	48			221		112
				Timber		Timber		Add timber													
				2.75 M.B.M.	43.64	3.16 M.B.M.	43.00	0.749 M.B.M.	43.64				120	50	60	136			33	95	31
				Wrought iron 308 lbs																	
				Cast ir. 68 lbs																	
				Total ——																	
				iron 376 lbs	0.035	Iron 400 lbs	0.035						13	62	8	14					
				Bridge ties (0.82 M.B.M.)		Bridge ties															
				17	2.0675	0.80 M.B.M.	34.00						35	50	18	27					
													221		112	225	50	113	254		143
				Dead River Branch:																	
		150	10	Omitted		Piling															
						1,100 lin. ft. @ $0.40		Omitted								440					
						Timber															
						1.80 M.B.M.	43.00									774					
						Iron 2,000 lbs	0.035									70					
						Bridge ties															
						7.5 M.B.M.	34.00									255					
																1,539	50	770			
				Beaufort Mine Branch:																	
		32	3	Omitted		Piling 300 lin. ft. @ $0.40		Omitted								120					
						Timber															
						5.00 M.B.M.	43.00									215					
						Iron 600 lbs	0.035									21					
						Bridge ties															
						1.6 M.B.M.	34.00									54					
																410	50	205			
				Marquette to Winthrop Junction—(South Line):																	
3.8	6B	96	7	Piling		Piling															
				980 lin. ft. @ $0.40		1,050 lin. ft. @ $0.40		As per Exhibit 1					392	52	204	420					
								Deduct:—													
				Timber		Timber		Scrap rail													
				19.93 M.B.M.	43.64	12.29 M.B.M.	43.00	2.143 tons @	$14.00	30		30	870	50	435	528					

TRESTLES—Continued

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A			1911			1912			1913		
									C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
									$		$	$		$	$		$
				Wrought iron 2,833 lbs Cast iron 1,115 lbs Total ——		Track spikes 2.62 cwt. 2.10	6	5									
							36	35									
				iron 3,948 0.035	Iron 1,400 lbs 0.035				138	70	105	49					
				Bridge ties (4.66 M.B.M.) 97 2.0675	Bridge ties 4.80 M.B.M. 34.00	Total as per Exhibit 1	1,638	880	202	50	101	163					
				Guard rail 2.1432 tons 14.00		Deduct	36	35	30	100	30				1,602		845
				Guard rail spikes 2.62 cwt. 2.10		Add timber 4.493 M.B.M. 43.64			6	70	5				196	95	186
									1,638		880	1,160	50	580	1,798		1,031
4.6	9B	157	11	Piling 1,400 lin. ft. @ $0.40	Piling 1,540 lin. ft. @ $0.40	As per Exhibit 1			560	60	336	616					
				Timber 24.23 M.B.M. 43.64	Timber 19.43 M.B.M. 43.00	Deduct:— Scrap rail 3.215 tons @ $14.10	45	45	1,057	50	528	835					
				Wrought iron 3,470 lbs Cast iron 1,365 lbs Total ——		Track spikes 4.04 cwt. 2.10	8	6									
							53	51									
				iron 4,835 lbs 0.035	Iron 2,200 lbs 0.035				169	80	135	77					
				Bridge ties (7.58 M.B.M.) 158 2.0675	Bridge ties 7.90 M.B.M. 34.00	Total as per Exhibit 1	2,160	1,215	330	50	165	209					
				Guard rail 3.2148 tons 14.00		Deduct	53	51	45	100	45				2,116		1,164
				Guard rail spikes 4.04 cwt. 2.10		Add timber 7.348 M.B.M. 43.64			8	80	6				320	95	304
									2,169		1,215	1,797	60	1,078	2,436		1,468

6.0	103	32	3	Piling 300 lin. ft. @ $0.40 Timber 3.85 M.B.M. 43.64 Wrought iron 551 lbs Cast ir. 147 lbs Total —— iron 698 lbs 0.035 Bridge ties (1.58 M.B.M.) 33 2.0875	Piling 180 lin. ft. @ $0.40 Timber 4.98 M.B.M. 43.00 Iron 600 lbs 0.035 Bridge ties 1.60 M.B.M. 34.00	Total as per Exhibit 1 Add timber 1.498 M.B.M. 43.64				120	60	72	72			381		209
										168	50	84	214			65	95	62
										24	80	19	21					
										69	50	34	54					
										381		209	361	60	217	446		271
6.7	11B	71	6	Piling 600 lin. ft. @ $0.40 Timber 8.31 M.B.M. 43.64 Wrought iron 1,090 lbs Cast iron 301 lbs Total —— iron 1,391 lbs 0.035 Bridge ties (3.46 M.B.M.) 72 2.0875 Guard rail 2.1432 tons 14.00 Guard rail spikes 2.44 cwt. 2.10	Piling 360 lin. ft. @ $0.40 Timber 9.73 M.B.M. 43.00 Iron 1,175 lbs 0.035 Bridge ties 3.55 M.B.M. 34.00	As per Exhibit 1 Deduct:— Scrap rail 2.143 tons @ $14.00 Track spikes 2.44 cwt. 2.10 Total as per Exhibit 1 Deduct Add timber 3.323 M.B.M. 43.64	30 5 35 837 35	30 3 33 442 33	240 363 49 150 30 5	50 50 66 50 100 66	120 182 32 75 30 3	144 418 41 121			802 145		400 138
										837		442	724	50	362	947		547
6.9	14B	64	5	Piling 500 lin. ft. @ $0.40 Timber 7.83 M.B.M. 43.64	Piling 300 lin. ft. @ $0.40 Timber 8.63 M.B.M. 43.00	As per Exhibit 1 Deduct:— Scrap rail 1.607 tons @ $14.00	23	23	200 342	60 50	120 171	120 371					

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A			1911			1912			1913		
									C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
									$		$	$		$	$		$
				Wrought iron 999 lbs		Track spikes 1.93 cwt. 2.10	4	3									
				Cast iron 289 lbs			27	26									
				Total — iron 1,288 lbs 0.035	Iron 995 lbs 0.035				45	80	36	35					
				Bridge ties (3.12 M.B.M.) 65 2.0875	Bridge ties 3.20 M.B.M. 34.00	Total as per Exhibit 1	750	421	136	50	68	109					
				Guard rail 1.0074 tons 14.00		Deduct	27	26	23	100	23				723		395
				Guard rail spikes 1.93 cwt. 2.10		Add timber 2.995 M.B.M. 43.64			4	80	3				131	95	124
									750		421	635	60	381	854		519
7.4	17B	112	9	Piling 900 lin. ft. @ $0.40	Piling 540 lin. ft. @ $0.40	As per Exhibit 1			360	50	180	216					
				Timber 12.70 M.B.M. 43.64	Timber 14.64 M.B.M. 43.00	Deduct:— Scrap rail 2.679 tons @ $14.00	38	38	554	50	277	630					
				Wrought iron 1,832 lbs		Track spikes 3.23 cwt. 2.10	7	4									
				Cast iron 514 lbs			45	42									
				Total — iron 2,346 lbs 0.035	Iron 1,760 lbs 0.035				82	50	41	62					
				Bridge ties (5.42 M.B.M.) 113 2.0875	Bridge ties 6.60 M.B.M. 34.00	Total as per Exhibit 1	1,277	658	236	50	118	224					
				Guard rail 2.679 tons 14.00		Deduct	45	42	38	100	38				1,232		616
				Guard rail spikes 3.23 cwt. 2.10		Add timber 5.242 M.B.M. 43.64			7	50	4				229	95	218
									1,277		658	1,132	40	453	1,461		834

9.6	26B	160	11	Piling 1,140 lin. ft. @ $0.40		Piling 1,375 lin. ft. @ $0.40		ORE:															
				Timber 18.90 M.B.M. 43.64		Timber 19.59 M.B.M. 43.00		As per Exhibit 1					456	60	274	550						
				Wrought iron 2,771 lbs				Deduct:—															
				Cast iron 1,075 lbs				Scrap rail 3.215 tons	$14.00	45		45	825	50	412	842						
				Total ——				Track spikes 4.06 cwt.	2.10	9		7											
				iron 3,846	0.035	Iron 2,200 lbs	0.035			54		52											
				Bridge ties (7.73 M.B.M.) 161	2.0875	Bridge ties 8.00 M.B.M.	34.00						135	80	108	77						
				Guard rail 3.2148 tons	14.00			Total as per Exhibit 1		1,806		1,014	336	50	168	272						
				Guard rail spikes 4.06 cwt.	2.10			Deduct		54		52	45	100	45				1,752		962
								Add timber 7.488 M.B.M.	43.64				9	80	7				237	95	311
													1,806		1,014	1,741	60	1,045	2,079		1,273
				HUMBOLDT TO REPUBLIC:																			
4.4	6C	16	2	Piling 132 lin. ft. @ $0.40		Piling 120 lin. ft. @ $0.40		Total as per Exhibit 1					53	52	28	48			221		116
				Timber 2.75 M.B.M. 43.64		Timber 3.16 M.B.M. 43.00							120	50	60	136						
				Wrought iron 306 lbs																			
				Cast ir. 68 lbs																			
				Total ——																			
				iron 376 lbs	0.035	Iron 400 lbs	0.035						13	76	10	14						
				Bridge ties (0.82 M.B.M.) 17	2.0875	Bridge ties 0.80 M.B.M.	34.00						35	50	18	27						
													221		116	225	50	113	221		116
5.2	10C	16	2	Piling 132 lin. ft. @ $0.40		Piling 120 lin. ft. @ $0.40		Total as per Exhibit 1					53	52	28	48			221		116
				Timber 2.75 M.B.M. 43.64		Timber 3.16 M.B.M. 43.00							120	50	60	136						
				Wrought iron 306 lbs																			
				Cast ir. 68 lbs																			
				Total ——																			
				iron 376 lbs	0.035	Iron 400 lbs	0.035						13	76	10	14						

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A			1911			1912			1913		
									C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
									$		$	$		$	$		$
				Bridge ties (0.82 M.B.M.)	Bridge ties												
				17 2.0875	0.80 M.B.M. 34.00				35	50	18	27					
									221		116	225	50	113	221		116
						Allocated 1913											
						Freight and Passenger									16,882		11,659
						Ore									2,079		1,273
				Total Marquette to Nestoria					17,752		11,652	17,096		10,256	18,961		12,932
				NESTORIA TO HOUGHTON:													
2.2	1D	191	16	Piling	Piling												
				1,820 lin. ft. @ $0.40	1,840 lin. ft. @ $0.40	As per Exhibit 1			728	72	524	736					
				Timber	Timber	Deduct:											
				30.59 M.B.M. 43.64	24.75 M.B.M. 43.00	Scrap rail											
				Wrought iron		4.286 tons @ $14.00	60	60	1,335	58	774	1,064					
				4,551 lbs		Track spikes											
				Cast iron		5.22 cwt. 2.10	11	9									
				1,641 lbs			71	69									
				Total ——													
				iron 6,196 lbs 0.035	Iron 3,090 lbs 0.035				216	86	186	108					
				Bridge ties (9.22 M.B.M.)	Bridge ties												
				192 0.0875	9.55 M.B.M. 34.00	Total as per Exhibit 1	2,751	1,786	401	58	233	325					
				Guard rail													
				4.2864 tons 14.00		Deduct	71	69	60	100	60				2,680		1,717
				Guard rail spikes		Add timber											
				5.22 2.10		8.939 M.B.M. 43.64			11	86	9				390	95	370
									2,751		1,786	2,233	70	1,563	3,070		2,087

2.4	2D	65	4	Piling 400 lin. ft. @ $0.40 Timber 9.42 M.B.M. 43.64 Wrought iron 1,243 lbs Cast iron 356 lbs Total iron 1,599 lbs 0.035 Bridge ties (3.17 M.B.M.) 66 2.0875 Guard rail 1.6074 tons 14.00 Guard rail spikes 1.93 cwt. 2.10	Piling 240 lin. ft. @ $0.40 Timber 8.18 M.B.M. 43.00 Iron 835 lbs 0.035 Bridge ties 3.25 M.B.M. 34.00	As per Exhibit 1 Deduct:— Scrap rail 1.607 tons @ $14.00 Track spikes 1.93 cwt. 2.10		23 4		23 3	160 411 56	68 52 84	109 214 47	96 352 29							
						Total as per Exhibit 1		27 792		26 468	138	52	72	112							
						Deduct Add timber 3.042 M.B.M. 43.64		27		26	23 4	100 84	23 3				765 133		442 126
											792		468	589	60	353	898		568
2.6	3D	41½	5	Piling 500 lin. ft. @ $0.40 Timber 4.56 M.B.M. @ 43.64 Wrought iron 772 lbs Cast ir. 212 lbs Total iron 984 lbs 0.035 Bridge ties (2.06 M.B.M.) 43 2.0875	Piling 500 lin. ft. @ $0.40 Timber 6.81 M.B. @ $43.00 Iron 945 lbs 0.035 Bridge ties 2.08 M.B.M. 34.00	Total as per Exhibit 1 Add timber 1.942 M.B.M. @ $43.64					200 199 34 90	68 52 84 52	136 103 29 47	200 293 33 71			523 85	95	315 81
									523		315	597	60	358	608		396
3.3	5D	41	4	Piling 400 lin. ft. @ $0.40 Timber 4.48 M.B.M. 43.64 Wrought iron 701 lbs Cast ir. 202 lbs Total iron 903 lbs 0.035 Bridge ties (2.02 M.B.M.) 42 2.0875	Piling 240 lin. ft. @ $0.40 Timber 6.24 M.B.M. 43.00 Iron 780 lbs 0.035 Bridge ties 2.05 M.B.M. 34.00	Total as per Exhibit 1 Add timber 1.942 M.B.M. 43.64					160 196 32 88	68 52 84 52	109 102 27 46	96 268 27 70			476 85	95	284 81
									476		284	461	60	277	561		365

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
							$		$	$		$	$		$
3.6	6D	40	4	Piling 400 lin. ft. @ $0.40 Timber 4.41 M.B.M. 43.64 Wrought iron 699 lbs Cast ir. 202 lbs Total — iron 901 lbs 0.035 Bridge ties (1.97 M.B.M.) 41 2.0875	Piling 240 lin. ft. @ $0.40 Timber 6.16 M.B.M. 43.00 Iron 780 lbs 0.035 Bridge ties 2.00 M.B.M. 34.00	Total as per Exhibit 1 Add timber 1.842 M.B.M. $43.64	160 192 31 86	68 52 84 52	109 100 26 45	96 265 27 68			469 82 31 86	95	280 78
							469		280	456	60	274	551		358
4.1	7D	40	4	Piling 400 lin. ft. @ $0.40 Timber 4.41 M.B.M. 43.64 Wrought iron 699 lbs Cast ir. 202 lbs Total — iron 901 lbs 0.035 Bridge ties (1.97 M.B.M.) 41 2.0875	Piling 240 lin. ft. @ $0.40 Timber 6.16 M.B.M. 43.00 Iron 780 lbs 0.035 Bridge ties 2.00 M.B.M. 34.00	Total as per Exhibit 1 Add timber 1.872 M.B.M. @ $43.64	160 192 31 86	68 52 84 52	109 100 26 45	96 265 27 68			469 82 31 86	95	280 78
							469		280	456	60	274	551		358
4.5	9D	42	4	Piling 400 lin. ft. @ $0.40 Timber 4.55 M.B.M. 43.64	Piling 240 lin. ft. @ $0.40 Timber 6.32 M.B.M. 43.00	Total as per Exhibit 1 Add timber 1.942 M.B.M. 43.64	160 199	68 52	109 103	96 272			481 85	95	286 81

				Wrought iron 703 lbs Cast ir. 202 lbs Total ——																				
				iron 905 lbs	0.035	Iron 780 lbs	0.035						32	84	27	27							
				Bridge ties (2.06 M.B.M.)		Bridge ties																		
				43	2.0875	2.10 M.B.M.	34.00						90	52	47	71							
													481		286	466	60	280	566		367		
5.1	12D	53	7	Piling 700 lin. ft. @	$0.40	Piling 700 lin. ft. @	$0.40	As per Exhibit 1					280	68	190	280							
								Deduct:—															
				Timber		Timber		Scrap rail															
				6.40 M.B.M.	43.64	9.61 M.B.M.	43.00	1.670 tons	@ $14.00	23		23	279	52	145	413							
				Wrought iron 1,097 lbs				Track spikes															
				Cast iron 188 lbs				1.90 cwt.	2.10	4		3											
				Total ——						27		26											
				iron 1,285 lbs	0.035	Iron 1,325 lbs	0.035						45	84	38	46							
				Bridge ties (3.07 M.B.M.)		Bridge ties																		
				64	2.0875	3.15 M.B.M.	34.00	Total as per Exhibit 1		765		469	134	52	70	107							
				Guard rail 1.6074 tons	14.00			Deduct		27		26	23	100	23					738		443		
				Guard rail spikes				Add timber															
				1.90 cwt.	2.10			2.995 M.B.M.	43.64				4	84	3					131	95	124		
													765		469	846	60	508	869		567		
8.7	17D	41	4	Piling 400 lin. ft. @	$0.40	Piling 240 lin. ft. @	$0.40	Total as per Exhibit 1					160	68	109	96				476		284		
				Timber		Timber		Add timber																
				4.48 M.B.M.	43.64	6.24 M.B.M.	43.00	1.942 M.B.M.	@ $43.64				196	52	102	268				85	95	81		
				Wrought iron 701 lbs Cast ir. 202 lbs Total ——																				
				iron 903 lbs	0.035	Iron 780 lbs	0.035						32	84	27	27							
				Bridge ties (2.02 M.B.M.)		Bridge ties																		
				42	2.0875	2.05 M.B.M.	34.00						88	52	46	70							
													476		284	461	60	277	561		365		

TRESTLES—Continued

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A			1911			1912			1913		
									C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
									$		$	$		$	$		$
9.2	18D	72	6	Piling 600 lin. ft. @ $0.40	Piling 360 lin. ft. @ $0.40	As per Exhibit 1			240	68	163	144					
				Timber	Timber	Deduct:—											
				8.31 M.B.M. 43.64	9.81 M.B.M. 43.00	Scrap rail											
				Wrought iron		2.143 tons @ $14.00	30	30	363	52	189	422					
				1,092 lbs		Track spikes											
				Cast iron		2.44 cwt. 2.10	5	4									
				301 lbs			35	34									
				Total ——													
				iron 1,393 lbs 0.035	Iron 1,180 lbs 0.035				49	84	41	41					
				Bridge ties (3.50 M.B.M.)	Bridge ties												
				73 2.0875	3.60 M.B.M. 34.00	Total as per Exhibit 1	839	506	152	52	79	122					
				Guard rail													
				2.1432 tons 14.00		Deduct	35	34	30	100	30				804		472
				Guard rail spikes		Add timber											
				2.44 cwt. 2.10		3.370 M.B.M. 43.64			5	84	4				146	95	139
									839		506	729	60	437	950		611
9.5	19D	46	5	Piling 500 lin. ft. @ $0.40	Piling 300 lin. ft. @ $0.40	Total as per Exhibit 1			200	68	136	120			576		344
				Timber	Timber	Add timber											
				5.50 M.B.M. 43.64	7.18 M.B.M. 43.00	2.153 M.B.M. @ $43.64			240	52	125	309			94	95	89
				Wrought ir. 941 lbs													
				Cast iron 154 lbs													
				Total ——													
				iron 1,095 lbs 0.035	Iron 955 lbs 0.035				38	84	32	33					
				Bridge ties (2.26 M.B.M.)	Bridge ties												
				47 2.0875	2.30 M.B.M. 34.00				98	52	51	78					
									576		344	540	60	324	670		433

14.1	23D	80	6	Piling 720 lin. ft. @ $0.40 Timber 9.91 M.B.M. 43.64 Wrought iron 1,475 lbs Cast iron 332 lbs Total —— iron 1,807 lbs 0.035 Bridge ties (3.89 M.B.M.) 81 2.0875 Guard rail 2.1432 tons 14.00 Guard rail spikes 2.51 cwt. 2.10	Piling 690 lin. ft. @ $0.40 Timber 10.46 M.B.M. 43.00 Iron 1,200 lbs 0.035 Bridge ties 4.00 M.B.M. 34.00	As per Exhibit 1 Deduct:— Scrap rail 2.143 tons 14.00 Track spikes 2.51 cwt. 2.10		30 5 35		30 4 34	288 432 64	68 52 84	196 225 54	276 450 42							
						Total as per Exhibit 1		988		597	169	52	88	136							
						Deduct		35		34	30	100	30					953		563
						Add timber 3.744 M.B.M. 43.64					5	84	4					163		155
											988		597	904	60	542		1,116		718
14.4	24D	32	3	Piling 300 lin. ft. @ $0.40 Timber 3.85 M.B.M. 43.64 Wrought iron 551 lbs Cast ir. 147 lbs Total —— iron 698 lbs 0.035 Bridge ties (1.58 M.B.M.) 33 2.0875		Total as per Exhibit 1 Add timber 1.498 M.B.M. $43.64					120 168 24 69	50 50 72 50	60 84 18 34						381 65	95	196 62
											381		196					446		258
14.6	25D	32	3		Piling 180 lin. ft. @ $0.40 Timber 4.98 M.B.M. 43.00 Iron 600 lbs 0.035 Bridge ties 1.60 M.B.M. 34.00								72 214 21 54							
														361	50	181				

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
							C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
							$		$	$		$	$		$
14.8	26D	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1	53	64	34	48			221		123
				Timber	Timber	Add timber									
				2.75 M.B.M. 43.64	3.16 M.B.M. 43.00	0.749 M.B.M. @ $43.64	120	50	60	136			33	95	31
				Wrought iron											
				308 lbs											
				Cast ir. 68 lbs											
				Total ——											
				iron 376 lbs 0.035	Iron 400 lbs 0.035		13	82	11	14					
				Bridge ties (0.82 M.B.M.)	Bridge ties										
				17 2.0875	0.80 M.B.M. 34.00		35	50	18	27					
							221		123	225	50	113	254		154
19.2	36D	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1	53	64	34	48			221		123
				Timber	Timber	Add timber									
				2.75 M.B.M. 43.64	3.16 M.B.M. 43.00	0.749 M.B.M. 43.64	120	50	60	136			33	95	31
				Wrought iron											
				308 lbs											
				Cast ir. 68 lbs											
				Total ——											
				iron 376 lbs 0.035	Iron 400 lbs 0.035		13	82	11	14					
				Bridge ties (0.82 M.B.M.)	Bridge ties										
				17 2.0875	0.80 M.B.M. 34.00		35	50	18	27					
							221		123	225	60	135	254		154
21.7	38D	17	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1	53	50	26	48			231		117
				Timber	Timber	Add timber									
				2.92 M.B.M. 43.64	3.24 M.B.M. 43.00	0.749 M.B.M. $ $43.64	127	50	64	139			33	95	31

				Wrought iron 308 lbs Cast ir. 68 lbs Total ——																			
				iron 376 lbs 0.035 Bridge ties (0.86 M.B.M.)		Iron 400 lbs 0.035 Bridge ties							13	62	8	14						
				18 2.0875		0.85 M.B.M. 34.00							38	50	19	29						
													231		117	230	50	115	264		148	
21.8	39D	20	2	Piling 132 lin. ft. @ $0.40 Timber		Piling 120 lin. ft. @ $0.40 Timber			Total as per Exhibit 1 Add timber				53	50	26	48			260		132	
				3.30 M.B.M. 43.64 Wrought iron 449 lbs Cast ir. 82 lbs Total ——		3.48 M.B.M. 43.00			0.936 M.B.M. 43.64				144	50	72	150			41	95	39	
				iron 531 lbs 0.035 Bridge ties (1.01 M.B.M.)		Iron 405 lbs 0.035 Bridge ties							19	62	12	14						
				21 2.0875		1.00 M.B.M. 34.00							44	50	22	34						
													260		132	246	50	123	301		171	
29.4	61D	63	6	Piling 480 lin. ft. @ $0.40 Timber		Piling 360 lin. ft. @ $0.40 Timber			As per Exhibit 1 Deduct:— Scrap rail				192	50	96	144						
				6.20 M.B.M. 43.64 Wrought iron 1,003 lbs Cast iron 286 lbs Total ——		9.08 M.B.M. 43.00			1.607 tons @ $14.00 Track spikes	23	23		271	50	136	390						
				iron 1,289 lbs 0.035 Bridge ties (3.07 M.B.M.)		Iron 1,160 lbs 0.035 Bridge ties			1.90 cwt. 2.10	4	3											
				64 2.0875 Guard rail		3.15 M.B.M. 34.00			Total as per Exhibit 1	27 669	26 358		45 134	74 50	33 67	41 107						
				1.6074 tons 14.00 Guard rail spikes					Deduct Add timber	27	26		23	100	23				642		332	
				1.90 cwt. 2.10					2.995 M.B.M. 43.64				4	74	3				131	95	124	
													669		358	682	50	341	773		456	

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
							$		$	$		$	$		$
33.4	65D	39	4	Piling 400 lin. ft. @ $0.40 Timber 4.41 M.B.M. 43.64 Wrought iron 697 lbs Cast ir. 202 lbs Total —— iron 899 lbs 0.035 Bridge ties (1.92 M.B.M.) 40 2.0875	Piling 240 lin. ft. @ $0.40 Timber 6.08 M.B.M. 43.00 Iron 775 lbs 0.035 Bridge ties 1.95 M.B.M. 34.00	Total as per Exhibit 1 Add timber 1.872 M.B.M. 43.64	160 192 31 83	50 50 72 50	80 96 22 42	96 261 27 66			466 82 548	95	240 78 318
							466		240	450	50	225			
34.0	66D	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 308 lbs Cast ir. 68 lbs Total —— iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875	Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00 Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00	Total as per Exhibit 1 Add timber 0.749 M.B.M. @ $43.64	53 120 13 35	50 50 74 50	26 60 9 18	48 136 14 27			221 33 254	95	113 31 144
							221		113	225	50	113			
34.3	67D	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 308 lbs	Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00	Total as per Exhibit 1 Add timber 0.749 M.B.M. 43.64	53 120	50 50	26 60	48 136			221 33	95	113 31

				Cast ir. 68 lbs Total ——																				
				iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.)			Iron 400 lbs 0.035 Bridge ties						13	74	9	14					
				17 2.0875			0.80 M.B.M. 34.00						35	50	18	27					
													221		113	225	50	113	254		144
34.5	68D	16	2	Piling 132 lin. ft. @ $0.40 Timber			Piling 120 lin. ft. @ $0.40 Timber			Total as per Exhibit 1 Add timber			53	50	26	48			221		113
				2.75 M.B.M. 43.64 Wrought iron			3.16 M.B.M. 43.00			0.749 M.B.M. @ $43.64			120	50	60	136			33	95	31
				308 lbs Cast ir. 68 lbs Total ——																	
				iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.)			Iron 400 lbs 0.035 Bridge ties						13	74	9	14					
				17 2.0875			0.80 M.B.M. 34.00						35	50	18	27					
													221		113	225	50	113	254		144
34.8	69D	16	2	Piling 132 lin. ft. @ $0.40 Timber			Piling 120 lin. ft. @ $0.40 Timber			Total as per Exhibit 1 Add timber			53	50	26	48			221		113
				2.75 M.B.M. 43.64 Wrought iron			3.16 M.B.M. 43.00			0.749 M.B.M. @ $43.64			120	50	60	136			33	95	31
				308 lbs Cast ir. 68 lbs Total ——																	
				iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.)			Iron 400 lbs 0.035 Bridge ties						13	72	9	14					
				17 2.0875			0.80 M.B.M. 34.00						35	50	18	27					
													221		113	225	50	113	254		144
35.2	70[illegible]	16	2	Piling 132 lin. ft. @ $0.40 Timber			Piling 120 lin. ft. @ $0.40 Timber			Total as per Exhibit 1 Add timber			53	50	26	48			221		113
				2.75 M.B.M. 43.64 Wrought iron			3.16 M.B.M. 43.00			0.749 $43.64			120	50	60	136			33	95	31
				308 lbs																	

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
							C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
							$		$	$		$	$		$
				Cast ir. 68 lbs											
				Total ——											
				iron 376 lbs 0.035	Iron 400 lbs 0.035		13	72	9	14					
				Bridge ties (0.82 M.B.M.)	Bridge ties										
				17 2.0875	0.80 M.B.M. 34.00		35	50	18	27					
							221		113	225	50	113	254		144
35.4	71D	32	3	Piling 300 lin. ft. @ $0.40	Piling 180 lin. ft. @ $0.40	Total as per Exhibit 1	120	50	60	72			381		196
				Timber	Timber	Add timber									
				3.85 M.B.M. 43.64	5.00 M.B.M. 43.00	1.498 M.B.M. @ $43.64	168	50	84	215			65	95	62
				Wrought iron											
				551 lbs											
				Cast ir. 147 lbs											
				Total ——											
				iron 698 lbs 0.035	Iron 600 lbs 0.035		24	72	18	21					
				Bridge ties (1.58 M.B.M.)	Bridge ties										
				33 2.0875	1.60 M.B.M. 34.00		69	50	34	54					
							381		196	362	50	181	446		258
35.7	72D	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1	53	50	26	48			221		113
				Timber	Timber	Add timber									
				2.75 M.B.M. 43.64	3.16 M.B.M. 43.00	0.749 M.B.M. 43.64	120	50	60	136			33	95	31
				Wrought iron											
				308 lbs											
				Cast ir. 68 lbs											
				Total ——											
				iron 376 lbs 0.035	Iron 400 lbs 0.035		13	72	9	14					
				Bridge ties (0.82 M.B.M.)	Bridge ties										
				17 2.0875	0.80 M.B.M. 34.00		35	50	18	27					
							221		113	225	50	113	254		144

| | | |

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 14A	1911			1912			1913		
							C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
							$		$	$		$	$		$
						Rail stringers 3.15 tons 20.00							63	90	57
						Steel plates 0.28 tons 65.00							18	90	16
							951		572	1,048	70	734	1,159		728
36.8	76D	115	23	Piling 1,840 lin. ft. @ $0.40	Piling 1,380 lin. ft. @ $0.40	Piling 3,450 lin. ft. @ $0.40	736	50	368	552			1,380	50	690
				Timber 1.302 M.B.M. 43.64	Timbe 22.30 M.B.M. 43.00	Timber 3.864 M.B.M. 43.64	568	50	284	959			168	50	84
				Wrought iron 2,590 lbs Cast ir. 658 lbs Total —— iron 3,248 lbs 0.035		Wrought iron 1,179 lbs 0.035							41	70	29
				Bridge ties (5.57 M.B.M.) 116 2.0875	Iron 4,080 lbs 0.035 Bridge ties 5.75 M.B.M. 34.00	Bridge ties (5.57 M.B.M.) 116 2.0875	114	70	80	143					
				Guard rail 2.6787 tons 14.00			242	50	121	196			242	50	121
				Guard rail spikes 3.25 cwt. 2.10			38	100	38						
							7	70	5						
						Rail stringers 6.9 tons 20.00							138	90	124
						Steel plates 0.46 tons 65.00							30	90	27
							1,705		896	1,850	50	925	1,999		1,075
36.9	77D	56½	15	Piling 1,200 lin. ft. @ $0.40	Piling 900 lin. ft. @ 0$.40	Piling 2,250 lin. ft. @ $0.40	480	50	240	360			900	50	450

				Timber 7.29 M.B.M. 43.64 Wrought iron 1,584 lbs Cast ir. 405 lbs Total ——			Timber 13.33 M.B.M. 43.00			Timber 2.52 M.B.M. 43.00 Wrought iron 663 lbs 0.035			318	50	159	573			110	50	55
																			23	72	15
				iron 1,989 lbs		0.035	Iron 2,630 lbs		0.035				69	72	50	92					
				Bridge ties (2.78 M.B.M.) 58		2.0875	Bridge ties 2.83 M.B.M.		34.00	Bridge ties (2.78 M.B.M.) 58		2.0875	121	50	60	96			121	50	61
				Guard rail 1.6074		14.00							23	100	23						
				Guard rail spikes 1.86 cwt.		2.10							4	72	3						
										Rail stringers 3.390 tons		20.00							68	90	61
										Steel plates 0.30 tons		65.00							20	90	18
													1,015		535	1,121	50	561	1,242		660
37.1	78D	56	15	Piling 1,200 lin. ft. @		$0.40	Piling 900 lin. ft. @		$0.40	Piling 2,250 lin. ft. @		$0.40	480	50	240	360			900	50	450
				Timber 7.29 M.B.M.		43.64	Timber 13.29 M.B.M.		43.00	Timber 2.52 M.B.M. @		$43.64	318	50	159	571			110	50	55
				Wrought iron 1,584 lbs Cast iron 405 lbs Total ——						Wrought iron 663 lbs		0.035							23	72	15
				iron 1,989 lbs		0.035	Iron 2,630 lbs		0.035				69	72	50	92					
				Bridge ties (2.74 M.B.M.) 57		2.0875	Bridge ties 2.80 M.B.M.		34.00	Bridge ties (2.78 M.B.M.) 58		2.0875	119	50	60	95			121	50	61
				Guard rail 1.6074 tons		14.00							23	100	23						
				Guard rail spikes 1.86 cwt.		2.10							4	72	3						
										Rail stringers 3.36 tons		20.00							67	90	60
										Steel plates 0.03 tons		65.00							20	90	18
													1,013		535	1,118	50	559	1,241		659

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
							$		$	$		$	$		$
37.2	79D	56	15	Piling 1,200 lin. ft. @ $0.40 Timber 7.29 M.B.M. 43.64 Wrought iron 1,584 lbs Cast ir. 405 lbs Total — iron 1,989 lbs 0.035 Bridge ties (2.74 M.B.M) 57 2.0875 Guard rail 1.6074 tons 14.00 Guard rail spikes 1.86 cwt. 2.10	Piling 900 lin. ft. @ $0.40 Timber 13.29 M.B.M. 43.00 Iron 2,630 lbs 0.035 Bridge ties 2.80 M.B.M. 34.00	Piling 2,250 lin. ft. @ $0.40 Timber 2.52 M.B.M. 43.64 Wrought iron 663 lbs 0.035 Bridge ties (2.78 M.B.M.) 58 2.0875 Rail stringers 3.36 tons 20.00 Steel plates 0.03 tons 65.00	480 318 69 119 23 4	50 50 70 50 100 70	240 159 48 60 23 3	360 571 92 95			900 110 23 121 67 20	50 50 72 50 90 90	450 55 15 61 60 18
							1,013		533	1,118	50	559	1,241		650
37.3	80D	56	15	Piling 1,200 lin. ft. @ $0.40 Timber 7.29 M.B.M. 43.64 Wrought iron 1,584 lbs Cast ir. 405 lbs Total — iron 1,989 lbs 0.035 Bridge ties (2.74 M.B.M.) 57 2.0875	Piling 900 lin. ft. @ $0.40 Timber 13.29 M.B.M. 43.00 Iron 2,630 lbs 0.035 Bridge ties 2.80 M.B.M. 34.00	Piling 2,250 lin. ft. @$0.40 Timber 2.52 M.B.M. 43.64 Wrought iron 663 lbs 0.035 Bridge ties (2.78 M.B.M.) 58 2.0875	480 318 69 119	50 50 72 50	240 159 50 60	360 571 92 95			900 110 23 121	50 50 72 50	450 55 15 61

				Guard rails 1.6074 tons 14.00 Guard rail spikes 1.86 cwt. 2.10									23	100	23						
													4	72	3						
												Rail stringers 3.36 tons 20.00							67	90	60
												Steel plates 0.30 tons 65.00							20	90	18
													1,013		535	1,118	50	559	1,241		659
37.4	81D	53	14	Piling 1,120 lin. ft. @ $0.40 Timber 6.85 M.B.M. 43.64 Wrought iron 1,467 lbs Cast ir. 368 lbs Total —— iron 1,835 lbs 0.035 Bridge ties (2.59 M.B.M.) 54 2.0875 Guard rail 1.6074 tons 14.00 Guard rail spikes 1.83 cwt. 2.10			Piling 840 lin. ft. @ 0.40 Timber 12.51 M.B.M. 43.00 Iron 2,455 lbs 0.035 Bridge ties 2.65 M.B.M. 34.00			Piling 2,100 lin. ft. @ $0.40 Timber 2.352 M.B.M. 43.64 Wrought iron 618 lbs 0.035 Bridge ties (2.59 M.B.M.) 54 2.0875 Rail stringers 3.18 tons 20.00 Steel plates 0.280 tons 65.00			448 299 64 113 23 4 951	50 50 70 50 100 70	224 150 45 56 23 3 501	336 538 86 90 1,050	50	525	840 103 22 113 64 18 1,160	50 50 72 50 90 90	420 52 16 56 58 16 618
37.7	82D	52	14	Piling 1,120 lin. ft. @ $0.40 Timber 6.85 M.B.M. 43.64 Wrought iron 1,467 lbs Cast ir. 368 lbs Total —— iron 1,835 lbs 0.035 Bridge ties (2.54 M.B.M.) 53 2.0875			Piling 840 lin. ft. @ $0.40 Timber 12.43 M.B.M. 43.00 Iron 2,455 lbs 0.035 Bridge ties 2.60 M.B.M. 34.00			Piling 2,100 lin. ft. @ $0.40 Timber 2.352 M.B.M. 43.64 Wrought iron 612 lbs 0.035 Bridge ties (2.54 M.B.M.) 53 2.0875			448 299 64 111	50 50 70 50	224 150 45 56	336 534 86 88			840 103 21 111	50 50 72 50	420 52 15 56

TRESTLES—Continued

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
							C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
							$		$	$		$	$		$
				Guard rail 1.6074 tons 14.00 Guard rail spikes 1.83 tons 2.10			23	100	23						
							4	70	3						
						Rail stringers 3.12 tons 20.00							62	90	56
						Steel plates 0.28 tons 65.00							18	90	16
							949		501	1,044	50	522	1,145		615
37.8	83D	54	14	Piling 1,120 lin. ft. @ $0.40 Timber 6.92 M.B.M. 43.64 Wrought iron 1,467 lbs Cast ir. 368 lbs Total —— iron 1,835 lbs 0.035 Bridge ties (2.64 M.B.M.) 55 2.0875 Guard rail 1.6074 tons 14.00 Guard rail spikes 1.83 cwt. 2.10	Piling 840 lin. ft. @ $0.40 Timber 12.59 M.B.M. 43.00 Iron 2,460 lbs 0.035 Bridge ties 2.70 M.B.M. 34.00	Piling 2,100 lin. ft. @ $0.40 Timber 2.352 M.B.M. 43.64 Wrought iron 624 lbs 0.035 Bridge ties (2.64 M.B.M.) 55 2.0875 Rail stringers 3.24 tons 20.00 Steel plates 0.28 tons 65.00	448	50	224	336			840	50	420
							302	50	151	541			103	50	52
													22	72	16
							64	70	45	86					
							115	50	58	92			115	50	58
							23	100	23						
							4	70	3						
													65	90	58
													18	90	16
							956		504	1,055	50	528	1,163		620

37.9	84D	56	15	Piling 1,200 lin. ft. @ $0.40 Timber 7.29 M.B.M. 43.64 Wrought iron 1,584 lbs Cast ir. 405 lbs Total —— iron 1,989 lbs 0.035 Bridge ties (2.74 M.B.M.) 57 2.0875 Guard rail 1.6074 tons 14.00 Guard rail spikes 1.86 cwt. 2.10	Piling 900 lin. ft. @ $0.40 Timber 13.29 M.B.M. 43.00 Iron 2,630 lbs 0.035 Bridge ties 2.80 M.B.M. 34.00	Piling 2,250 lin. ft. @ $0.40 Timber 2.52 M.B.M. 43.64 Wrought iron 663 lbs 0.035 Bridge ties (2.78 M.B.M.) 58 2.0875 Rail stringers 3.36 tons 20.00 Steel plates 0.30 tons 65.00				480 318 69 119 23 4 1,013	50 50 70 50 100 70	240 159 48 60 23 3 533	360 571 92 95 1,118	50	559	900 110 23 121 67 20 1,241	50 72 50 90 90	450 55 15 61 60 18 659
37.9	85D	57	15	Piling 1,200 lin. ft. @ $0.40 Timber 7.36 M.B.M. 43.64 Wrought iron 1,586 lbs Cast ir. 405 lbs Total —— iron 1,991 lbs 0.035 Bridge ties (2.78 M.B.M.) 58 2.0875 Guard rail 1.6074 tons 14.00 Guard rail spikes 1.88 cwt. 2.10	Piling 900 lin. ft. @ $0.40 Timber 13.37 M.B.M. 43.00 Iron 2,630 lbs 0.035 Bridge ties 2.85 M.B.M. 34.00	Piling 2,250 lin. ft. @ $0.40 Timber 2.52 M.B.M. 43.64 Wrought iron 663 lbs 0.035 Bridge ties (2.78 M.B.M.) 58 2.0775 Rail stringers 3.42 tons 20.00 Steel plates 0.03 tons 65.00				480 321 70 121 23 4 1,019	50 50 70 50 100 70	240 160 49 60 23 3 535	360 575 92 97 1,124	50	562	900 110 23 121 68 20 1,242	50 72 50 90 90	450 55 15 61 61 18 660

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
							$		$	$		$	$		$
38.1	86D	57	15	Piling 1,200 lin. ft. @ $0.40 Timber 7.36 M.B.M. 43.64 Wrought iron 1,586 lbs Cast ir. 405 lbs Total —— iron 1,991 lbs 0.035 Bridge ties (2.78 M.B.M.) 58 2.0875 Guard rail 1.6074 tons 14.00 Guard rail spikes 1.88 cwt. 2.10	Piling 900 lin. ft. @ $0.40 Timber 13.37 M.B.M. 43.00 Iron 2,630 lbs 0.035 Bridge ties 2.85 M.B.M. 34.00	Piling 2,250 lin. ft. @ $0.40 Timber 2.52 M.B.M. 43.64 Wrought iron 663 lbs 0.035 Bridge ties (2.78 M.B.M.) 58 2.0875 Rail stringers 3.42 tons 20.00 Steel plates 0.30 tons 65.00	480 321 70 121 23 4	50 50 70 50 100 70	240 160 49 60 23 3	360 575 92 97 			900 110 23 121 68 20	50 50 72 50 90 90	450 55 15 61 61 18
							1,019		535	1,124	50	562	1,242		660
38.2	87D	57	16	Piling 1,280 lin. ft. @ $0.40 Timber 7.52 M.B.M. 43.64 Wrought iron 1,628 lbs Cast ir. 415 lbs Total —— iron 2,043 lbs 0.035 Bridge ties (2.78 M.B.M.) 58 2.0875	Piling 900 lin. ft. @ $0.40 Timber 13.90 M.B.M. 43.00 Iron 2,795 lbs 0.035 Bridge ties 2.85 M.B.M. 34.00	Piling 2,250 lin. ft. @ $0.40 Timber 2.52 M.B.M. 43.64 Wrought iron 663 lbs 0.035 Bridge ties (2.78 M.B.M.) 58 2.0875	512 328 72 121	64 50 82 50	328 164 59 60	384 598 98 97			900 110 23 121	64 50 82 50	576 55 19 61

				Guard rail 1.6074 tons 14.00 Guard rail spikes 1.88 cwt. 2.10									23	100	23							
													4	82	3							
												Rail stringers 3.42 tons 20.00								68	90	61
												Steel plates 0.03 tons 65.00								20	90	18
													1,060		637	1,177	60	706	1,242		790
38.3	88D	60½	13	Piling 1,040 lin. ft. @ $0.40 Timber 6.49 M.B.M. 43.64 Wrought iron 1,443 lbs Cast ir. 356 lbs Total ——		Piling 780 lin. ft. @ $0.40 Timber 12.59 M.B.M. 43.00						16 bents Piling 2,400 lin. ft. @ $0.40 Timber 2.688 M.B.M. 43.64 Wrought iron 708 lbs 0.035		416	50	208	312			960	50	480
													283	50	142	541			117	50	58
																			25	50	12
				iron 1,799 lbs 0.035 Bridge ties (2.98 M.B.M.)		Iron 2,305 lbs 0.035 Bridge ties							62	70	43	81					
				62 2.0875 Guard rail 1.6074 tons 14.00 Guard rail spikes 1.90 cwt. 2.10		3.03 M.B.M. 34.00						Bridge ties (2.98 M.B.M.) 62 2.0875 Rail stringers 3.63 tons 20.00 Steel plates 0.32 tons 65.00	129	50	64	103			129	50	64
													23	100	23						
													4	70	3						
																			73	90	66
																			21	90	19
													917		483	1,037	50	519	1,325		699
38.4	89D	57	15	Piling 1,200 lin. ft. @ $0.40 Timber 7.36 M.B.M. 43.64 Wrought iron 1,586 lbs Cast ir. 405 lbs Total ——		Piling 900 lin. ft. @ $0.40 Timber 13.37 M.B.M. 43.00						Piling 2,250 lin. ft. @ $0.40 Timber 2.52 M.B.M. 43.64 Wrought iron 663 lbs 0.035	480	50	240	360			900	50	450
													321	50	160	575			110	50	55
																			23	72	15
				iron 1,991 lbs 0.035		Iron 2,630 lbs 0.035							70	58	40	92					

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
							$		$	$		$	$		$
				Bridge ties (2.78 M.B.M.) 58 2.0875	Bridge ties 2.85 M.B.M. 34.00	Bridge ties (2.78 M.B.M.) 58 2.0875	121	50	60	97			121	50	61
				Guard rail 1.7074 tons 14.00			23	100	23						
				Guard rail spikes 1.88 cwt. 2.10			4	58	2						
						Rail stringers 3.42 tons 20.00							68	90	61
						Steel plates 0.30 tons 65.00							20	90	18
							1,019		525	1,124	50	562	1,242		660
38.6	90D	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1	53	50	26	48			221		113
				Timber 2.75 M.B.M. 43.64	Timber 3.16 M.B.M. 43.00	Add timber 0.749 M.B.M. @ $43.64	120	50	60	136			33	95	31
				Wrought iron 308 lbs											
				Cast ir. 68 lbs											
				Total —— iron 376 lbs 0.035	Iron 400 lbs 0.035		13	72	9	14					
				Bridge ties (0.82 M.B.M.) 17 2.0875	Bridge ties 0.87 M.B.M. 34.00		35	50	18	27					
							221		113	225	50	113	254		144
38.7	91D	58½	15	Piling 1,200 lin. ft. @ $0.40	Piling 900 lin. ft. @ $0.40	Piling 2,250 lin. ft. @ $0.40	480	50	240	360			900	50	450
				Timber 7.39 M.B.M. 43.64	Timber 13.49 M.B.M. 43.00	Timber 2.52 M.B.M. 43.64	322	50	161	580			110	50	55
				Wrought iron 1,590 lbs		Wrought iron 675 lbs 0.035							24	70	17

				Cast ir. 405 lbs Total —— iron 1,995 lbs 0.035 Bridge ties (2.88 M.B.M.) 60 2.0875 Guard rails 1.6074 tons 14.00 Guard rail spikes 1.88 cwt. 2.10		Iron 2,361.5 lbs 0.035 Bridge ties 2.93 M.B.M. 34.00			Bridge ties (2.88 M.B.M.) 60 2.0875 Rail stringers 3.51 tons 20.00 Steel plates 0.30 tons 65.00				70	70	49	92					
															125	50	62	100			125	50	62
															23	100	23						
															4	70	3						
																					70	90	63
																					20	90	18
															1,024		538	1,132	50	566	1,249		665
38.8	92D	16	2	Piling 132 lin. ft. @ $0.40 Timber 2.75 M.B.M. 43.64 Wrought iron 308 lbs Cast ir. 68 lbs Total —— iron 376 lbs 0.035 Bridge ties (0.82 M.B.M.) 17 2.0875		Piling 120 lin. ft. @ $0.40 Timber 3.16 M.B.M. 43.00 Iron 400 lbs 0.035 Bridge ties 0.80 M.B.M. 34.00			Total as per Exhibit 1 Add timber 0.749 M.B.M. 43.64				53	50	26	48			221		113
															120	50	60	136			33	95	31
															13	72	9	14					
															35	50	18	27					
															221		113	225	50	113	254		144
38.9	93D	32	3	Piling 300 lin. ft. @ $0.40 Timber 3.85 M.B.M. 43.64 Wrought iron 551 lbs Cast ir. 147 lbs Total —— iron 698 lbs 0.035 Bridge ties (1.58 M.B.M.) 33 2.0875		Piling 180 lin. ft. @ $0.40 Timber 4.98 M.B.M. 43.00 Iron 400 lbs 0.035 Bridge ties 1.60 M.B.M. 34.00			Total as per Exhibit 1 Add timber 1.498 M.B.M. @ $43.64				120	50	60	72			381		195
															168	50	84	214			65	95	62
															24	70	17	14					
															69	50	34	54					
															381		195	354	50	177	446		257

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A			1911			1912			1913		
									C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
									$		$	$		$	$		$
39.0	94D	207	14	See Bridges	Piling 2,100 lin. ft. @ $0.40	See Bridges						840					
					Timber 25.00 M.B.M. 43.00							1,075					
					Iron 2,765 lbs 0.035							97					
					Bridge ties 10.35 M.B.M. 34.00							352					
												2 364,	50	1,182			
45.8	101D	94	7	Piling 860 lin. ft. @ $0.40	Piling 875 lin. ft. @ $0.40	As per Exhibit 1			344	50	172	350					
						Deduct:—											
				Timber 13.97 M.B.M. 43.64	Timber 12.12 M.B.M. 43.00	Scrap rail 2.143 tons @ $14.00	30	30	610	50	305	521					
				Wrought iron 2,398 lbs		Track spikes 2.63 cwt. 2.10	6	4									
				Cast iron 1,180 lbs			36	34									
				Total iron 3,578 lbs 0.035	Iron 1,390 lbs 0.035				125	74	92	49					
				Bridge ties (4.56 M.B.M.) 95 2.0875	Bridge ties 4.70 M.B.M. 34.00	Total as per Exhibit 1	1,313	702	198	50	99	160					
				Guard rail 2.1432 tons 14.00		Deduct	36	34	30	100	30				1,277		668
				Guard rail spikes 2.62 cwt. 2.10		Add timber 4.399 M.B.M. 43.64			6	74	4				192	95	182
									1,313		702	1,080	50	540	1,469		850
					Total Nestoria to Houghton				32,976		18,309	35,925		19,418	39,086		22,753
					Total Marquette to Nestoria				17,752		11,652	17,096		10,256	18,961		12,932
				Total Marquette to Houghton					50,728		29,961	53,021		29,674	58047		35,685

				NESTORIA TO STATE LINE																					
202.1	291	64	5	Piling 500 lin. ft. @ $0.40	Piling 500 lin. ft. @ $0.40	As per Exhibit 1			200	50	100	200													
						Deduct:—																			
				Timber 7.83 M.B.M. 43.64	Timber 8.63 M.B.M. 43.00	Scrap rails 1.607 tons @ $14.00	22	22	342	50	171	371													
				Wrought iron 999 lbs		Track spikes 1.92 cwt. 2.10	4	3																	
				Cast iron 289 lbs			26	25																	
				Total — iron 1,288 lbs 0.035	Iron 1,000 lbs 0.035				45	72	32														
				Bridge ties (3.12 M.B.M.) 65 2.0875	Bridge ties 3.20 M.B.M. 34.00	Total as per Exhibit 1	749	396	136	50	68	109													
				Guard rail 1.6074 tons 14.00		Deduct	26	25	22	100	22	35									723		371		
				Guard rail spikes 1.92 cwt. 2.10		Add timber 2.995 M.B.M. 43.64			4	72	3										131	95	134		
									749		396	715	50	358	854		495								
204.5	293	96	7	Piling 980 lin. ft. @ $0.40	Piling 945 lin. ft. @ $0.40	As per Exhibit 1			392	50	196	378													
						Deduct:—																			
				Timber 13.97 M.B.M. 43.64	Timber 12.29 M.B.M. 43.00	Scrap rail 2.143 tons @ $14.00	30	30	610	50	305	528													
				Wrought iron 2,402 lbs		Track spikes 2.62 cwt. 2.10	6	4																	
				Cast iron 1,180 lbs			36	34																	
				Total — iron 3,582 lbs 0.035	Iron 1,400 lbs 0.035				125	74	92	49													
				Bridge ties (4.66 M.B.M.) 97 2.0875	Bridge ties 4.80 M.B.M. 34.00	Total as per Exhibit 1	1,365	728	202	50	101	163													
				Guard rail 2.1432 tons 14.00		Deduct	36	34	30	100	30										1,329		694		
				Guard rail spikes 2.62 cwt. 2.10		Add timber 4.493 43.64			6	74	4										196	95	186		
									1,365		728	1,118	50	559	1,525		880								
205.8	295	112	8	Piling 1,120 lin. ft. @ $0.40	Piling 480 lin. ft. @ $0.40	Included in Bridge Schedule. Trestle replaced by bridge in 1912-13.			448	50	224	192													

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A			1911			1912			1913		
									C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
	Spruce River			Timber	Timber				$		$	$		$	$		$
				13.86 M.B.M. 43.64	14.11 M.B.M. 43.00				605	50	302	607					
				Wrought iron													
				2,004 lbs													
				Cast ir. 674 lbs													
				Total ——													
				iron 2,678 lbs 0.035	Iron 1,700 lbs 0.035				94	66	62	60					
				Bridge ties (5.42 M.B.M.)	Bridge ties												
				113 2.0875	5.60 M.B.M. 34.00				236	50	118	190					
				Guard rail													
				2.679 tons 14.00					38	100	38						
				Guard rail spikes													
				3.24 cwt. 2.10					7	66	5						
									1,428		749	1,049	50	525			
211.5	298	217	15	Piling	Piling												
				1,800 lin. ft. @ $0.40	1,500 lin. ft. @ $0.40	As per Exhibit 1			720	50	360	600					
						Deduct:—											
				Timber	Timber	Scrap rail											
				35.36 M.B.M. 43.64	21.33 M.B.M. 43.00	4.286 Tons @ $14.00	60	60	1,543	50	772	917					
				Wrought iron		Track spikes											
				5,804 lbs		5.34 cwt. 2.10	11	8									
				Cast iron													
				1,734 lbs			71	68									
				Total ——													
				iron 7,538 lbs 0.035	Iron 2,980 lbs 0.035				264	70	184	104					
				Bridge ties (10.46 M.B.M.)	Bridge ties												
				218 2.0875	10.85 M.B.M. 34.00	Total as per Exhibit 1	3,053	1,612	455	50	228	369					
				Guard rail													
				4.2864 tons 14.00		Deduct	71	68	60	100	60				2,982		1,544
				Guard rail spikes		Add timber											
				5.34 cwt. 2.10		10.156 M.B.M. 43.64			11	70	8				443	95	421
									3,053		1,612	1,990	50	995	3,425		1,965

213.1	299	79	6	Piling 720 lin. ft. @ $0.40 Timber 9.91 M.B.M. 43.64 Wrought iron 1,473 lbs Cast iron 332 lbs Total — iron 1,805 tons 0.035 Bridge ties (3.84 M.B.M.) 80 2.0875 Guard rail 2.1432 tons Guard rail spikes 2.51 cwt.	Piling 600 lin. ft. @ $0.40 Timber 10.38 M.B.M. 43.00 Iron 1,200 lbs 0.035 Bridge ties 3.95 M.B.M. 34.00	As per Exhibit 1 Deduct:— Scrap rail 2.143 tons 14.00 Track spikes 2.51 cwt. 2.10 Total as per Exhibit 1 Deduct Add timber 3.697 M.B.M. 43.64	30 5 35 986 35		30 4 34 596 34	288 432 64 167 30 5	68 52 84 52 100 84	196 225 54 87 30 4	240 446 42 134			951 161	95	562 153
									986		596	862	65	580	1,112		715
218.5	300	63	5	Piling 400 lin. ft. @ $0.40 Timber 8.53 M.B.M. 43.64 Wrought iron 1,035 lbs Cast iron 204 lbs Total — iron 1,239 lbs 0.035 Bridge ties (3.07 M.B.M.) 64 2.0875 Guard rail 1.6074 tons 14.00 Guard rail spikes 1.89 cwt. 2.10	Piling 300 lin. ft. @ $0.40 Timber 8.55 M.B.M. 43.00 Iron 1,000 lbs 0.035 Bridge ties 3.15 M.B.M. 34.00	As per Exhibit 1 Deduct:— Scrap rail 1.607 tons @ $14.00 Track spikes 1.89 cwt. 2.10 Total as per Exhibit 1 Deduct Add timber 2.995 M.B.M.	22 4 26 776 26		22 3 25 408 25	200 373 43 134 22 4	50 50 70 50 100 70	100 186 30 67 22 3	120 368 35 107	50		750 131		383 124
									776		408	630		315	881		507
221.6	302 Perch	456½ River	29	Piling 4,520 lin. ft. @ $0.40 Timber 67.86 M.B.M. 43.64	Piling 1,740 lin. ft. @ $0.40 Timber 87.28 M.B.M. 38.00	See Culverts				1,808 2,961	50 50	904 1,480	696 3,316					

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hanzel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
							C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
							$		$	$		$	$		$
				Wrought iron 10,899 lbs Cast iron 3,786 lbs Total ——											
				iron 14,685 lbs 0.035	Iron 5,644 lbs 0.035		514	72	370	194					
				Scrap rail 0.3870 tons 14.00			5	100	5						
				Bridge ties (22.03 M.B.M.) 459 2.0875	Bridge ties 22.83 M.B.M. 34.00		958	50	479	776					
				Guard rail 8.5728 tons 14.00			120	100	120						
				Guard rail spikes 11.05 cwt. 2.10			23	72	17						
224.9	304	204	14	Piling 1,920 lin. ft. @ $0.40	Omitted	See Culverts	6,389		3,375	4,982	50	2,491			
				Timber 30.40 M.B.M. 43.64			768	50	384						
				Wrought iron 4,555 lbs Cast iron 1,882 lbs Total ——			1,327	50	664						
				iron 6,437 lbs 0.035			225	70	157						
				Bridge ties (9.84 M.B.M.) 205 2.0875			428	50	214						
				Guard rail 4.2864 tons 14.00			60	100	60						
				Guard rail spikes 5.32 cwt. 2.10			11	70	8						
							2,819		1,487						

234.9	309	625½	39	Piling 3,490 lin. ft. @ $0.40			Piling 3,510 lin. ft. @ $0.40			As per Exhibit 1 Deduct:—				1,396	50	698	1,404							
				Timber 22.947 M.B.M. 43.64			Timber 237.87 M.B.M. 38.00			Scrap rail 11.788 tons @ $14.00	165		165	10,014	50	5,007	9,039							
	Jumbo Creek			Wrought iron 21,552 lbs Cast iron 8,022 lbs Total ——						Track spikes 15.08 cwt. 2.10	32		22											
											197		187											
				iron 29,574 lbs	0.035		Iron 10,736 lbs	0.035						-1,035	70	725	376							
				Bridge ties (30.10 M.B.M.) 627	2.0875		Bridge ties 31.28 M.B.M.	34.00		Total as per Exhibit 1	13,951		7,271	1,309	50	654	1,063							
				Guard rail 11.7876 tons	14.00					Deduct	197		187	165	100	165				13,754		7,084		
				Guard rail spikes 15.08 cwt.	2.10					Add timber 29.273 M.B.M. 43.64				32	70	22				1,277	95	1,213		
														13,951		7,271	11,882	50	5,941	15,031		8,317		
236.8	310	143	10	Piling 1,200 lin. ft. @ $0.40			Piling 1,100 lin. ft. @ $0.40			As per Exhibit 1 Deduct:—				480	50	240	440							
				Timber 17.72 M.B.M. 43.64			Timber 17.68 M.B.M. 43.00			Scrap rail 3.215 tons @ $14.00	45		45	773	50	386	760							
				Wrought iron Cast 2,546 lbs iron 854 lbs Total ——						Track spikes 3.92 cwt. 2.10	8		5											
											53		50											
				iron 3,400 lbs	0.035		Iron 2,000 lbs	0.035						119	66	79	70							
				Bridge ties (6.91 M.B.M.) 144—	2.0875		Bridge ties 7.15 M.B.M.	34.00						301	50	150	243							
				Guard rail 3.2148 tons	14.00					Total as per Exhibit 1	1,726		905	45	100	45							
				Guard rail spikes 3.92 cwt.	2.10					Deduct	53		50	8	66	5				1,673		855		
														1,726		905	1,513	50	757	1,673		855		
	316	362	24	Piling 2,500 lin. ft. @ $0.40			Piling 2,160 lin. ft. @ $0.40			See Culverts				1,000	72	720	864							

TRESTLES—Continued

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
							C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				$	$		$		$	$		$	$		$
	Bruce's Crossing			Timber 112.66 M.B.M. 43.64 Wrought iron 11,833 lbs Cast iron 4,464 lbs Total ——	Timber 97.52 M.B.M. 38.00		4,916	58	2,851	3,706					
				iron 16,297 0.035	Iron 5,116 lbs. 0.035		570	86	490	179					
				Bridge ties (17.42 M.B.M.) 363 2.0875	Bridge ties 18.10 M.B.M. 34.00		758	58	440	615					
				Guard rail 6.9654 tons 14.00			98	100	98						
				Guard rail spikes 8.86 cwt. 2.10			19	86	16						
							7,361		4,615	5,364	50	2,682			
	320	48	4	See Culverts	See Culverts	Piling 480 lin. ft. @ $0.40							192	95	18
						Timber 6.63 M.B.M. 43.64							289	95	275
						Wrought iron 597 lbs 0.035							31	95	29
						Cast iron 169 lbs 0.035							6	95	5
						Bridge ties 49 2.0875							102	95	97
													620		588
265.0	323	48	4	Piling 480 lin. ft. @ $0.40 Timber 6.63 M.B.M. 43.64	Piling 480 lin. ft. @ $0.40 Timber 6.81 M.B.M. 43.00	Total as per Exhibit 1 Add timber 2.246 M.B.M. 43.64	192 289	52 50	100 144	192 293			620 98	95	324 93

				Wrought iron 897 lbs Cast ir. 168 lbs Total —— iron 1,065 lbs 0.035 Bridge ties (2.35 M.B.M) 49 2.0875		Iron 800 lbs 0.035 Bridge ties 2.40 M.B.M. 34.00						37	76	29	28						
												102	50	51	82						
												620		324	595	50	298	718		417	
266.3	324	80	6	Piling 720 lin. ft. @ $0.40 Timber 10.05 M.B.M. 43.64 Wrought iron 1,475 lbs Cast iron 332 lbs Total —— iron 1,807 lbs 0.035 Bridge ties (3.89 M.B.M.) 81 2.0875 Guard rail 2.1432 tons 14.00 Guard rail spikes 2.51 cwt. 2.10		Piling 840 lin. ft. @ $0.40 Timber 10.46 M.B.M. 43.00 Iron 1,200 lbs 0.035 Bridge ties 4.00 M.B.M. 34.00		As per Exhibit 1 Deduct:— Scrap rail 2.143 tons @ $14.00 Track spikes 2.51 cwt. 2.10 Total as per Exhibit 1 Deduct Add timber 3.744 M.B.M. 43.63	30 5 35 995 35	30 4 34 537 34	288 439 64 169 30 5	52 50 76 50 100 76	150 220 49 84 30 4	336 450 42 136			960 163	95	503 155	
												995		537	964	50	482	1,128		658	
268.0	326	48	4	Piling 480 lin. ft. @ $0.40 Timber 6.63 M.B.M. 43.64 Wrought iron 897 lbs Cast iron 168 lbs Total —— iron 1,065 lbs 0.035 Bridge ties (2.35 M.B.M.) 49 2.0875		Piling 520 lin. ft. @ $0.40 Timber 6.81 M.B.M. 43.00 Iron 800 lbs 0.035 Bridge ties 2.40 M.B.M. 34.00		Total as per Exhibit 1 Add timber 2.246 M.B.M. 43.64			192 289 37 102	52 50 76 50	100 144 29 51	208 292 28 82			620 98	95	324 93	
												620		324	610	50	305	718		417	

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A			1911			1912			1913		
									C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
									$		$	$		$	$		$
268.7	327	177	12	Piling 1,200 lin. ft. @ $0.40	Piling 720 lin. ft. @ $0.40	As per Exhibit 1			480	52	250	288					
	Onton	agon	River	Timber 20.45 M.B.M. 43.64	Timber 21.50 M.B.M. 43.00	Deduct :— Scrap rail 3.7506 tons @ $14.00	53	53	892	50	446	925					
				Wrought iron 2,944 lbs		Track spikes 4.64 cwt. 2.10	10	8									
				Cast iron 1,117 lbs			63	61									
				Total ——													
				iron 4,061 lbs 0.035	Iron 2,400 lbs 0.035				142	76	108	84					
				Bridge ties (8.54 M.B.M.) 178 2.0875	Bridge ties 8.85 M.B.M. 34.00	Total as per Exhibit 1	1,949	1,051	372	50	186	301					
				Guard rail 3.7506 tons 14.00		Deduct	63	61	53	100	53				1,886		990
				Guard rail spikes 4.64 cwt. 2.10		Add timber 8.26 M.B.M. 43.64			10	76	8				360	95	342
									1,949		1,051	1,598	50	799	2,246		1,332
273.8	329	112	9	Piling 900 lin. ft. @ $0.40	Piling 990 lin. ft. @ $0.40	As per Exhibit 1			360	50	180	396					
				Timber 12.62 M.B.M. 43.64	Timber 14.64 M.B.M. 43.00	Deduct:— Scrap rail 2.679 tons @ $14.00	38	38	551	50	276	630					
				Wrought iron 1,613 lbs		Track spikes 2.62 cwt. 2.10	6	4									
				Cast iron 459 lbs			44	42									
				Total ——													
				iron 2,072 lbs 0.035	Iron 1,760 lbs 0.035				72	74	53	62					
				Bridge ties (5.42 M.B.M.) 113 2.0875	Bridge ties 5.60 M.B.M. 34.00	Total as per Exhibit 1	1,264	670	236	50	118	190					

				Guard rail 2.6790 tons 14.00 Guard rail spikes 3.24 cwt. 2.10				Deduct Add timber 5.242 M.B.M. 43.64	44		42	38	100	38				1,220		628
												7	74	5				229	95	218
												1,264		670	1,278	50	639	1,449		846
274.6	330	96	7	Piling 700 lin. ft. @ $0.40 Timber 11.31 M.B.M. 43.64 Wrought iron 1,879 lbs Cast iron 930 lbs Total iron 2,809 lbs 0.035 Bridge ties (4.66 M.B.M.) 97 2.0875 Guard rail 2.1432 tons 14.00 Guard rail spikes 2.62 cwt. 2.10		Piling 560 lin. ft. @ $0.40 Timber 12.29 M.B.M. 43.00 Iron 1,400 lbs 0.035 Bridge ties 4.80 M.B.M. 34.00		As per Exhibit 1 Deduct:— Scrap rail 2.143 tons 14.00 Track spikes 2.62 cwt. 2.10 Total as per Exhibit 1 Deduct Add timber 4.493 M.B.M. 43.64	30 6 36 1,111 36	30 4 34 595 34	280 494 99 202 30 6	50 50 74 50 100 74	140 247 73 101 30 4	224 528 49 163			1,075		561 186
												1,111		595	964	50	482	1,271		747
279.4	331	80	6	Piling 720 lin. ft. @ $0.40 Timber 9.33 M.B.M. 43.64 Wrought iron 1,226 lbs Cast iron 212 lbs Total iron 1,438 lbs 0.035 Bridge ties (3.89 M.B.M.) 81 2.0875		Piling 840 lin. ft. @ $0.40 Timber 10.46 M.B.M. 43.00 Iron 1,200 lbs 0.035 Bridge ties 4.60 M.B.M. 34.00		As per Exhibit 1 Deduct:— Scrap rail 2.143 tons @ $14.00 Track spikes 2.51 cwt. 2.10 Total as per Exhibit 1	30 5 35 949	30 4 34 503	288 407 50 169	50 50 74 50	144 204 37 84	336 450 42 136					

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A				1911			1912			1913		
										C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
										$		$	$		$	$		$
				Guard rail 2.1432 tons 14.00		Deduct	35		34	30	100	30	-			914		694
				Guard rail spikes 2.51 cwt. 2.10		Add timber 3.744 M.B.M. 43.64				5	74	4				163	95	155
										949		503	964	50	482	1,077		634
281.9	333	32	3	Piling 360 lin. ft. @ $0.40	Piling 180 lin. ft. @ $0.40	Total as per Exhibit 1				144	50	72	72			428		221
				Timber 4.21 M.B.M. 43.64	Timber 5.00 M.B.M. 43.00	Add timber 1.498 M.B.M. @ $43.64				184	50	92	215			65	95	62
				Wrought iron 673 lbs														
				Cast ir. 207 lbs														
				Total ——														
				iron 880 lbs 0.035	Iron 600 lbs 0.035					31	74	23	21					
				Bridge ties (1.58 M.B.M.) 33 2.0875	Bridge ties 1.60 M.B.M. 34.00					69	50	34	54					
										428		221	362	50	181	493		283
285.4	334½	16	2	Piling 132 lin. ft. @ $0.40	Piling 120 lin. ft. @ $0.40	Total as per Exhibit 1				53	52	28	48			221		116
				Timber 2.75 M.B.M. 43.64	Timber 3.16 M.B.M. 43.00	Add timber 0.749 M.B.M. @ $43.64				120	50	60	136			33	95	31
				Wrought iron 308 lbs														
				Cast ir. 68 lbs														
				Total ——														
				iron 376 lbs 0.035	Iron 600 lbs 0.035					13	76	10	21					
				Bridge ties (0.82 M.B.M.) 17 2.0875	Bridge ties 0.80 M.B.M. 34.00					35	50	18	27					
										221		116	232	50	116	254		147

288.8	336	32	3	Piling 300 lin. ft. @ $0.40 Timber 3.85 M.B.M. 43.64 Wrought iron 551 lbs Cast ir. 147 lbs Total iron 698 lbs 0.035 Bridge ties (1.58 M.B.M.) 33 2.0875	Piling 180 lin. ft. @ $0.40 Timber 5.00 M.B.M. 43.00 Iron 600 lbs 0.035 Bridge ties 1.60 M.B.M. 34.00	Total as per Exhibit 1 Add timber 1.498 M.B.M. @ $43.64																					

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A			1911			1912			1913		
									C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
									$		$	$		$	$		$
295.3	344	349	21	Piling 4,200 lin. ft. @ $0.40	Piling 1,260 lin. ft. @ $0.40	As per Exhibit 1			1,680	52	874	504					
				Timber 76.33 M.B.M. 43.64	Timber 71.27 M.B.M. 38.00	Deduct:— Guard rail 9.965 tons @ $14.00	98	98	3,331	50	1,666	2,708					
				Wrought iron 10,592 lbs		Track spikes 8.77 cwt. 2.10	18	14									
				Cast iron 4,715 lbs			116	112									
				Total — iron 15,307 lbs 0.035	Iron 4,127 lbs 0.035				536	76	407	144					
				Bridge ties (16.80 M.B.M.) 350 2.0875	Bridge ties 17.45 M.B.M. 34.00	Total as per Exhibit 1	6,394	3,425	731	50	366	593					
				Guard rail 6.9654 tons 14.00		Deduct	116	112	98	100	98				2,278		3,313
				Guard rail spikes 8.77 cwt. 2.10		Add timber 16.33 M.B.M. 43.64			18	76	14				713	95	676
									6,394		3,425	3,949	50	1,975	6,991		3,989
297.3	345	48	4	Piling 480 lin. ft. @ $0.40	Piling 240 lin. ft. @ $0.40	Total as per Exhibit 1			192	50	96	96			620		317
				Timber 6.63 M.B.M. 43.64	Timber 6.81 M.B.M. 43.00	Add timber 2.246 M.B.M. 43.64			289	50	144	293			98	95	93
				Wrought iron 897 lbs													
				Cast ir. 168 lbs													
				Total — iron 1,065 lbs 0.035	Iron 800 lbs 0.035				37	72	26	280					
				Bridge ties (2.35 M.B.M.) 49 2.0875	Bridge ties 2.40 M.B.M. 34.00				102	50	51	816					
									620		317	1,485	50	743	718		410

299.0	346	108	8	Piling 800 lin. ft. @ $0.40		Piling 880 lin. ft. @ $0.40		As per Exhibit 1			320	50	160	352									
				Timber		Timber		Deduct:—																
				13.57 M.B.M.	43.64	13.79 M.B.M.	43.00	Scrap rail																
				Wrought iron				2.679 tons @ $14.00	38	38	592	50	295	593									
				2,004 lbs				Track spikes																
				Cast iron				3.18 cwt. 2.10	7	5														
				674 lbs					45	43														
				Total ——																				
				iron 2,678 lbs	0.035	Iron 1,585 lbs	0.035				94	72	67	55										
				Bridge ties (5.23 M.B.M.)		Bridge ties																		
				109	2.0875	5.40 M.B.M.	34.00	Total as per Exhibit 1	1,279	680	228	50	114	184										
				Guard rail																				
				2.6790 tons	14.00			Deduct	45	43	38	100	38						1,234		637			
				Guard rail spikes				Add timber																
				3.18 cwt.	2.10			.5054 M.B.M. 43.64			7	72	5						221	95	210			
											1,279		680	1,184	50	592	1,455		847					
302.0	347	48	4	Piling 400 lin. ft. @ $0.40		Piling 240 lin. ft. @ $0.40		Total as per Exhibit 1			160	50	80	96			514		265					
				Timber		Timber		Add timber																
				5.02 M.B.M.	43.64	6.81 M.B.M.	43.00	2.246 M.B.M. 43.64			219	50	110	293			98	95	93					
				Wrought iron 795 lbs																				
				Cast ir. 132 lbs																				
				Total ——																				
				iron 927 lbs	0.035	Iron 800 lbs	0.035				33	72	24	28										
				Brisge ties (2.35 M.B.M.)		Bridge ties																		
				49	2.0875	2.40 M.B.M.	34.00				102	50	51	82										
											514		265	499	50	250	612		358					
0.2	1E	119	8	Piling		Piling		As per Exhibit 1			448	92	412	416										
				1,120 lin. ft. @ $0.40		1,040 lin. ft. @ $0.40		Deduct:—																
				Timber		Timber		Scrap rail																
				15.05 M.B.M.	43.64	14.68 M.B.M.	43.00	2.679 tons @ $14.00	38	38	657	88	578	631										
				Wrought iron				Track spikes																
				2,040 lbs				3.27 cwt. 2.10	7	7														
				Cast iron					45	45														
				756 lbs																				
				Total ——																				
				iron 2,796 lbs	0.035	Iron 1,610 lbs	0.035				97	96	93	56										

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A				1911			1912			1913		
										C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
										$		$	$		$	$	$	
				Bridge ties (5.76 M.B.M.) 120 2.0875	Bridge ties 5.95 M.B.M. 34.00					250	88	220	202					
				Guard rail 2.679 tons 14.00		Total as per Exhibit 1	1,497		1,348	38	100	38						
				Guard rail spikes 3.27 cwt. 2.10			45		45	7		7				1,452		1,303
										1,497		1,348	1,305	75	979	1,452		1,303
0.5	2E	197	14	Piling 1,860 lin. ft. @ $0.40	Piling 1,820 lin. ft. @ $0.40	As per Exhibit 1				744	92	684	728					
						Deduct:—												
				Timber 28.34 M.B.M. 43.64	Timber 24.18 M.B.M. 43.00	Scrap rail 4.286 M.B.M. @ $14.00	60		60	1,237	88	1,089	1,040					
				Wrought iron 4,243 lbs		Track spikes 5.27 cwt. 2.10	11		11									
				Cast iron 1,752 lbs														
				Total —— iron 5,995 lbs 0.035	Iron 2,775 lbs 0.035		71		71	209	96	201	97					
				Bridge ties (9.50 M.B.M.) 198 2.0875	Bridge ties 9.85 M.B.M. 34.00					413	88	363	335					
				Guard rail 4.2864 tons 14.00		Total as per Exhibit 1	2,674		2,408	60	100	60						
				Guard rail spikes 5.27 cwt. 2.10			71		71	11		11				2,603		2,337
										2,674		2,408	2,200	75	1,650	2,603		2,337
0.6	3E	168	12	Piling 1,200 lin. ft. @ $0.40	Piling 1,320 lin. ft. @ $0.40	As per Exhibit 1				480	92	442	528					

				Timber 19.32 M.B.M. 43.64		Timber 20.77 M.B.M. 43.00		Deduct:— Scrap rail 3.571 tons @ $14.00	53		53	843	88	742	893							
				Wrought iron 2,766 lbs				Track spikes 4.57 cwt. 2.10	10		10												
				Cast iron 1,047 lbs					63		63												
				Total iron 3,813 lbs	0.035	Iron 2,380 lbs	0.035				3366	134	96	129	83							
				Bridge ties (8.11 M.B.M.) 169	2.0875	Bridge ties 8.40 M.B.M.	34.00					353	88	311	286							
				Guard rail 3.7506 tons	14.00			Total as per Exhibit 1	1,873		1,687	53	100	53								
				Guard rail spikes 4.57 cwt.	2.10			Deduct	63		63	10		10				1,810		1,624
												1,873		1,687	1,790	75	1,343	1,810		1,624
0.7	4E	92	7	Piling 560 lin. ft. @ $0.40		Piling 420 lin. ft. @ $0.40		As per Exhibit 1				224	92	206	168							
				Timber 11.31 M.B.M. 43.64		Timber 11.96 M.B.M. 43.00		Deduct:— Scrap rail 2.143 tons @ $14.00	30		30	494	88	435	514							
				Wrought iron 1,871 lbs				Track spikes 2.6 cwt. 2.10	5		5												
				Cast iron 930 lbs					35		35												
				Total iron 2,801 lbs	0.035	Iron 1,385 lbs	0.035					98	96	94	48							
				Bridge ties (4.46 M.B.M.) 93	2.0875	Bridge ties 4.60 M.B.M.	34.00					194	88	171	156							
				Guard rail 2.1432 tons	14.00			Total as per Exhibit 1	1,045		941	30	100	30								
				Guard rail spikes 2.60 cwt.	2.10			Deduct	35		35	5		5				1,010		906
												1,045		941	886	75	665	1,010		906

Mile Post	Bridge No.	Lgth. Feet	No. Bents	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A			1911			1912			1913		
									C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
									$		$	$		$	$		$
1.3	5E	106	7	Piling 980 lin. ft. @ $0.40	Piling 910 lin. ft. @ $0.40	As per Exhibit 1			392	92	361	364					
				Timber	Timber	Deduct:—											
				15.21 M.B.M. 43.64	17.47 M.B.M. 43.00	Scrap rail											
				Wrought iron		2.679 tons @ $14.00	38	38	664	88	584	751					
				2,083 lbs		Track spikes											
				Cast iron		3.18 cwt. 2.10	7	7									
				815 lbs			45	45									
				To al ——													
				iron 2,898 lbs 0.035	Iron 1,535 lbs 0.035				102	96	98	54					
				Bridge ties (5.14 M.B.M.)	Bridge ties												
				107 2.0875	5.30 M.B.M. 34.00				223	88	196	180					
				Guard rail													
				2.679 tons 14.00		Total as per Exhibit 1	1,426	1,284	38	100	38						
				Guard rail spikes													
				3.18 cwt. 2.10		Deduct	45	45	7		7				1,381		1,239
									1,426		1,284	1,349	75	1,012	1,381		1,239
1.5	6E	106	7	Piling 980 lin. ft. @ $0.40	Piling 840 lin. ft. @ $0.40	As per Exhibit 1			392	92	361	336					
				Timber	Timber	Deduct:—											
				15.21 M.B.M. 43.64	17.47 M.B.M. 43.00	Scrap rail											
				Wrought iron		2.679 tons @ $14.00	38	38	664	88	584	751					
				2,083 lbs		Track spikes											
				Cast iron		3.18 cwt. 2.10	7	7									
				815 lbs			45	45									
				Total ——													
				iron 2,898 lbs 0.035	Iron 1,535 lbs 0.035				102	96	98	54					
				Bridge ties (5.14 M.B.M.)	Bridge ties												
				107 2.0875	5.30 M.B.M. 34.00				223	88	196	180					

				Guard rail 2.6786 tons 14.00 Guard rail spikes 3.18 cwt. 2.10			Total as per Exhibit 1	1,426		1,284	38	100	38							
							Deduct	45		45	7		7					1,381		1,239
											1,426		1,284	1,321	75	991	1,381		1,239	
1.8	7E	62	5	Piling 500 lin. ft. @ $0.40 Timber 7.83 M.B.M. 43.64 Wrought iron 995 lbs Cast iron 289 lbs Total iron 1,284 lbs 0.035 Bridge ties (3.02 M.B.M.) 63 2.0875 Guard rail 1.6074 14.00 Guard rail spikes 1.90 2.10	Piling 300 lin. ft. @ $0.40 Timber 8.47 M.B.M. 43.00 Iron 990 lbs 0.035 Bridge ties 3.10 M.B.M. 34.00		As per Exhibit 1 Deduct:— Scrap rail 1,607 tons @ $14.00 Track spikes 1.9 cwt. 2.10 Total as per Exhibit 1 Deduct	22 4 26 745 26		22 4 26 640 26	200 342 45 132 22 4	92 88 96 88 100	184 301 13 116 22 4	120 364 35 105 624	75	468	719	614
											745		640							
		48	4	Bergland Branch: Omitted	Piling 240 lin. ft. @ $0.40 Timber 6.80 M.B.M. 43.00 Iron 800 lbs 0.035 Bridge ties 2.40 M.B.M. 34.00		Omitted							96 370 28 82						
														576	50	288				
							Allocated 1913 Freight and Passenger Freight										45,744 10,356		26,243 9,262	
				Total Nestoria to State	Line						69,588		41,453	55,500		30,572	56,100		35,505	

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS

Mile Post	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1911—Exhibit 1-A	1911		1912		1913	
				SAULT STE. MARIE TO MARQUETTE:			C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
							$	$	$	$	$	$
1.0		2'x1'	4			Filled	58	34	58	34		
	3	3½'x6'	10	Double			1,086	893	1,086	893	1,086	893
2.2	4	5'x4'	15				595	354	595	354	595	354
3.0		3½'x2'	3				80	45	80	45	80	45
4.0		2½'x2'	3			Filled	69	45	69	43		
5.0		4'x2'	8				243	206	244	207	243	206
6.0		2½'x3'	8			Filled	152	99	152	99		
7.0		2'x2½'	3			Filled	56	35	56	53		
7.6	5	4'x5'	35				1,492	957	1,492	957	1,492	957
9.0		2½'x2½'	4			Filled	88	55	88	55		
10.0		2'x2'	5			Filled	85	55	85	55		
		2'x2'	4			Filled	74	41	74	41		
11.0		2½'x2½'	5			Filled	101	64	101	64		
		2½'x2'	15			Filled	229	172	229	172		
		9"x9"	3			Filled	20	19	19	18		
12.0		14"	16				182	115	182	115	182	115
		2'x1'	5			Filled	64	41	64	41		
		3'x2½'	5				106	67	106	67	106	67
		3'x2'	4			Filled	84	53	84	53		
		3'x2'	3			Filled	72	44	72	44		
		3'x2'	10				161	108	161	108	161	108
15.0		3'x3'	10				195	130	195	130	195	130
		2'x2'	3			Filled	62	38	62	38		
		4½'x3'	6				239	150	239	150	239	150
		2'x2'	3			Filled	62	38	62	38		
		2'x2'	3			Filled	62	38	62	38		
		2½'x2'	5			Filled	92	59	92	59		
16.0		2½'x2'	6			Filled	104	68	104	68		
		2½'x2'	6			Filled	104	68	104	68		
17.0		2½'x2"	9			Filled	142	96	142	96		
		2'x2'	3			Filled	62	38	62	38		

		4½′x2′	9							282	184	282	184	282	184
		16″	14							176	137	176	137	176	137
18.0		14″	12							146	114	146	114	146	114
30.0	7	3′x3′	4	Filled						116	63	116	63		
30-35		36′-24″	7	Excavation and backfill											
				44 c.y. @	$0.70	31	100	31							
				Cast iron pipe											
				4.68 tons	42.60	199	98	195							
						230		226						230	226
		2½′x2′	4	Filled						80	51	80	51		
		2′x2′	2	Filled						54	29	54	29		
		2½′x2′	5							92	59	92	59	92	59
		2½′x2′	4	Filled						80	45	80	45		
		1′x1′	2	Filled						20	11	20	11		
		2½′x2′	5	Filled						92	59	92	59		
35.0	11	5½′x4′	5							271	148	271	148	271	148
				Excavation and backfill											
				36 c.y. @	$0.70	25	100	25							
				32′-36″ concrete pipe											
					6.97	223	100	223							
						248		248						248	248
		2′x2′	5	Filled						85	59	85	59		
		2′x2′	5	Filled						85	59	85	59		
		8″	5							41	33	41	33	41	33
		3′x2′	6							113	80	113	80	113	80
		2′x2′	4	Filled						74	51	74	51		
		2′x2′	4	Filled						74	51	74	51		
		8″x8″	2	Filled						15	12	15	12		
		2′x2′	4	Filled						74	41	74	41		
		2′x2′	5	Filled						85	59	85	59		
		2′x2′	7	Filled						107	70	107	70		
		2½′x2′	8	Filled						129	111	129	111		
36.0	13	4′x4′	4							231	179	231	179	231	179
37.0		2½′x2½′	2	Filled						64	42	64	42		
		2½′x1½′	2	Filled						52	43	52	43		
		20″x1½′	2							45	30	45	30		
		20″x2′	3							60	41	60	41	60	41
		20″x1½′	3							53	36	53	36		

Mile Post	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1911—Exhibit 1-A				1911		1912		1913	
										C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
										$	$	$	$	$	$
		20"x1½'	2			Filled				45	30	45	30		
		2'x2'	2							54	36	54	36	54	36
		20"x1½'	3							53	36	53	36	53	36
38		2'x2'	3							63	42	63	42		
		2'x2'	3			Filled				62	42	63	42		
		2'x2'	2							54	36	54	36	54	36
		2'x1½'	3			Filled				56	38	56	38		
		1'x1'	3			Filled				24	14	24	14		
		2½'x1½'	3			Filled				56	38	56	38		
		2'x2'	3							63	42	63	42	63	42
		2'x2'	2			Filled				54	36	54	36		
		2'x2'	2							54	36	54	36	54	36
38.1	15	2½'x2'	4							80	45	80	45	80	45
38.2	16	3'x1'	3							61	34	61	34	61	34
38.2	17	2'x2'½	3							56	38	56	38	56	38
38.4	18	1'x1'	3							24	14	24	14	24	14
39.0		3'x2'	3							75	42	75	42	75	42
		2'x1½'	4							70	49	70	49	70	49
		2½'x2'	4							80	51	80	51	80	51
		2½'x2'	3							69	50	69	50	69	50
		2'x1½'	3							56	38	56	38	56	38
		8"x10"	2							16	9	16	9	16	9
41.7	21	3'x2'	4							98	55	98	55	98	55
						Excavation and backfill									
						44 c.y. @ $0.70		31	100	31					
						Cast iron pipe 36'-30''									
						6.48 tons	42.60	276	98	270					
								307		301				307	301
44.0		1'x10"	2			Filled				19	11	19	11		
		1'x10"	2							19	11	19	11	19	11
		10"x10"	2			Filled				18	11	18	11		

		10"x10"	2	Filled				18	11	18	11						
		10"x10"	2	Filled				18	11	18	11						
		1'x1'	3	Filled				24	14	24	14						
		4'x4'	7	Excavation and backfill													
				29 c.y. @ $0.70	20	100	20										
				Timber													
				4.48 M. 36.64													
				Drift bolts													
				112 lbs 0.03½	168	95	160										
					188		180									188	180
		3'x2'	3	Excavation and backfill													
				11 c.y. @ $0.70	8	100	8										
				Timber													
				1.78 M. 36.64													
				Drift bolts													
				44 lbs 0.03½	67	95	64										
					75		72									75	72
	45.0	1'x1'	2	Filled				20	11	20	11						
		2½'x2'	3	Filled				69	38	59	38						
		2½'x3'	3					83	45	83	45	83	45				
	47.2	25 2½'x2'	3					69	38	69	38	69	38				
	47.6	26 2½'x3'	4					94	51	94	51	94	51				
	51.7	29 3'x3'	4½					109	86	109	86	109	86				
	52.0	30 3'x2'	4	Excavation and backfill													
				16 c.y. @ $0.70	11	100	11										
				Timber													
				2.01 M. 36.64													
				Drift bolts													
				50 lbs 0.03½	75	95	71										
					86		82									86	82
	52.4	31 3'x2'	4	Excavation and backfill													
				16 c.y. @ $0.70	11	100.	11										
				Timber													
				2.01 M. 36.64													
				Drift bolts													
				50 lbs 0.03½	75	95	71										
					86		82									86	82

Mile	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1913—Exhibit 1-A				1911		1912		1913	
										C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
										$	$	$	$	$	$
53.7	32	2'x2'	4			Excavation and backfill									
						13 c. y. @ $0.70	9	100	9						
						Timber									
						1.72 M. 36.64									
						Drift bolts									
						43 lbs 0.03½	65	95	62						
							74		71					74	71
53.9	33	2'x2'	4							74	58	74	58	74	58
54.0	34	3'x2'	4			Excavation and backfill									
						16 c. y. @ $0.70	11	100	11						
						Timber									
						2.01 M. 36.64									
						Drift bolts									
						50 lbs 0.03½	75	95	71						
							86		82					86	82
54.7	35	2'x2'	3							63	34	63	34	83	34
		24"x24'	3			Excavation and backfill									
						9 c. y. @ $0.70	6	100	6						
						Concrete pipe									
						24 ft. 3.80	91	95	86						
							97		92					97	92
55.3	36	3'x3'	6							125	75	125	75	125	75
55.8	37	2'x2'	3							63	34	63	34	63	34
56.2	38	2'x2'	3							63	34	63	34	63	34
57.6	40	4'x3'	4							179	97	179	97	179	97
57.8	41	4'x3'	4							179	97	179	97	179	97
58.5	42	3'x2'	7							125	101	125	101	125	101
58.6	43	3'x2'	7							125	101	125	101	125	101

		24'x24"	3		Excavation and backfill														
					9 c. y. @ $0.70	6	100	6											
					Concrete pipe														
					24 ft. 3.80	91	100	91											
						97		97									97	97	
	44	3'x2'	4		Excavation and backfill														
					16 c. y. @ $0.70	11	100	11											
					Timber														
					2.01 M. 36.64														
					Drift bolts														
					50 lbs 0.03½	75	95	71											
						86		82									86	82	
									63	34	63	34	63	34					
59.4	45	2'x2'	3																
		24'x24"	3		Excavation and backfill														
					9 c.y. @ $0.70	6	100	6											
					Cast iron pipe														
					3.12 tons 42.60	133	100	133											
						139		139									139	139	
									63	34	63	34	63	34					
59.5	46	2'x2'	3																
		24'x24"	3		Excavation and backfill														
					9 c. y. @ $ 0.70	6	100	6											
					Cast iron pipe														
					3.12 tons 42.60	133	100	133											
						139		139									139	139	
									104	61	104	61	104	61					
59.7	47	2½'x2'	6		Excavation and backfill														
					23 c.y. @ $0.70	16	100	16											
					24" concrete pipe														
					32 ft. 3.80	122	100	122											
						138		138									138	138	
	50	24'x24"	3		Excavation and backfill														
					9 c.y. @ $0.70	6	100	6											
					Cast iron pipe														
					3.12 tons 42.60	133	100	133											
						139		139									139	139	

Mile	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1913—Exhibit 1-A				1911		1912		1913	
										C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
	51	4'x3'	6			Excavation and backfill				$	$	$	$	$	$
						36 c.y. @ $0.70	25	100	25						
						Timber									
						5.04 M. 36.64									
						Drift bolts									
						126 lbs 0.03½	189	95	180						
							214		205					214	205
60.5	52	4'x3'	6							214	169	214	169	214	169
60.7	53	4'x3'	6							214	169	214	169	214	169
	54	4'x5'	6			Excavation and backfill									
						44 c.y. @ $0.70	31	100	31						
						Timber									
						6.72 M. 36.64									
						Drift bolts									
						168 lbs 0.03½	252	95	239						
							283		270					283	270
61.7	55	4'x2'	4							156	105	156	105	156	105
62.4	56	2'x2'	3			Excavation and backfill				63	34	63	34	63	34
						9 c.y. @ $0.70	6	100	6						
						16" cast iron pipe 24 ft.									
						1.60 tons 42.60	68	100	68						
							74		74					74	74
66.1	61	2'x2'	4							74	41	74	41	74	41
66.5	62	4'x2'	4			Excavation and backfill									
						21 c.y. @ $0.70	15	100	15						
						Timber									
						3.75 M. 36.64									
						Drift bolts									
						94 lbs 0.03½	141	95	134						
							156		149					156	149

	63	4′x2′	4	Excavation and backfill 21 c.y. @ $0.70		15	100	15											
				Timber 3.75 M.	36.64														
				Drift bolts 94 lbs	0.03½	141	59	134											
						156		149										156	149
	64	4′x2′	4	Excavation and backfill 21 c.y. @ $0.70		15	100	15											
				Timber 3.75 M.	36.64														
				Drift bolts 94 lbs	0.03½	141	95	134											
						156		149										156	149
	65	24′x18″	3	Excavation and backfill 9 c.y. @ $0.70		6	100	6											
				Cast iron pipe 1.92 tons	42.60	82	98	80											
						88		86										88	86
		6′x2′	6						258	145	258	145	258	145					
68.9	66	2′x2′	3						63	34	63	34	63	34					
69.7	67	4′x3′	5						203	112	203	112	203	112					
70.2	69	16″	2						51	26	51	26	51	26					
70.9	74	3′x2′	3						75	42	75	42	75	42					
				Excavation and backfill 9 c.y. @ $0.70		6	100	6											
				Cast iron pipe—24′ 1.92 tons	42.60	82	98	80											
						88		86										88	86
	75	24′x18″	3	Excavation and backfill 9 c.y. @ $0.70		6	100	6											
				Cast iron pipe 1.92 tons	42.60	82	98	80										88	86
						88		86											
		2′x2′	3						63	34	63	43	63	34					

Mile Post	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1911—Exhibit 1-A				1911		1912		1913	
										C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
										$	$	$	$	$	$
71.7	77	4'x3'	4							204	109	204	109	204	109
73.7	80	3'x2'	6½							119	70	119	70	119	70
74.2	81	3'x2'	5							99	57	99	57	99	57
74.7	82	3'x3'	5							120	70	120	70	120	70
75.5	83	3'x3'	5							120	70	120	70	120	70
75.8	84	3'x3'	5							120	70	120	70	120	70
76.4	85	3'x3'	5							120	70	120	70	120	70
77.1	86	3'x2½'	4							120	70	120	70	120	70
77.8	88	3'x3'	5							94	53	94	53	94	53
						Excavation and backfill				120	70	120	70	120	70
						9 c.y. @ $0.70	6	100	6						
						Cast iron pipe 24'									
						1.92 tons 42.60	82	98	80						
							88		86					88	86
78.3	89	3'x2'	4							86	49	86	49	86	49
79.1	90	3'x3'	6			Excavation and backfill				125	75	125	75	125	75
						9 c.y. @ $0.70	6	100	6						
						Cast iron pipe 24'									
						1.92 tons 42.60	82	100	82						
							88		88					88	88
	91	3'x3'	6							125	75	125	75	125	75
79.9	94	4'x3'	7							258	176	258	176	258	176
	112	24'x24"	3			Excavation and backfill									
						9 c.y. @ 0.$70	6	100	6						
						Cast iron pipe									
						3.12 tons 42.60	133	98	130						
							139		136					139	136

86.5	114	4'x3'	5															
	117	24'x24"	3															
88.4	119	4'x3'	4	Excavation and Backfill														
				21 c.y. @ $0.70	15	100	15											
				Timber														
				4.37 M.B.M. 36.64														
				Drift Bolts 109 lbs 0.03½	164	50	82											
					179		97	Same										
89.0		2'x2'	3															
		4'x4'	5															
90.4	122	3'x4'	5															
92.0	124	2½'x2½'	5															
92.1	125	2'x2'	3															
92.4	126	2½'x2'	3															
94.0	129	4'x3'	5															
94.6	130	4'x2½'	3½															
95.1	131	3½'x2½'	5															
		2½'x2½'	2															
95.8	133	4'x3'	5															
97.1	136	2'x1½'	3½	Excavation and backfill														
				11 c.y. @ $0.70	8	100	8											
				Timber 1.43 M @ 36.64														
				Drift bolts														
				36 lbs 0.03½	54	50	27											
					62		35	Same										
		2'x1½'	3															

															209	141	209	141	209	141
				Excavation and backfill														
				9 c.y. @ $0.70	6	100	6											
				Cast iron pipe														
				3.12 tons 42.60	133	98	130											
					139		136										139	136
				24" cast iron pipe														
				Excavation and backfill														
				21 c.y. @ $0.70	15	100	15											
				Cast iron pipe 24 ft.														
				3.12 tons 42.60	133	98	130											
					148		145								179	97	179	97	148	145
															63	34	63	34	63	34
				Excavation and backfill														
				36 c.y. @ $0.70	25	100	25											
				Timber														
				6.15 M. 36.64														
				Drift bolts														
				154 lbs 0.03½	231	95	219											
					256		244										256	244
															138	79	138	79	138	79
															104	61	104	61	104	61
															63	34	63	34	63	34
															69	38	69	38	69	38
															203	112	203	112	203	112
															157	85	157	85	157	85
															179	98	179	98	179	98
															68	38	68	38	68	38
															203	115	203	115	203	115
				24" concrete pipe														
				Excavation and backfill														
				11 c.y. @ $0.70	8	100	8											
				Concrete pipe														
				24 ft. 3.80	91	100	91											
					99		99								62	35	62	35	99	99
															56	31	56	31	56	31

Mile Post	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1				Hansel—1912 Exhibit 15	Riggs—1911—Exhibit 1-A				1911		1912		1913	
													C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
													$	$	$	$	$	$
100.2	144	3'x3'	5	Excavation and backfill					18" cast iron pipe									
				22 c.y. @ $0.70		15	100 15		Excavation and backfill									
				Timber					22 c.y. @ $0.70	15	100	15						
				2.7 M. 36.64					Cast iron pipe 24'									
				Drift bolts					1.92 tons 42.60	82	98	80						
				68 lbs	0.03½	101	50 50			97		95	116	65	116	65	97	95
						116	65	Same										
103.5	147	4'x4'	6						Excavation and backfill									
									36 c.y. @ $0.70	25	100	25						
									Timber									
									6.15 M. 36.64									
									Drift bolts									
									154 lbs 0.03½	231	95	219						
										256		244					256	244
105.3	149	4'x3'	5	Excavation and backfill					24" wrought iron									
				28 c.y. @ $0.70		20	100 20		Excavation and backfill									
				Timber					28 c.y. @ $0.70	20	100	20						
				4.88 M. 36.64														
				Drift Bolts					Wrought iron 24'									
				122 lbs	0.03½	183	50 92		1,800 lbs 0.04	72	50	36						
						203	112	Same		92		56	203	112	203	112	92	56
109.0		2'x2'	14										196	129	186	129	196	129
109.6	150	3'x1'	3										63	37	63	37	63	37
109.8	151	4'x3'	6										214	119	214	119	214	119
		17"	18										248	153	248	153	248	153
112.5		15"	25										320	294	320	294	320	294
114.2	156	2'x3'	5	Excavation and backfill					18" cast iron pipe									
				18 c.y. @ $0.70		13	100 13		Excavation and backfill									
				Timber					78 c.y. @ $0.70	13	100	13						
				2.46 M. 36.64					Cast iron pipe 30 ft.									

				Drift Bolts 62 lbs	0.03½	92	50	46		2.40 tons	42.60	102	98	100									
												115		113									
						105		59	Same														
115.8	157	4′x6′	55	Stone arch											105	59	105	59	115	113			
116.0	158	4′x6′	63	Stone arch											5,217	4,164	5,217	4,164	5,217	4,164			
117.0		2′x2½′	20												5,804	4,834	5,804	4,834	5,804	4,834			
		48′x18″	8							Excavation and backfill					309	210	309	210	309	210			
										35 c.y. @ $0.70		24	100	24									
										Cast iron pipe													
										3.84 tons	42.60	164	98	161									
												188		185					188	185			
		2′x1½′	20												264	187	264	187	264	187			
		2′x2′	8							Replaced					118	73	118	73					
		8″	5												41	37	41	37	41	37			
		2′x2′	4							Filled					74	62	74	62					
		2′x2′	4												74	41	74	41	74	41			
		20′x10″	2												36	20	36	20	36	20			
		8″x1′	3							Filled					21	12	21	12					
118.0		2′x2′	3							Filled					63	34	63	34					
118.2	159	5½′x2′	4												193	106	193	106	193	106			
118.4	160	5′x3′	5												233	128	233	128	233	128			
118.5	161	5′x2′	4												183	100	183	100	183	100			
	162	24′x18″	4							Excavation and backfill													
										24 c.y. @ $0.70		17	100	17									
										Cast iron pipe													
										1.92 tons	42.60	82	98	80									
												99		97					99	97			
120.4	163	3′x3′	4												102	57	102	57	102	57			
120.6	164	2′x2′	3												63	49	63	49	63	49			
121.0		2½′x16″	6												91	56	91	57	91	56			
121.2	165	2½′x2′	3												69	38	69	38	69	38			
121.2		24′x18″	3							Excavation and backfill													
										10 c.y. @ $0.70		7	100	7									
										Cast iron pipe 24′													
										1.92 tons	42.60	82	98	80									
												89		87					89	87			
122.0	166	2′x2′	3												63	49	63	49	63	49			

Mile	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1913—Exhibit 1-A				1911		1912		1913	
										C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
										$	$	$	$	$	$
122.3	167	3'x1'	3							61	34	61	34	61	34
	168	4'x4'	7			Excavation and backfill									
						44 c.y. @ $0.70		31	100 31						
						Timber									
						6.72 M.	36.64								
						Drift bolts									
						168 lbs	0.03½	232	95 239						
								283	270					283	270
122.7	169	2'x2'	3							63	34	63	34	63	34
123.0	170	2'x2'	3½			Replaced				69	38	69	38		
123.0	171	4'x2'	4							156	85	156	85	156	85
123.1	172	3'x1½'	3½							74	42	74	42	74	42
123.6	173	2'x1'	3							49	28	49	28	49	28
		3'x2'	10							168	107	168	107	168	107
		3'x2½'	10							181	114	181	114	181	114
		2½'x20"	6							98	60	98	60	98	60
		2½'x16"	6							91	56	91	56	91	56
		2½'x16"	5							80	48	80	48	80	48
		2½'x16"	5							80	48	80	48	80	48
		2'x2'	8							118	71	118	71	118	71
		3'x2'	4							86	50	86	50	86	50
		3'x2'	5							99	59	99	59	99	59
127.9	178	2'x2'	5							85	49	85	49	85	49
128.0		3'x3'	5							116	68	116	68	116	68
		3'x3'	5							116	68	116	68	116	68
130		12"	16							170	131	170	131	170	131
		12"	12							128	97	128	97	128	97
		14"	12							144	126	144	126	144	126
131.0		12"	6							67	58	67	58	67	58
		12"	8							93	81	93	81	93	81
		14"	16							185	163	185	163	185	163
132.0		2'x2'	5							78	43	78	43	78	43

		14"	7				83	72	83	72	83	72
		14"	10				114	99	114	99	114	99
		7"	12				77	69	77	69	77	69
133.0		2'x2'	7				107	64	107	64	107	64
	180	3'x3'	32				667	475	667	475	667	475
133.6	181	8'x8'	11	Concrete arch			1,369	1,235	1,369	1,235	1,369	1,235
134.4	183	2'x1'	3				49	28	49	28	49	28
135		16"	14				176	159	176	159	176	159
135.2	184	2'x1'	3				49	28	49	28	49	28
135.6	185	4'x2'	4				156	88	156	88	156	88
		2'x2'	7				107	64	107	64	107	64
		2'x2'	5				85	50	85	50	85	50
		2'x2'	4				74	43	74	43	74	43
		2'x2'	6				96	62	96	62	96	62
		3'x4'	6				151	88	151	88	151	88
		2'x2'	4				74	43	72	43	74	43
137.0		3'x3'	6				132	76	132	76	132	76
137.9	188	2'x1'	3				49	28	49	28	49	28
138.0		2'x2'	8		Filled		118	71	118	71		
		3'x2'	6				112	66	113	66	113	66
		8"x8"	1				12	7	12	7	12	7
		1'x1'	2				20	11	20	11	20	11
		3½'x4½'	14				494	289	494	289	494	289
142.5		5'x2'	6				233	172	23	172	233	172
142.5	190	2'x3'	4½				96	53	96	53	96	53
142.5	191	3'x3'	6				132	76	132	76	132	76
	196	5'x6'	22	Stone			1,762	1,345	1,762	1,345	1,762	1,345
	197	2'x1'	3				49	28	49	28	49	28
154.0		1'x1'	2				20	11	20	11	20	11
		1'x1'	2				20	11	20	11	20	11
					Total Sault Ste. Marie to Marquette		40,846	28,886	40,834	28,887	41,639	31,266
				ST. IGNACE TO SOO JUNCTION:								
		4'x2'	5		Filled		182	101	182	101		
		4'x8'	8		Filled		448	243	448	243		
		8'x6'	6		Filled		428	217	428	217		
		3'x10"	4		Filled		68	39	68	39		
		6'x8'	7		Filled		515	278	515	278		
		6'x1'	8		Filled		282	165	282	165		
2.1	6A	3'x3'	5				116	65	116	65	116	65
	7A	3'x3'	5		Excavation and backfill 22 c.y. @ $0.70	15 100 15						

CULVERTS—Continued

Mile	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1913—Exhibit 1-A				1911		1912		1913	
										C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
						Timber				$	$	$	$	$	
						2.70 M. 36.64									
						Drift bolts									
						68 lbs 0.03½	101	50	50						
							116		65					116	65
4.7	12A	2'x2'	5							85	49	85	49	85	49
5.2	13A	2'x2'	5							85	49	85	49	85	49
5.2		24'x24"	5			Excavation and backfill									
						18 c.y. @ $ 0.70	13	100	13						
						24' concrete pipe									
						(1913) 3.80	91	100	91						
							104		104					104	104
5.6	14A	2'x2'	5							85	49	85	49	85	49
5.6		24'x30"	5			Excavation and backfill									
						18 c.y. @ $0.70	13	100	13						
						Cast iron pipe, 24'									
						(1913) 4.32 tons 42.60	184	100	184						
							197		197					197	197
6.5	16A	4'x3'	6							227	126	227	126	227	126
6.5		24'x36"	6			Excavation and backfill									
						36 c.y. @ $0.70	25	100	25						
						Cast iron pipe, 24' (1913)									
						5.86 tons 42.60	250	100	250						
							275		275					275	275
7.1	17A	4'x4'	7							283	157	283	157	283	157
7.1		36'x30"	7			Excavation and backfill									
						44 c.y. @ $0.70	31	100	31						
						Cast iron pipe, 36' (1913)									
						6.48 tons 42.60	276		276						
							307		307					307	307

								199	110	199	110	199	110
								211	116	211	116	211	116
								85	49	85	49	85	49
8.2	18A	3½'x2½'	6										
8.6	19A	3½'x3'	6										
9.5	20A	2'x2'	5										
9.5		40'x24"	5	Excavation and backfill									
				18 c.y. @ $0.70	13	100	13						
				40' concrete pipe (1913)									
				3.80	152	100	152						
					165		165					165	165
								85	49	85	49	85	49
10.0	22A	2'x2'	5										
10.0		24'x16"	5	Excavation and backfill									
				18 c.y. @ $0.70	13	100	13						
				Cast iron pipe, 24' (1913)									
				1.60 tons 42.60	68	100	68						
					81		81					81	81
								85	49	85	49	85	49
10.7	23A	2'x2'	5										
10.7	-	24'x24"	5	Excavation and backfill									
				18 c.y. @ $0.70	13	100	13						
				Cast iron pipe, 24' (1913)									
				3.12 tons 42.60	133	100	133						
					146		146					146	146
								177	98	177	98	177	98
10.8	24A	4'x2'	5										
	25A	3'x2'	4	Excavation and backfill									
				16 c.y. @ $0.70	11	100	11						
				Timber									
				2.01 M. 36.64									
				Drift bolts									
				50 lbs 0.035	75	50	38						
					86		49					86	49
								85	49	85	49	85	46
11.5	26A	2'x2'	5					227	126	227	126	227	126
12.6	27A	4'x3'	6										
12.6		24'x30"	6	Excavation and backfill									
				28 c.y. @ $0.70	20	100	20						
				24' concrete pipe (1913)									
				5.69	137	100	137						
					157		157					157	157
								191	104	191	104	191	104
13.4	28A	3½'x3'	5					85	49	85	49	85	49
14.1	30A	2'x2'	5										

Mile Post	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1911—Exhibit 1-A				1911		1912		1913	
										C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
										$	$	$	$	$	$
14.1		24'x24"	5			Excavation and backfill									
						18 c.y. @ $0.70	13	100	13						
						24' concrete pipe (1912)									
						3.80	91	100	91						
							104		104					104	104
17.0	37A	2'x2'	5							85	49	85	49	85	49
19.7	42 A	4'x3'	5							203	112	203	112	203	112
20.2	44A	4'x4'	6							256	141	256	141	256	141
21.1	47A	4'x2'	4							156	85	156	85	156	85
21.4	48A	2'x2'	4							74	41	74	41	74	41
		3'x3'	5							120	67	120	67		
		4'x4'	12			Filled				430	250	430	250		
		3'x3'	5			Filled				120	67	120	67		
		2'x2'	5			Filled				87	50	87	50		
		2'x2'	5			Filled				87	50	87	50		
		3'x3'	5			Filled				120	67	120	67		
22.0	49A	2'x2'	4							74	41	74	41	74	41
22.0		24'x24"	4			Excavation and backfill									
						13 c.y. @ $0.70	9	100	9						
						Cast iron pipe, 24' (1912)									
						3.12 tons 42.60	133	100	133						
							142		142					142	142
22.6	51A	3'x2'	4							86	49	86	49	86	49
23.3	53A	4'x3'	5							203	112	203	112	203	112
23.5	54A	2'x2'	4							74	41	74	41	74	41
23.7	55A	2'x2'	4							74	41	74	41	74	41
	56A	4'x4'	6			Excavation and backfill									
						36 cy. @ $0.70	25	100	25						
						Timber									
						6.15 M. 36.64									

															256	141	
														116	65	116	65
24.1	57A	3′x3′	5														
	58A	4′x4′	6														
				Excavation and backfill													
				36 c.y. @ $0.70		25	100	25									
				Timber													
				6.15 M.	36.64												
				Drift bolts													
				154 lbs	0.035	231	50	116									
						256		141							256	141	
														156	85	156	85
24.6	59A	4′x2′	4														
25.0	60 A	4′x3′	6														
				Excavation and backfill													
				36 c.y. @ $0.70		25	100	25									
				Timber													
				5.38 M.	36.64												
				Drift bolts													
				134 lbs	0.035	202	50	101									
						227		126							227	126	
														125	72	125	72
26.1	62 A	3′x3′	5½											203	112	203	112
26.4	64A	4′x3′	5											132	76	132	76
26.4	66A	3′x3′	6											116	65	116	65
27.4	67A	3′x3′	5											74	41	74	41
27.8	69A	2′x2′	4											266	152	266	152
		4′x2½′	8	Filled										319	178	319	178
		4′x4′	8											192	105	192	105
29.4	72A	3½′x3′	5											132	76	132	76
30.4	63A	3′x3′	6											132	76	132	76
30.6	74A	3′x3′	6											132	76	132	76
31.0	75A	3′x3′	6											132	76	132	76
31.4	76A	3′x3′	6											132	76	132	76
31.5	77A	3′x3′	6											99	57	99	57
31.8	78A	3′x2′	5											74	41	74	41
31.9	79A	2′x2′	4	Filled										156	85	156	85
32.5	82A	4′x2′	4											74	41	74	41
32.8	83A	2′x2′	4											49	28	49	28
32.9	84A	2′x1′	3														
	85A	3′x2′	4	Excavation and backfill													
				16 c.y. @ $0.70		11	100	11									

Mile Post	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1911—Exhibit 1-A	1911 C.R.	1911 P.V.	1912 C.R.	1912 P.V.	1913 C.R.	1913 P.V.
						Timber						
						2.01 M. 36.64						
						Drift bolts						
						50 lbs 0.035 75 50 38						
						86 49					86	49
	86A	'x4'	6			Excavation and backfill						
						36 c.y. @ $0.70 25 100 25						
						Timber						
						6.15 M. 36.64						
						Drift bolts						
						154 lbs 0.035 231 50 116						
						256 141					256	141
34.1	87A	3'x3'	5				116	65	116	65	116	65
34.3	88A	6'x4'	6				316	174	316	174	316	174
35.3	90A	3½'x3'	5				192	105	192	105	192	105
35.7	91A	3½'x3'	5				192	105	192	105	192	105
36.5	93A	2'x2'	4				74	41	74	41	74	41
37.1	96A	6'x4'	6	Excavation and backfill								
				46 c.y. @ $0.70 32 100 32		30" concrete pipe							
				Timber		Excavation and backfill						
				7.56 M. 36.64		46 c.y. @ $0.70 32 100 32						
				Drift bolts		24' concrete pipe (1913)						
				189 lbs 0.035 284 50 142		5.69 136 100 136						
				316 174	Same	168 168	316	174	316	174	168	168
37.4	97A	3½'x3'	5				192	105	192	105	192	105
37.7	98A	5'x3½'	5½				261	143	261	143	261	143
38.0	99A	2'x2'	4				74	41	74	41	74	41
		4½'x2½'	4			Filled	171	93	171	93		
40.3	104A	3'x2'	4				86	48	86	48	86	48
41.1	106A	4'x3'	6				227	126	227	126	227	126

42.0	107A	4'x2½'	4							167	91	167	91	167	91
42.4	108A	2'x2'	4½							79	45	79	45	79	45
									Total St. Ignace to Soo Junction	11,757	6,539	11,757	6,539	11,204	7,075
				MARQUETTE TO NESTORIA:											
	199	6'x8'	21	Arch						2,243	2,024	2,243	2,024	2,243	2,024
	200	6'x5'	11	Stone						962	810	962	810	962	810
156.0		2'x16"	16							200	135	200	135	200	135
156.1		6'x8'	16	Concrete					Excavation and backfill						
									101 c.y. @ $0.70	71	100	71			
									Concrete (1911)						
									142 c.y. 9.00	1,278		1,214			
														1,349	1,285
		2'x8"	6							1,349		1,285	70	43	70	43	70	43
157.0		16"	16										201	124	201	124	201	124
		5'x6'	20	Pole									492	337	492	337	492	337
		14'x12"	2										35	20	35	20	35	20
		16"x16"	6										72	43	72	43	72	43
		2'x16"	5										73	43	73	43	73	43
159.0		1'x10"	2										20	14	20	14	20	14
		2'x1	2										42	23	42	23	42	23
		3'x5'	12										289	172	289	172	289	172
		4'x6'	16										669	390	669	390	669	390
159.5	211	15"x16"	3										48	27	48	27	48	27
160.6	212	1'x1'	3										24	14	24	14	24	14
161.0		4'x4'	16										558	335	558	335	558	355
		4'x3'	8										278	158	278	158	278	138
		2½'x2'	5										92	64	92	64	92	64
167.0	223	6'x6'	20	Arch									1,637	842	1,637	842	1,637	842
167.0		2'x20"	5										79	46	79	46	79	46
		7'x1'	20										733	521	733	521	733	521
		12"	7										82	73	82	73	82	73
		1½'x1'	7										77	66	77	66	77	66
170.6	231	3½'x2'	4										145	79	145	79	145	79
		1'x1'	6										38	24	38	24	38	24
171.0		1½'x14'	4										54	31	54	31	54	31
172.0		2'x2'	4										74	41	74	41	74	41
		2'x2'	10										143	88	143	88	143	88
		2'x2'	5										85	72	85	72	85	72
173.0		8"	20										152	111	152	111	152	111

CULVERTS—Continued

Mile	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1913—Exhibit 1-A				1911		1912		1913	
										C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
										$	$	$	$	$	$
173.4	236	4'x3'	4							179	97	179	97	179	97
		2½'x2'	16							246	163	246	163	246	163
		3'x3'	6							132	76	132	76	132	76
174.0		2½'x2'	5							92	53	92	53	92	53
		1'x1'	3							24	14	24	14	24	14
		1'x1'	4							28	17	28	17	28	17
		2'x2'	5							85	59	85	59	85	59
		2'x4'	8							164	94	164	94	164	94
		4'x4'	18							624	379	624	379	624	379
174-178		95'x30"	18			30" concrete pipe									
						Excavation and backfill									
						191 c.y. @ $0.70	134	100	134						
						95' concrete pipe (1913)									
						5.69	541	100	541						
							675		675					675	675
		4'x3'	14							442	265	442	265	442	265
178.0		3'x2'	4							86	49	86	49	86	49
		4'x4'	10							369	210	369	210	369	210
		1'x1'	2							20	11	20	11	20	11
178.7	243	2'x2'	4							74	41	74	41	74	41
179.4	244	2'x2'	4							74	41	74	41	74	41
179.5	245	1½'x1½'	4							59	34	59	34	59	34
	248	3'x3'	5			Excavation and backfill									
						22 c.y. @ $0.70	15	100	15						
						Timber									
						2.7 M. 36.64									
						Drift bolts									
						68 lbs 0.035	101	95	96						
							116		111					116	111
181.0		1'x8"	2							18	11	18	11	18	11
181.2	251	2'x2'	3							63	34	63	34	63	34

181.6	252	4'x4'	5		Excavation and backfill 36 c.y. @ $0.70		25	100	25										
					Timber 6.15 M.	36.64													
					Drift bolts 154 lbs	0.035	231	95	219										
							256		244								256	244	
182.1	253	2'x1½'	4							66	37	66	37	66	37				
182.5	254	4'x3'	5							203	112	203	112	203	112				
182.8	255	2'x1'	3							49	28	49	28	49	28				
183.0		1½'x1'	2							37	29	37	29	37	29				
		3'x2'	5							97	82	97	82	97	82				
		2'x2'	4							74	41	74	41	74	41				
183.7	257	3½'x1'	3							105	57	105	57	105	57				
185.1	258	2'x2'	3							63	42	63	42	63	42				
185.6	259	2'x2'	3							63	42	63	42	63	42				
		1½'x1'	2							37	20	37	20	37	20				
		22"x1'	2							40	27	40	27	40	27				
		3'x2'	6							113	74	113	74	113	74				
185.9	260	2'x2'	3							63	34	63	34	63	34				
186.3	261	4'x3'	4							179	97	179	97	179	97				
		2'x2'	6							95	66	95	66	95	66				
		2'x2'	6							95	55	95	55	95	55				
		4'x4'	8							312	175	312	175	312	175				
187.3	262	4'x3'	6							214	169	214	169	214	169				
187.5	263	2½'x'2	5							95	76	95	76	95	76				
189.0		4'x2'	10							291	172	291	172	291	172				
189.5	265	2'x2'	3							63	34	63	34	63	34				
189.8	266	4'x3'	4							179	97	179	97	179	97				
189.9	268	2'x2'	3							63	34	63	34	63	34				
191.0	269	1'x3'	5	Stone						376	311	376	311	376	311				
191.3	270	2'x2'	3							63	34	63	34	63	34				
191.6	271	4'x4'	5							229	124	229	124	229	124				
191.8	272	4'x3'	5							203	112	203	112	203	112				
		4'x4'	12							430	250	430	250	430	250				
		2'x2'	14							196	129	196	129	196	129				
		20"x2'	10							137	106	137	106	137	106				
192.0		1'x10"	1							15	8	15	8	15	8				
		3½'x2'	4							145	79	145	79	145	79				
192.3	274	4'x1'	5							151	86	151	86	151	86				

Mile	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1913—Exhibit 1-A				1911		1912		1913	
										C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
										$	$	$	$	$	$
192.8	276	3½'x1'	4							122	67	122	67	122	67
193.0	277	4'x2'	5							177	98	177	90	177	98
193.8	278	4'x2'	4							156	85	156	85	156	85
193.9	279	3'x2'	4							86	49	86	49	86	49
194.2	280	4'x2'	4							156	85	156	85	156	85
-194.5	282	2'x2'	4							74	41	74	41	74	41
194.8	283	2½'x1'	3							55	31	55	31	55	31
	284	2'x1'	3							49	28	49	28	49	28
195.5	285	4'x1'	3							114	62	114	62	114	62
196.0		1'x1'	2							20	11	20	11	20	11
		2'x1'	3							49	28	49	28		
196.0		24'x18"	3			Filled Excavation and backfill									
						9 c.y. @ $0.70		6	100 6						
						Cast iron (1913)									
						1.92 tons	42.60	82	100 82						
								88	88					88	88
		2½'x2'	6							104	63	104	63	104	63
197.6	288	3½'x2'	4							145	79	145	79	145	79
		4'x2'	20							560	360	560	360	560	360
		4'x1½'	8							226	136	226	136	226	136
		15"	20							252	193	252	193	252	193
		4'x3'	8							277	158	277	158	277	158
		2'x2'	14							196	127	196	127	196	127
						Total Marquette to Nestoria (North Line)				19,805	12,958	19,805	12,950	22,240	15,333
				MARQUETTE TO WINTHROP JUNCTION (South Track):											
0.6	1B	44"	21							543	369	543	369	543	369
		42"	12							274	220	274	220	274	220
		16"	25							320	250	320	250	320	250
		15"x1'	4							47	26	47	26	47	26
		15"x1'	8							76	46	76	46	76	46

1.0		16"	12						154	92	154	92	154	92
		3'x2½'	10						181	111	181	111	181	111
		14"	12						146	88	146	88	146	88
		3'x3'	10						194	117	194	117	194	117
		2'x2'	7						107	64	107	64	107	64
		2½'x2½'	12						199	124	199	124	199	124
		1½'x2'	12						154	97	154	77	154	97
		14"	20						240	155	240	155	240	155
		4'x4½'	25						915	574	915	574	915	574
		18"	20						297	261	297	261	297	261
		18"	30						432	385	432	385	432	385
		14"	25						309	276	309	276	309	276
		12"	10						108	80	108	80	108	80
		14"	30						374	336	374	336	374	336
		18"	25						361	319	361	319	361	319
		18"	16						244	213	244	213	244	213
		12"	10						99	87	99	87	99	87
		12"	20						203	182	203	183	203	182
		18"	28						416	369	416	369	416	369
		100'x24"		24" concrete pipe										
				Excavation and backfill										
				334 c.y. @ $0.70	234	100	234							
				100' concrete pipe (1913)										
				3.80	380	100	380							
					614		614						614	614
3.7	5B	2½'x2½'	4						88	49	88	49	88	49
3.9	7B	2½'x2'	5						92	53	92	53	92	53
4.0		18"	8						146	125	146	125	146	125
4.1	8B	3'x3'	5						116	65	116	65	116	65
		9"	8						67	53	67	53	67	53
		5½'x6'	8						438	273	438	273	438	273
		1½'x1½'	6						77	54	77	54	77	54
		2'x2'	5						85	49	85	49	85	49
		1½'x1'	5						59	45	59	45	59	45
9.0		5'x2'	5						207	114	207	114	207	114
	25B	3'x2'	5	Excavation and backfill										
				28 c.y. @ $0.70	20	100	20							
				Timber										
				2.47 M. 36.64										

CULVERTS—Continued

Mile Post	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1911—Exhibit 1-A				1911		1912		1913	
										C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
										$	$	$	$	$	$
						Drift bolts									
						62 lbs	0.035	93	95 88						
								113	108					113	108
10.9	29B	3'x1'	3							61	34	61	34	61	34
	34B	1'x1'	3							24	14	24	14	24	14
	36B	4'x3'	5							203	112	203	112	203	112
		3'x3'	6							132	98	132	98	132	98
		16"x1'	3							43	24	43	24	43	24
		3'x3'	8							162	95	162	95	162	95
		3'x3'	8							162	95	162	95	162	95
		4'x4'	8							312	175	312	175	312	175
12.0		7'x3'	7							347	196	347	196	347	196
		44'x24"	10			24" concrete pipe									
						Excavation and backfill									
						48 c.y. @ $0.70		34	100 34						
						44' concrete pipe									
							3.80	167	95 159						
								201	193					201	193
		2'x1'	5							67	40	67	40	67	40
		3'x3'	16							303	195	303	195	303	195
		3'x3'	20							383	259	383	259	383	259
		1½'x1'	2							37	20	37	20	37	20
		1½'x1'	2							37	20	37	20	37	20
		1½'x1'	2							37	20	37	20	37	20
		5'x4'	6							291	160	291	160	291	160
		3½'x2½'	6							446	274	446	274	446	274
16.0		1'x1'	2							20	11	20	11	20	11
		2'x2'	2							54	29	54	29	54	29
		3'x2'								63	34	63	34	63	34
		4'x5'	2							168	87	168	87	168	87
						Total Marquette to Winthrop Junction.....				11,120	7,713	11,120	7,713	12,048	8,689

				HUMBOLDT TO REPUBLIC:									
0.0		6"x10"	1					12	7	12	7	12	7
0.1	1C	2'x2'	4					74	41	74	41	74	41
0.2	2C	2½'x1½'	4		2½'x3½'			72	41	72	41	72	41
		8"x10"	1					13	7	13	7	13	7
1.0		1'x1'	2					20	11	20	11	20	11
		1'x10"	2					19	13	19	13	19	13
		4'x3'	6					227	126	227	126	227	126
		10"x7"	1					13	7	13	7	13	7
1.7	3C	4'x4'	5					256	141	256	141	256	141
2.0		4'x3'	4					178	96	178	96	178	96
		2'x2'	3					63	34	63	34	63	34
		4'x2'	8					244	141	244	141	244	141
		3'x3'	5					116	65	116	65	116	65
3.8	4C	4'x2'	4					155	84	155	84	155	84
4.8	9C	4'x3'	5					203	112	203	112	203	112
5.0		2'x22"	5					82	47	82	47	82	47
5.3	12C	2'x2'	4					74	41	74	41	74	41
5.5	13C	4'x4'	7					284	158	284	158	284	158
		2½'x2'	7					116	69	116	69	116	69
		1'x10"	1					15	10	15	10	15	10
7.0		1'x10"	1					15	8	15	8	15	8
7.2	14C	4'x1'	3					114	62	114	62	114	62
7.3	15C	5½'x3'	4					216	117	216	117	216	117
		3'x3'	5					115	65	115	65	115	65
		8"x6"	1					12	7	12	7	12	7
		16"x14"	2					34	19	37	20	34	19
		2'x2'	4					74	41	74	41	74	41
		3'x3'	5					116	65	116	65	116	65
		4'x4'	5					229	124	229	124	229	124
						Total Humboldt to Republic		3,161	1,759	3,164	1,760	3,161	1,759
						Total Marquette to Nestoria (North Line)		19,805	12,958	19,805	12,950	22,240	15,333
						Total Marquette to Winthrop Junction (South Line)		11,120	7,713	11,120	7,713	12,048	8,628
						Total Marquette to Nestoria		34,086	22,430	34,089	22,423	37,449	25,720
				NESTORIA TO HOUGHTON:									
		4'x2½'	20					593	376	593	376	593	376
		6'x4'	25					1,088	694	1,088	694	1,088	694

Mile Post	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1913—Exhibit 1-A	1911		1912		1913	
							C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
							$	$	$	$	$	$
		14"	25									
1.0		3'x2'	25				306	203	306	203	306	203
		2½'x2½'	4				441	312	441	312	441	312
		2'x2'	4				88	49	88	49	88	49
		2½'x2½'	4				74	41	74	41	74	41
		4'x4'	6				88	55	88	55	88	55
		2½'x2½'	5				256	159	256	159	256	159
		2'x1½'	5				101	64	101	64	101	64
		2½'x2½'	4				76	50	76	50	76	50
		4½'x2½'	5				88	55	88	55	88	55
3.1	4D	4'x2'	8				200	111	200	111	200	111
4.3	8D	2'x2'	5				244	141	244	141	244	141
4.7	10D	2'x1½'	4				85	49	85	49	85	49
5.0	11D	4'x2'	5				66	37	66	37	66	37
5.5	13D	16"	4				177	98	177	98	177	98
6.0		4'x3'	10				70	38	70	38	70	38
		4'x3'	5				329	190	329	190	329	190
		3½'x3'	5				203	112	203	112	203	112
		4'x2'	3				182	100	182	100	182	100
6.9	14D	2'x2'	4				135	72	135	72	135	72
7.6	15D	4'x3'	5				74	41	74	41	74	41
7.7	16D	4'x3'	5				203	112	203	112	203	112
8.0		3'x2'	12				203	112	203	112	203	112
		4'x8'	2				199	173	199	173	199	173
10.0		8"	20				90	48	90	48	90	48
		4'x4'	18				152	139	152	139	152	139
							624	379	624	379	624	379
		42"	45	Tunnel		Tunnel for iron pipe						
				119 ft. @ $ 5.00 595 100 595		120 ft. @ $8.00 960 100 960						
				Excavation and backfill		Excavation and backfill						
				28 c.y. 0.70 20 100 20		56 c.y. 0.70 40 100 40						

				Cast iron pipe 39.956 tons	42.60	1,702	92	1566		Cast iron pipe 79.912 tons	42.60	3,404	92	3,132									
										25 cu. yds. of concrete	9.00	225	95	214									
						2,317		2,181				4,629		4,346	2,317	2,181	2,317	2,181	4,629	4,346			
		3'x4'	35												815	574	815	574	815	574			
		4'x2'	20												560	368	560	368	560	368			
		3'x1½'	20												317	259	317	259	317	259			
		20"x20"	14												174	139	174	139	174	139			
		1½'x3'	16												241	177	241	177	241	177			
		2'x2'	8												118	71	118	71	118	71			
		3'x2'	6												113	66	113	66	113	66			
		4'x5½'	18												716	425	716	425	716	425			
		2½'x1'	2												46	31	46	31	46	31			
	13.0	3'x2'	10												168	105	168	105	168	105			
		2'x1'	3												49	31	49	31	49	31			
		2'x1½'	4												66	42	66	42	66	42			
		1½'x1'	3												45	29	45	29	45	29			
		3'x3'	5												116	65	116	65	116	65			
	14.6	25D 4'x3'	6												227	126	227	126	227	126			
		2'x1½'	16												206	157	206	157	206	157			
		10"x1'	2												19	11	19	11	19	11			
	16.4	27D 5'x3½'	7												306	171	306	171	306	171			
	17.0	2'x1½'	22												294	231	294	231	294	231			
		4'x3'	14												442	315	442	315	442	315			
		1½'x3'	12												184	112	184	112	184	112			
		2'x2'	6												95	62	95	62	95	62			
		1½'x2'	6												87	56	87	56	87	56			
	17.7	29D 3'x2'	5												99	57	99	57	99	57			
	17.8	30D 2'x2'	4												74	41	74	41	74	41			
	17.9	31D 3'x2'	4												86	49	86	49	86	49			
	18.0	32D 3'x2'	4												86	49	86	49	86	49			
	18.1	33D 2'x1½'	3												56	31	56	31	56	31			
	18.2	34D 2'x2'	4												74	41	74	41	74	41			
	18.7	35D 4'x3'	12												398	300	398	300	398	300			
		2'x2'	12												169	117	169	117	169	117			
	19.9	37D 4'x1½'	4												144	79	144	79	144	79			
		1'x1'	2½												23	16	23	16	23	16			
		2'x10"	2												40	31	40	31	40	31			
		10"	8												77	75	77	75	77	75			

CULVERTS—Continued

Mile	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hanel—1912 Exhibit 15	Riggs—1913—Exhibit 1-A				1911		1912		1913	
										C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
										$	$	$	$	$	$
		2'x2'	6							96	56	96	56	96	56
		2'x2'	6							96	56	96	56	96	56
		3'x2'	5							99	69	99	69	99	69
20.0		4'x3'	5							203	170	203	170	203	170
		3'x2½'	5							108	61	108	61	108	61
		4'x4'	8							306	172	306	172	306	172
		4'x3'	5							203	170	203	170	203	170
		10"x1'	2							19	11	19	11	19	11
		3'x3'	4							102	57	102	57	102	57
21.9	40D	2'x2'	4							74	41	74	41	74	41
22.0	41D	3'x3'	5							116	65	116	65	116	65
22.0	42D	3'x3'	5							116	65	116	65	116	65
		20"	4							45	34	45	34	45	34
		8"x1'	1							14	7	14	7	14	7
		20"x16"	3							51	48	51	48	51	48
		3½'x4'	9							324	183	324	183	324	183
		3'x2'	5							99	89	99	89	99	89
		1'x1'	2							20	11	20	11	20	11
22.1	43D	3'x2'	4							86	50	86	50	86	50
2.22	44D	4'x2'	4							156	85	156	85	156	85
	45D	24'x24"	3												
						Excavation and backfill 9 c.y. @ $0.70		6	100	6						
						Cast iron pipe 3.12 tons	42.60	133	98	130						
								139		136					139	136
22.5	46D	2'x2'	5												
22.5	47D	2'x2'	4							85	49	85	49	85	49
		1'x1'	2							74	41	74	41	74	41
		4'x3'	6							20	11	20	11	20	11
24.5	48D	2'x2'	4							227	126	227	126	227	126
		4½'x4'	25							74	41	74	41	74	41
										920	585	920	585	920	585

26.0		2'x2'	25				372	261	372	261	372	261
26.0	49D	4'x2'	4				156	85	156	85	156	85
26.0	50D	2'x2'	5				85	68	85	68	85	68
26.2	52D	2'x2'	4				74	41	74	41	74	41
26.6	53D	2'x1'	3				49	28	49	28	49	28
		2'x2'	6				96	62	96	62	96	62
		1'x20"	3				47	26	47	26	47	26
		2½'x3'	6				123	70	123	70	123	70
		2½'x3'	9				167	151	167	151	167	151
		4'x4'	7				283	253	283	253	283	253
		2½'x2½'	6				114	66	114	66	114	66
		2'x2'	6				96	62	96	62	96	62
		4'x3'	6				227	126	227	126	227	126
27.0		2'x2'	5				85	49	85	49	85	49
		2'x2½'	7				117	68	117	68	117	68
		1½'x1½'	7				87	58	87	58	87	58
		1½'x1½'	8				97	66	97	66	97	66
		15"	8				110	63	110	63	110	63
27.3	54D	3'x3'	5				116	65	116	65	116	65
27.6	56D	2½'x2½'	4				80	45	80	45	80	45
28.0		2½'x1½'	6				95	72	95	72	95	72
		1'x1'	3				24	14	24	14	24	14
		2'x2'	4				74	41	74	41	74	41
		1½'x1½'	3				51	28	51	28	51	28
		1'x1'	5				33	20	33	20	33	20
		2'x2'	3				63	34	63	34	63	34
		2'x2'	6				96	56	96	56	96	56
29.0	60D	2'x1'	4				58	33	58	33	58	33
		6'x4'	7				350	195	350	195	350	195
		3'x1'	4				71	41	71	41	71	41
		4'x3'	7				252	141	252	141	252	141
		3'x3'	4				102	57	102	57	102	57
31.0		3'x2'	4				86	49	86	49	86	49
		3'x2'	4				86	49	86	49	86	49
		3'x2'	5				99	57	99	57	99	57
		4'x3'	5				203	112	203	112	203	112
		3'x2'	6				113	66	113	66	113	66
31.9	62D	4'x3'	5				203	112	203	112	203	112
32.0		2'x2'	5				85	49	85	49	85	49
		3'x1½'	5				90	54	90	54	90	54
		3'x3'	5				116	68	116	68	116	68

CULVERTS—Continued

Mile	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1911—Exhibit 1-A				1911		1912		1913	
										C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
										$	$	$	$	$	$
		3'x2'	8							139	84	139	84	139	84
32.4	63D	3'x3'	5							116	65	116	65	116	65
41.0		4'x3'	6							227	126	227	126	227	126
		4'x4'	6			Excavation and backfill									
						36 c.y. @ $0.70		25	100	25					
						Timber									
						6.15 M.	36.64								
						Drift bolts									
						154 lbs	0.035	231	100	231					
								256		256				256	256
		2'x2'								107	70	107	70	107	70
		2'x3'	5							102	102	102	102	102	102
		3'x3'	6							132	132	132	132	132	132
		4'x3½'	6							241	133	241	133	241	133
		2'x2'	4							74	41	74	41	74	41
		2'x2'	5							85	49	85	49	85	49
41.8	97D	3'x3'	5							116	65	116	65	116	65
42.7	98D	4'x3'	5							203	112	203	112	203	112
		4'x4'	7							283	157	283	157	283	157
		14"	9							115	104	115	104	115	104
		2'x2'	6							96	56	96	56	96	56
		4'x3'	6							227	126	227	126	227	126
		4'x3'	10							330	191	330	191	330	191
		2'x2'	5							85	49	85	49	85	49
		3'x2'	5							99	57	99	57	99	57
		2'x2'	4							74	41	74	41	74	41
43.0		3'x3'	6							132	76	132	76	132	76
		2'x2'	6							96	56	96	56	96	56
		4'x4'	9							341	193	341	193	341	193
		3'x2'	12							199	127	199	127	199	127
43.2	99D	4'x3'	5							203	112	203	112	203	112
43.9	100D	4'x1½'	4							144	79	144	79	144	79

44.0		14"	8				104	72	104	72	104	72
		6'x3'	10				418	243	418	243	418	243
		3'x2'	5				99	57	99	57	99	57
		1'x1'	2				20	11	20	11	20	11
		3'x3'	6				132	76	132	76	132	76
45.0		4'x3'	7				252	141	252	141	252	141
		4'x3'	6				227	126	227	126	227	126
		2'x2'	5				85	49	85	49	85	49
46.0	102D	4'x4'	6				256	141	256	141	256	141
47.0		2'x2'	7				107	64	107	64	107	64
		4'x2½'	14				417	378	417	378	417	378
47.8	103D	3'x2'	4				86	49	86	49	86	49
						Total Nestoria to Houghton	30,315	19,924	30,315	19,924	33,022	22,481
				NESTORIA TO STATE LINE:								
201.0		3'x3'	12		3'x2'		229	142	229	142	229	142
		1'x6"	2		1'x6'		17	10	17	10	17	10
		4'x3'	10				330	230	330	230	330	230
203.0	292	3'x2'	4				86	49	86	49	86	49
203.0		15"	8				110	99	110	99	110	99
		15"	8				110	99	110	99	110	99
		3'x2'	5				99	84	99	84	99	84
204.8	294	4'x2'	8				244	141	244	141	244	141
204.8	294½	4'x4'	24				838	528	838	528	838	528
205.0		4'x3'	5				203	170	203	170	203	170
		2'x2'	6				100	66	100	66	100	66
206.0		2'x2'	10				143	97	143	97	143	97
		2'x2'	8				119	80	119	80	119	80
207.0		3½'x2½'	6				200	126	200	126	200	126
		1½'x2'	5				77	49	77	49	77	49
		1½'x2'	4				67	42	67	42	67	42
		3½'x2½'	8				245	157	245	157	245	157
		2'x2'	6				100	66	100	66	100	66
		2'x2'	6				100	66	100	66	100	66
		2'x2'	5				85	55	85	55	85	55
		4'x2'	12				340	227	340	227	340	227
		5½'x3'	6		3½'x3'		274	152	274	152	274	152
		3'x2'	4				86	49	86	49	86	49
210.0		4'x3'	4				179	110	179	110	179	110
		3'x2'	4				86	55	86	55	86	55
		4'x3'	6				227	142	227	142	227	142

CULVERTS—Continued

Mile Post	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1911—Exhibit 1-A	1911		1912		1913	
							C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
							$	$	$	$	$	$
		3'x2'	5				99	64	99	64	99	64
		2½'x3'	10				182	110	182	110	182	110
212.0		4'x2'	10				291	205	291	205	291	205
		2'x1'	2½				46	25	46	25	46	25
		6'x2'	4				202	125	202	125	202	125
		3'x2'	6				113	66	113	66	113	66
		6'x4'	8				385	216	385	216	385	216
214.0		4'x3'	5				203	112	203	112	203	112
		3'x2'	10				168	105	168	105	168	105
215.0		3'x2'	15				249	164	249	164	249	164
		2'x2'	4				74	47	74	47	74	47
		3'x3'	12				229	142	229	142	229	142
216.0		4'x2½'	12				363	240	363	240	363	240
		3½'x2'	8				229	132	229	132	229	132
		3½'x2½'	14				393	263	393	263	393	263
		4'x2½'	9				285	165	285	165	285	165
		1½'x1'	2				37	23	37	23	37	23
		3'x3'	7				147	96	147	96	147	95
218.0		3½'x3½'	6				229	142	229	142	229	142
		16"	14				176	137	176	137	176	137
		2'x2'	12				169	124	169	124	169	124
		1½'x1½'	6				68	55	68	55	68	55
220.0		18"	10				146	84	146	84	146	84
220.6	301	4'x4'	39				1,457	985	1,457	985	1,457	985
221.0		3'x2'	7				126	75	126	75	126	75
		4'x2½'	6				213	145	213	145	213	145
		2½'x2'	12				184	117	184	117	184	117
		3'x2'	6				113	96	113	96	113	96
222.0		4'x2'	9				267	160	267	160	267	160
		12"	5				65	36	65	36	65	36
		4'x3'	10				330	197	330	197	330	197
224.0		4'x2'	3		4'x3'		134	72	134	72	134	72
		4'x2'	4				156	105	156	105	156	105

	302													
224.5	303	4′x4′	14		Concrete arch, 20′ span, 12′ rise, 122′ long, 1,023 c. y.—actual cost							13,576	13,576	
	304					493	291	493	291	493	291			
					Concrete box, 8′ span, 6′ deep, 92′ long, 320 c. y.—actual cost							4,760	4,760	
228.0		16″	22			278	250	278	250	278	250			
		4′x3′	25			795	593	795	593	795	593			
229.4	305	6′x6′	40			2,277	1,484	2,277	1,484	2,277	1,484			
230.0		16″	20			266	211	266	211	266	211			
		3′x2′	5			99	84	99	84	99	84			
		1′x1′	4			29	18	29	18	29	18			
		16″	10			135	119	135	119	135	119			
		16″	10			135	119	135	119	135	119			
		2′x2′	4	Log		60	35	60	35	60	35			
		6′x4′	18			721	589	721	589	721	589			
230.6	306	4′x3′	17			532	327	532	327	532	327			
231.0		16″	23			284	256	284	256	284	256			
		16″	14			179	159	179	159	179	159			
		11″	10			103	80	103	80	103	80			
231.7	307	5′x2½′	32	Double		1,398	709	1,398	709	1,398	709			
232.0		1′x1′	15			94	69	94	69	95	69			
		2½′x4′	18			360	297	360	297	360	297			
		2′x2′	5			85	49	85	49	85	49			
		1′x1′	5			33	20	33	20	33	20			
		4½′x6′	14			616	355	616	355	616	355			
		4′x2′	10			291	177	291	177	291	177			
233.0		2′x1′	2			42	23	42	23	42	23			
		2½′x2′	2			58	31	58	31	58	31			
		3′x3′	4			102	58	102	58	102	58			
		4′x3′	6			227	126	227	126	227	126			
		12″	8			90	53	90	53	90	53			
		1′x1′	2			20	11	20	11	20	11			
234.0		3½′x3′	18			263	149	263	149	263	149			
		15″	28			364	243	364	243	364	243			
		4′x2½′	12			363	216	363	216	363	216			
		9″	8			67	53	67	53	67	53			
		12″	10			108	84	108	84	108	84			
235.0		3′x2′	8			139	86	139	86	139	86			
		3′x2′	8			139	86	139	86	139	86			
236.0		4′x2′	8			243	140	243	140	243	140			
		1½′x1½′	8			97	60	97	60	97	60			

CULVERTS—Continued

Mile Post	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1913—Exhibit 1-A	1911		1912		1913	
							C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
							$	$	$	$	$	$
		20"	14				230	203	230	203	230	203
		6"x10"	2				16	13	16	13	16	13
237.3	311	4'x4'	18				624	379	624	379	624	379
238.0		2½'x2'	10				143	93	143	93	143	93
		1'x1'	4				30	19	30	19	30	19
		2½'x2½'	10				169	114	169	114	169	114
		1'x1'	2				20	11	20	11	20	11
		3'x2½'	6				122	71	122	71	122	71
		3'x3'	6				132	76	132	76	132	76
		3'x2'	4				86	73	86	73	86	73
239.0		2½'x3'	8				152	99	152	99	152	99
240.0		3'x2½'	14				249	163	249	163	249	163
		1'x1'	2				20	14	20	14	20	14
		4'x3'	5				203	115	203	115	203	115
		3'x2'	10				168	105	168	105	168	105
		16"	18				225	165	225	165	225	165
		1½'x1'	7				76	47	76	47	76	47
		1'x1'	5				35	22	35	22	35	22
		2'x1½'	6				86	51	86	51	86	51
		2'x2'	12				169	132	169	132	169	132
		3'x2'	8				135	82	135	82	135	82
241.2	313	5'x4'	36				1,506	1,007	1,506	1,007	1,506	1,007
242.0		3'x1½'	4				79	46	79	46	79	46
		22"x1'	2				40	22	40	22	40	22
		16"	12				199	118	199	118	199	118
		5½'x2'	16				550	350	550	350	550	350
		3'x2'	11				184	119	184	119	184	119
		16"	10				135	81	135	81	135	81
242.0		1'x1'	21				20	11	20	11	20	11
243.0		4'x2½'	16				474	409	474	409	474	409
		14"	12				146	127	146	127	146	127
		14"	12				146	127	146	127	146	127

244.0	315	5'x6'	45	Excavation and backfill 1,087 c.y. @ $0.70	761	100	761										
				Timber 39.64 M. @ 36.64													
				Drift bolts 991 lbs	0.03½	1,487	50	744									
						2,248		1,505	Same	6' concrete pipe, 204' long—actual cost	2,248	1,505	2,248	1,505	7,000	7,000
	316									16' circular arch, 71'-10" long, 609 c. y. concrete—actual cost					6,500	6,500
		5'x2'	16								522	379	522	379	522	379
		1'x1'	3								24	14	24	14	24	14
		4'x2'	6								198	136	198	136	198	136
		1'x1'	4								29	18	29	18	29	18
		1'x1'	2								20	11	20	11	20	11
245.0		16"	6								89	50	89	50	89	50
246.0		2'x2'	5								85	55	85	55	85	55
		1'x1'	3								24	14	24	14	24	14
		3'x2'	5								99	64	99	64	99	64
		4'x2½'	8								260	167	260	167	260	167
		3½'x2½'	6								122	79	122	79	122	79
247.0		3'x2'	5								99	64	99	64	99	64
		4'x3'	8								278	158	278	158	278	158
		4'x3'	8								278	177	278	177	278	177
		2'x2'	5								85	72	85	72	85	72
		1½'x1'	1								30	15	30	15	30	15
		4½'x2'	10								309	188	309	188	309	188
248.0		1'x10"	4								27	16	27	16	27	16
249.0		5½'x3'	11								432	253	432	253	432	253
		14"	8								104	60	104	60	104	60
		2'x2½'	7								117	82	117	82	117	82
		3'x2'	6								113	66	113	66	113	66
250.0		6'x2½'	11								431	262	431	262	431	262
		16"	25								325	294	325	294	325	294
251.0		1'x1'	2								20	11	20	11	20	11
		2½'x3'	6								123	104	123	104	123	104
		4½'x2'	3								142	79	142	79	142	79
252.2	318	6'x8'	26	Arch							2,645	1,664	2,645	1,664	2,645	1,664
		2'x2'	3								63	36	63	36	63	36
		4'x3'	7								252	141	252	141	252	141
		3'x2'	10								168	105	168	105	168	105

CULVERTS—Continued

Mile	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1913—Exhibit 1-A	1911		1912		1913	
							C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
							$	$	$	$	$	$
255.0		3'x2'	3				75	42	75	42	75	42
		20"	10				175	154	175	154	175	154
		4'x2'	30				883	602	883	602	883	602
		1'x2'	2				44	23	44	23	44	23
		1'x10"	1½				17	10	17	10	17	10
256.0			13	4'x3' and 5'x3'			452	269	452	269	452	269
		13"	6				79	44	79	44	79	44
257.0	320	5'x4'	12			Included in trestle schedule	489	284	489	284		
		2'x2'	5				85	85	85	85	85	85
		3'x3'	6				132	132	132	132	132	132
258.0		2'x2'	5				85	85	85	85	85	85
259.0		3'x2'	5				137	137	137	137	137	137
259.7	321	4'x3'	9	Double			492	249	492	249	492	249
260.0		1'x1'	4				29	18	29	18	29	18
260.1	322	4'x3'	11	Double			565	286	565	286	565	286
		3'x3'	5				116	116	116	116	116	116
		1'x1'	5				33	22	33	22	33	22
		3'x3'	5				116	74	116	74	116	74
		2'x1'	3				49	31	49	31	49	31
		3'x3'	5				116	65	116	65	116	65
		16"x1'	4				50	29	50	29	50	29
		3'x3'	7				147	86	147	86	147	86
		3'x2'	3				75	42	75	42	75	42
262.0		2'x1'	3				49	28	49	28	49	28
		2'x2'	5				85	55	85	55	85	55
		1½'x8"	7				70	48	70	48	70	48
		1'x1'	2				20	11	20	11	20	11
		16"	8				129	113	129	113	129	113
		20"	9				173	152	173	152	173	152
264.0		16"	16				217	193	217	193	217	193
		2'x2½'	14				213	147	213	147	213	147
		2'x2½'	12				184	126	184	126	184	126

		2½'x2½'	8			85	49	85	49	85	49	
266.0		2'x2'	6			454	261	454	261	454	261	
267.0	325	5'x4'	11		3'x4'	85	68	85	68	85	68	
		2'x2'	5			74	41	74	41	74	41	
268.0		2'x2'	4			63	39	63	39	63	39	
269.0		2'x2'	3			179	110	179	110	179	110	
270.0		4'x3'	4			179	110	179	110	179	110	
		4'x3'	4			89	49	89	49	89	49	
		2'x3'	4			179	97	179	97	179	97	
271.0		4'x3'	4			80	55	80	55	80	55	
		2½'x2'	4			33	24	33	24	33	24	
		1'x1'	5			23	14	23	14	23	13	
		1'x10"	3			36	23	36	23	36	23	
		1'x10"	6			229	141	229	141	229	141	
		4'x4'	5			139	84	139	84	139	84	
272.0		3'x2'	8			167	91	167	91	167	91	
273.6	328	4'x2½'	4			85	55	85	55	85	55	
274.0		2'x2'	5			151	135	151	135	151	135	
		3'x4'	6			147	111	147	111	147	111	
		20"	9			84	72	84	72	84	72	
		14"	6			84	72	84	72	84	62	
281.0		14"	6			86	49	86	49	86	49	
283.0		3'x2'	4			331	192	331	192	331	192	
283.2	334	4'x3'	10			86	49	86	49	86	49	
		3'x2'	4			132	78	132	78	132	78	
		3'x3'	6			227	142	227	142	227	142	
287.0		4'x3'	6			81	46	81	46	81	46	
		2'x2½'	4			202	158	202	158	202	158	
		6'x2'	4			132	105	132	105	132	105	
289.0		3'x3'	6			162	95	162	95	162	95	
		3'x3'	8			1,432	724	1,432	724	1,432	724	
289.7	337	5'x5'	25	Double		201	158	201	158	201	158	
290.0		16"	16			155	114	155	114	155	114	
		3'x1½'	10			77	57	77	57	77	57	
		1½'x2'	5			45	33	45	33	45	33	
291.0		1½'x1'	3			502	313	502	313	502	313	
291.3	339	3½'x2½'	18			66	37	66	37	66	37	
		2'x1½'	4			99	57	99	57	99	57	
		3'x2'	5			75	51	75	51	75	51	
293.0		3'x2'	3			20	11	20	11	20	11	
		1'x1'	2									

CULVERTS—Continued

Mile	Bridge No.	Size	Fill Feet	Riggs—1911—Exhibit 1	Hansel—1912 Exhibit 15	Riggs—1911—Exhibit 1-A	1911		1912		1913	
							C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
							$	$	$	$	$	$
		2'x2'	10				143	104	143	104	143	104
293.4	341	4'x2'	20				560	360	560	360	560	360
		2'x2'	5				85	59	85	59	85	59
		3'x3'	5				116	80	116	80	116	80
294.0		3'x2'	5				99	69	99	69	99	69
		3'x3'	8				162	95	162	95	162	95
		3'x2'	4				86	50	86	50	86	50
295.0	343	4'x2'	20				560	360	560	360	560	360
297.0		2'x2'	6				96	56	96	56	96	56
		3'x3'	16				303	199	303	199	303	199
		2'x2'	5				85	59	85	59	85	59
		3'x2½'	6				122	71	122	71	122	71
299.0		3'x3'	6				132	76	132	76	132	76
300.0		3'x3'	5				116	65	116	65	116	65
		3'x3'	5				116	65	116	65	116	65
		4'x3'	5				202	111	202	111	202	111
				BESSEMER JUNCTION TO BESSEMER:								
		1'x1'	1				16	9	16	9	16	9
		2'x2'	5				85	49	85	49	85	49
						Total Nestoria to State Line	55,698	36,419	55,698	36,500	84,797	66,466

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS

Schedule No. 5
OPEN CULVERTS

Mile Post	Bridge No.	Lgth. Ft.	Fill Ft.	Riggs—1911—Exhibit 1			Hansel—1913—Exhibit 15			Riggs—1913—Exhibit 1-A	1911			1912			1913		
											C. R.	%	P. V.	C. R.	%	P. V.	C. R.	%	P. V.
SAULT STE. MARIE TO MARQUETTE:											$		$	$		$	$		$
35.4	12	9½	6	Piling	132 lin. ft.	@ $0.40	Piling	132 lin. ft.	@$ 0.40	Replaced	53	50	26	53					
				Timber	2.02 M.B.M.	43.64	Timber	2.04 M.B.M.	43.00		88	50	44	87					
				Wrought iron	315 lbs														
				Cast Iron	54 lbs														
				Total iron	369 lbs	0.035	Iron	350 lbs	0.035		13	60	8	12					
				Bridge Ties (0.53 M.B.M.)	11	2.0875	Bridge ties	0.48 M.B.M.	34.00		23	50	12	16					
											177		90	168	50	84			
52.0	30	12	5	Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Replaced	53	50	26	53					
				Timber	2.08 M.B.M.	43.64	Timber	2.22 M.B.M.	43.00		91	50	46	95					
				Wrought iron	311 lbs														
				Cast iron	54 lbs														
				Total Iron	365 lbs	0.035	Iron	355 lbs	0.035		13	72	9	12					
				Bridge Ties (0.62 M.B.M.)	13	2.0875	Bridge ties	0.60 M.B.M.	34.00		27	50	14	20					
											184		95	180	50	90			
52.4	31	13	5	Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Replaced	53	52	28	53					
				Timber	2.52 M.B.M.	43.64	Timber	2.30 M.B.M.	43.00		110	50	55	99					
				Wrought iron	311 lbs														
				Cast Iron	54 lbs														
				Total iron	365 lbs	0.035	Iron	360 lbs	0.035		13	76	10	12					
				Bridge ties (0.67 M.B.M.)	14	2.0875	Bridge ties	0.65 M.B.M.	34.00		29	50	14	22					
											205		107	186	50	93			

53.7	32	8	4	Piling	132 lin. ft.	0.40		Piling	132 lin. ft.	0.40		Replaced	53	60	32	53										
				Timber	1.70 M.B.M.	43.64		Timber	1.89 M.B.M.	43.00			74	50	37	81										
				Wrought iron	285 lbs																					
				Cast iron	54 lbs																					
				Total Iron	339	0.035		Iron	348 lbs	0.035			12	80	10	12										
				Bridge ties (0.43 M.B.M.)	9	2.0875		Bridge ties	0.40 M.B.M.	34.00			19	50	10	14										
													158		89	160	50	80							
54.0	34	8	4	Piling	132 lin.ft.	0.40		Piling	132 lin. ft.	0.40		Replaced	53	60	32	53										
				Timber	1.70 M.B.M.	43.64		Timber	1.89 M.B.M.	43.00			74	50	37	81										
				Wrought Iron	285 lbs																					
				Cast iron	54 lbs																					
				Total iron	339 lbs	0.035		Iron	348 lbs	0.035			12	80	10	12										
				Bridge ties (0.43 M.B.M.)	9	2.0875		Bridge ties	0.40 M.B.M.	34.00			19	50	10	14										
													158		89	160	50	80							
59.1	44	8	7	Piling	132 lin. ft.	0.40		Piling	132 lin. ft.	0.40		Replaced	53	50	26	53										
				Timber	2.02 M.B.M.	43.64		Timber	1.93 M.B.M.	43.00			88	50	44	83										
				Wrought iron	325 lbs																					
				Cast iron	54								13	68	8	12										
				Total iron	379	0.035		Iron	348 lbs	0.035			19	50	10	14										
				Bridge ties (0.43 M.B.M.)	9	2.0875		Bridge ties	0.40 M.B.M.	34.00																
													173		81	162	50	81							
60.1	50	10	6	Piling	132 lin. ft. @	$0.40		Piling	132 lin.ft. @	$0.40		Replaced	53	50	26	53										
				Timber	2.02 M.B.M.	43.64		Timber	2.62 M.B.M.	43.00			88	50	44	113										
				Wrought iron	315 lbs																					
				Cast iron	54 lbs																					
				Total iron	369 lbs	0.035		Iron	352 lbs	0.035			13	62	8	12										
				Bridge ties (0.53 M.B.M.)	11	2.0875		Bridge ties	0.50 M.B.M.	34.00			23	50	12	17										
													177		90	195	50	98							

OPEN CULVERTS—Continued

Mile Post	Bridge No.	Lgth. Ft.	Fill Ft.	Riggs—1911—Exhibit 1			Hansel—1913—Exhibit 15			Riggs—1913—Exhibit 1-A	1911 C. R.	1911 %	1911 P. V.	191 C. R.	191 %	191 P. V.	1913 C. R.	1913 %	1913 P. V.
											$		$	$		$	$		$
60.3	51	8	7	Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Replaced	53	50	26	53					
				Timber	2.02 M.B.M.	43.64	Timber	2.47 M.B.M.	43.00		88	50	44	106					
				Wrought Iron	325 lbs														
				Cast iron	54 lbs														
				Total iron	379 lbs	0.035	Iron	348 lbs	0.035		13	60	8	12					
				Bridge ties (0.43 M.B.M.)	9	2.0875	Bridge ties	0.40 M.B.M.	34.00		19	50	10	14					
											173		88	185	50	93			
61.0	54	13½	4	Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Replaced	53	50	26	53					
				Timber	2.40 M.B.M.	43.64	Timber	2.33 M.B. M.	43.00		105	50	52	100					
				Wrought iron	306 lbs														
				Cast iron	54 lbs														
				Total iron	360 lbs	0.035	Iron	360 lbs	0.035		13	66	8	13					
				Bridge ties (0.72 M.B.M.)	15	2.0875	Bridge ties	0.68 M.B.M.	34.00		31	50	16	23					
											202		102	189	50	95			
80.1	95	15	6	Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Total as per Exhibit 1	53	50	26	53			224		113
				Timber	2.85 M.B.M.	43.64	Timber	2.48 M.B.M.	43.00		124	50	62	107					
				Wrought iron	356 lbs														
				Cast iron	68 lbs														
				Total iron	424 lbs	0.035	Iron	365 lbs	0.035		14	70	9	13					
				Bridge ties (0.78 M.B.M.)	16	2.0875	Bridge ties	0.75 M.B.M.	34.00		33	50	16	26					
											224		113	199	50	100	224		113

80.5	96	14½	6	Piling	132 lin. ft.	0.40		Piling	132 lin. ft.	0.40	Total as per Exhibit 1	53	50	26	53			224		113					
				Timber	2.85 M.B.M.	43.64		Timber	2.44 M.B.M.	43.00		124	50	62	105										
				Wrought iron	356 lbs																				
				Cast iron	68 lbs																				
				Total iron	424 lbs	0.035		Iron	362 lbs	0.035		14	70	9	13										
				Bridge ties (0.78 M.B.M.)	16	2.0875		Bridge ties	0.73 M.B.M.	34.00		33	50	16	25										
												224		113	196	50	98	224		113					
97.9	139	15	4	Piling	132 lin. ft.	0.40		Piling	132 lin. ft.	0.40	Total as per Exhibit 1	53	50	26	53			215		109					
				Timber	2.65 M.B.M.	43.64		Timber	2.45 M.B.M.	43.00	Add Timber														
				Wrought iron	308 lbs						0.749 M.B.M. $42.00	116	50	58	105			33	95	31					
				Cast iron	68 lbs																				
				Total iron	376 lbs	0.035		Iron	365 lbs	0.035		13	70	9	13										
				Bridge ties (0.78 M.B.M.)	16	2.0875		Bridge ties	0.75 M.B.M.	34.00		33	50	16	26										
												215		109	197	50	99	248		140					
103.5	147	8	5	Piling	132 lin. ft.	$0.40		Piling	132 lin. ft. @	$0.40	Replaced	53	60	32	53										
				Timber	1.83 M.B.M.	43.64		Timber	1.90 M.B.M.	43.00		80	50	40	82										
				Wrought iron	301 lbs																				
				Cast iron	54 lbs																				
				Total iron	355 lbs	0.035		Iron	348 lbs	0.035		13	80	11	12										
				Bridge ties (0.43 M.B.M.)	9	2.0875		Bridge ties	0.40 M.B.M.	34.00		19	50	10	14										
												165		93	161	50	81								
152.1	194	8	3⅕	Piling	132 lin. ft.	0.40		Piling	132 lin. ft.	0.40	Total as per Exhibit 1	53	50	26	53			158		80					
				Timber	1.7 M.B.M.	43.64		Timber	1.88 M.B.M.	43.00		74	50	37	81										
				Wrought iron	285 lbs																				
				Cast iron	54 lbs																				
				Total iron	339 lbs	0.035		Iron	350 lbs	0.035		12	58	7	12										
				Bridge ties (0.43 M.B.M.)	9	2.0875		Bridge ties	0.40 M.B.M.	34.00		19	50	10	14										
												158		80	160	50	80	158		80					

Mile Post	Bridge No.	Lgth. Ft.	Fill Ft.	Riggs—1911—Exhibit 1			Hansel—1913—Exhibit 15			Riggs—1913—Exhibit 1-A	1911 C. R.	1911 %	1911 P. V.	1912 C. R.	1912 %	1912 P. V.	1913 C. R.	1913 %	1913 P. V.
											$		$	$		$	$		$
152.3	195	8	6	Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Total as per Exhibit 1	53	50	26	53			167		84
				Timber	1.89 M.B.M.	43.64	Timber	1.92 M.B.M.	43.00		82	50	41	83					
				Wrought iron	309 lbs														
				Cast iron	54 lbs														
				Total iron	363 lbs	0.035	Iron	350 lbs	0.035		13	58	7	12					
				Bridge ties (0.43 M.B.M.)	9	2.0875	Bridge ties	0.40 M.B.M.	34.00		19	50	10	14					
											167		84	162	50	81	167		84
				Total Sault Ste. Marie to Marquette							2,760		1,430	2,660		1,333	1,021		530
				ST. IGNACE TO SOO JUNCTION															
24.0	56A	10		Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Replaced	53	50	26	53					
				Timber	1.83 M.B.M.	43.64	Timber	2.06 M.B.M.	43.00		80	50	40	89					
				Wrought iron	291 lbs														
				Cast iron	54 lbs														
				Total iron	345 lbs	0.035	Iron	352 lbs	0.035		12	72	8	12					
				Bridge ties (0.53 M.B.M.)	11	2.0875	Bridge ties	0.50 M.B.M.	34.00		23	50	12	17					
											168		86	171	50	86			
24.2	58A	12		Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Replaced	53	50	26	53					
				Timber	1.96 M.B.M.	43.64	Timber	2.22 M.B.M.	43.00		86	50	43	95					

				Wrought iron	295 lbs															
				Cast iron	54 lbs															
				Total iron	349 lbs	0.035	Iron	355 lbs	0.035				12	72	8	12				
				Bridge ties (0.62 M.B.M.)	13	2.0875	Bridge ties	0.60 M.B.M.	34.00				27	50	14	20				
													178		91	180	50	90		
25.0	60A	12		Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Replaced			53	50	26	53				
				Timber	1.96 M.B.M.	43.64	Timber	2.22 M.B.M.	43.00				86	50	43	95				
				Wrought iron	295 lbs															
				Cast iron	54 lbs															
				Total iron	349 lbs	0.035	Iron	355 lbs	0.035				12	72	8	12				
				Bridge ties (0.62 M.B.M.)	13	2.0875	Bridge ties	0.60 M.B.M.	34.00				27	50	14	20				
													178		91	180	50	90		
			No. Bents																	
29.3	71A	9		Piling	132 lin. ft. @	$0.40	Piling	132 lin. ft. @	$0.40	Replaced			53	50	26	53				
				Timber	1.76 M.B.M.	43.64	Timber	1.98 M.B.M.	43.00				77	50	38	85				
				Wrought iron	291 lbs															
				Cast iron	54 lbs															
				Total iron	345 lbs	0.035	Iron	350 lbs	0.035				12	72	8	12				
				Bridge ties (0.48 M.B.M.)	10	2.0875	Bridge ties	0.45 M.B.M.	34.00				21	50	10	15				
													163		82	165	50	83		
33.0	85A	10		Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Replaced			53	50	26	53				
				Timber	1.83 M.B.M.	43.64	Timber	2.06 M.B.M.	43.00				80	50	40	89				
				Wrought iron	291 lbs															
				Cast iron	54 lbs															
				Total iron	345 lbs	0.035	Iron	352 lbs	0.035				12	72	8	12				
				Bridge ties (0.53 M.B.M.)	11	2.0875	Bridge ties	0.50 M.B.M.	34.00				23	50	12	17				
													168		86	171	50	86		

Mile Post	Bridge No.	Lgth. Ft.	No. Bents	Riggs—1911—Exhibit 1			Hansel—1913—Exhibit 15			Riggs—1913—Exhibit 1-A	1911 C. R.	1911 %	1911 P. V.	1912 C. R.	1912 %	1912 P. V.	1913 C. R.	1913 %	1913 P. V.
											$		$	$		$	$		$
33.3	86A	10		Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Replaced	53	50	26	53					
				Timber	1.83 M.B.M.	43.64	Timber	2.06 M.B.M.	43.00		80	50	40	89					
				Wrought iron	291 lbs														
				Cast iron	54 lbs														
				Total iron	345 lbs	0.035	Iron	352 lbs	0.035		12	72	8	12					
				Bridge ties (0.53 M.B.M.)	11	2.0675	Bridge ties	0.50 M.B.M.	34.00		23	50	12	17					
											168		86	171	50	86			
				Total St. Ignace to Soo Junction							1,023		522	1,038		521			
				Total Sault Ste. Marie to Marquette							2,760		1,430	2,660		1,333	1,021		530
				Total East of Marquette							3,783		1,952	3,698		1,854	1,021		530
MARQUETTE TO NESTORIA (North Line)																			
Marquette	201	7 Yard	7	Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Total as per Exhibit 1	53	50	26	53			109		85
				Timber	1.96 M.B.M.	43.64	Timber	1.84 M.B.M.	43.00		86	50	43	79					
				Wrought iron	325 lbs														
				Cast iron	54 lbs														
				Total iron	379 lbs	0.035	Iron	345 lbs	0.035		13	62	8	12					
				Bridge ties (0.38 M.B.M.)	8	2.0675	Bridge ties	0.35 M.B.M.	34.00		17	50	8	12					
											169		85	156	50	78	109		85
156.1	202	13	8	Piling	132 lin. ft.	0.40	Replaced			Replaced	53	50	26						
				Timber	2.70 M.B.M.	43.64					118	50	59						
				Wrought iron	354 lbs														

				Cast iron	54 lbs																
				Total iron	408 lbs	0.035							14	62	8						
				Bridge ties (0.67 M.B.M.)	14	2.0875							29	50	14						
													214		107						
	162.5	213	6	3½	Piling	132 lin ft. @	$0.40	Piling	132 lin. ft.	0.40	Filled		53	50	26	53					
					Timber	1.64 M.B.M.	43.64	Timber	1.72 M.B.M.	43.00			72	50	36	74					
					Wrought iron	285 lbs															
					Cast iron	54 lbs															
					Total iron	339 lbs	0.035	Iron	345 lbs	0.035			12	62	7	12					
					Bridge ties (0.34 M.B.M.)	7	2.0875	Bridge ties	0.30 M.B.M.	34.00			15	50	8	10					
													152		77	149	50	75			
	170.8	232	8	3	Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Total as per Exhibit 1		53	50	26	53			158		80
					Timber	1.70 M.B.M.	43.64	Timber	1.88 M.B.M.	43.00			74	50	37	81					
					Wrought iron	285 lbs															
					Cast iron	54 lbs															80
					Total iron	339 lbs	0.035	Iron	348 lbs	0.035			12	62	7	12					
					Bridge ties (0.43 M.B.M.	9	2.0875	Bridge ties	0.40 M.B.M.	34.00			19	50	10	14					
													158		80	160	50	80	158		80
	171.3	235	8		Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Total as per Exhibit 1		53	50	26	53			158		80
					Timber	1.70 M.B.M.	43.64	Timber	1.90 M.B.M.	43.00			74	50	37	82					
					Wrought iron	285 lbs															
					Cast iron	54 lbs															
					Total iron	339 lbs	0.035	Iron	348 lbs	0.035			12	62	7	12					
					Bridge ties (0.43 M.B.M.)	9	2.0875	Bridge ties	0.40 M.B.M.	34.00			19	50	10	14					
													158		80	161	50	81	158		80

OPEN CULVERTS—Continued

Mile Post	Bridge No.	Lgth. Ft.	No. Bents	Riggs—1911—Exhibit 1			Hansel—1913—Exhibit 15			Riggs—1913—Exhibit 1-A	1911			1912			1913		
											C. R.	%	P. V.	C. R.	%	P. V.	C. R.	%	P. V
											$		$	$		$	$		$
179.8	248	8		Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Replaced	53	50	26	53					
				Timber	1.70 M.B.M.	43.64	Timber	1.90 M.B.M.	43.00		74	50	37	82					
				Wrought iron	285 lbs														
				Cast iron	54 lbs														
				Total iron	339 lbs	0.035	Iron	348 lbs	0.035		12	50	6	12					
				Bridge ties (0.43 M.B.M.)	9	2.0875	Bridge ties	0.40 M.B.M.	34.00		19	50	10	14					
											158		79	161	50	81			
181.0	250	10		Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Replaced	53	50	26	53					
				Timber	1.83 M.B.M.	43.64	Timber	2.06 M.B.M.	43.00		80	50	40	89					
				Wrought iron	291 lbs														
				Cast iron	54 lbs														
				Total iron	345 lbs	0.035	Iron	352 lbs	0.035		12	72	8	12					
				Bridge ties (0.53 M.B.M.)	11	2.0875	Bridge ties	0.50 M.B.M.	34.00		23	50	12	17					
											168		86	171	50	86			
181.6	252	5		Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Replaced	53	50	26	53					
				Timber	1.64 M.B.M.	43.64	Timber	1.65 M.B.M.	43.00		72	50	36	71					
				Wrought iron	285 lbs														
				Cast iron	54 lbs														
				Total iron	339 lbs	0.035	Iron	341 lbs	0.035		12	66	8	12					
				Bridge ties (0.29 M.B.M.)	6	2.0875	Bridge ties	0.25 M.B.M.	34.00		13	50	6	9					
											150		76	145	50	73			

MARQUETTE TO WINTHROP JUNCTION (SOUTH LINES)—ORE

9.5	25B	8		Piling	132 lin. ft. @	$0.40	Piling	132 lin. ft. @	$0.40	Total as per Exhibit 1	53	50	26	53			158		79
				Timber	1.70 M.B.M.	43.64	Timber	1.90 M.B.M.	43.00		74	50	37	82					
				Wrought iron	285 lbs															
				Cast iron	54 lbs															
				Total iron	339 lbs	0.035	Iron	348 lbs	0.035		12	50	6	12						
				Bridge ties (0.43 M.B.M.)	9	2.0875	Bridge ties	0.40 M.B.M.	34.00		19	50	10	14						
											158		79	161	50	81	158		79	

HUMBOLDT TO REPUBLIC

4.2	5C	8	4	Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Total as per Exhibit 1	53	52	28	53			158		85	
				Timber	1.70 M.B.M.	43.64	Timber	1.89 M.B.M.	43.00		74	50	37	81						
				Wrought iron	285 lbs															
				Cast iron	54 lbs															
				Total iron	339 lbs	0.035	Iron	348 lbs	0.035		12	76	10	12						
				Bridge ties (0.43 M.B.M.)	9	2.0875	Bridge ties	0.40 M.B.M.	34.00		19	50	10	14						
											158		85	160	50	80	158		85	
4.5	7C	13	8	Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Total as per Exhibit 1	53	52	28	53			214		112	
				Lumber	2.7 M.B.M.	43.64	Timber	2.29 M.B.M.	43.00		118	50	59	98						
				Wrought iron	354 lbs															
				Cast iron	54 lbs															
				Total iron	408 lbs	0.035	Iron	360 lbs	0.035		14	76	11	13						
				Bridge ties (0.67 M.B.M.)	14	2.0875	Bridge ties	0.65 M.B.M.	34.00		29	50	14	22						
											214		112	186	50	91	214		112	

Mile Post	Bridge No.	Lgth. Ft.	No. Bents	Riggs—1911—Exhibit 1			Hansel—1913—Exhibit 15			Riggs—1913—Exhibit 1-A	1911 C. R.	%	1911 P. V.	1912 C. R.	%	1912 P. V.	1913 C. R.	%	1913 P. V.
											$		$	$		$	$		$
7.4	16C	8	4	Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Total as per Exhibit 1	53	50	26	53			158		79
				Timber	1.70 M.B.M.	43.64	Timber	1.89 M.B.M.	43.00		74	50	37	81					
				Wrought iron	285 lbs														
				Cast iron	54 lbs														
				Total iron	339 lbs	0.035	Iron	348 lbs	0.035		12	50	6	12					
				Bridge iron (0.43 M.B.M.)	9	2.0875	Bridge ties	0.65 M.B.M.	34.00		19	50	10	22					
											158		79	168	50	84	158		79
				Total Marquette to Nestoria							2,015		1,025	1,778		890	1,173		600
NESTORIA TO HOUGHTON																			
27.6	55D	8	3½	Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Filled	53	50	26	53					
				Timber	1.70 M.B.M.	43.64	Timber	1.88 M.B.M.	43.00		74	50	37	81					
				Wrought iron	285 lbs														
				Cast iron	54 lbs														
				Total Iron	339 lbs	0.035	Iron	348 lbs	0.035		12	60	7	12					
				Bridge Ties (0.43 M.B.M.)	9	2.0875	Bridge Iron	0.40 M.B.M.	34.00		19	50	10	14					
											158		80	160	50	80			
	57D	10		Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Replaced	53	50	26	53					
				Timber	1.83 M.B.M.	43.64	Timber	2.06 M.B.M.	43.00		80	50	40	89					
				Wrought iron	291 lbs														

			Cast iron	54 lbs																
			Total iron	345 lbs	0.035	Iron	352 lbs	0.035		12	60	7	12							
			Bridge ties (0.53 M.B.M.)	11	2.0675	Bridge ties	0.50 M.B.M.	34.00		23		50	12		17					
										168		85	171	50	86					
33.1	64D	14½	Piling	132 lin. ft.	0.40	Piling	132 lin. ft.	0.40	Total as per Exhibit 1	53	50	26	53				215		109	
			Timber	2.65 M.B.M.	43.64	Timber	2.42 M.B.M.	43.00		116	50	58	104							
			Wrought iron	308 lbs																
			Cast iron	68 lbs																
			Total iron	376 lbs	0.035	Iron	360 lbs	0.035		13	74	9	13							
			Bridge ties (0.77 M.B.M.)	16	2.0675	Bridge ties	0.73 M.B.M.	34.00		33	50	16	25							
										215		109	195	50	98		215		109	
			Total Nestoria to Houghton							541		274	526		264		215		109	
			Total Marquette to Nestoria							2,015		1,025	1,778		890		1,173		600	
			Total Marquette to Houghton							2,556		1,299	2,304		1,154		1,388		709	

NESTORIA TO STATE LINE:

There are no "Open Culverts" on this division.

Schedule No. 5

RECAPITULATION

BRIDGES, TRESTLES and CULVERTS

BRIDGES

	1911			1912			1913		
	No.	C.R.	P.V.	No.	C.R.	P.V.	No.	C.R.	P.V.
		$	$		$	$		$	$
EAST OF MARQUETTE:									
Sault Ste. Marie to Marquette	13	66,864	45,458	14	60,334	39,453	14	65,437	46,334
St. Ignace to Soo Junction	1	2,806	1,766	1	2,431	1,456	1	2,891	1,846
Total East of Marquette	14	69,670	47,224	15	62,765	40,909	15	68,328	48,180
MARQUETTE TO HOUGHTON:									
Marquette to Nestoria	9	36,491	32,657	11	29,475	25,522	10	37,221	33,084
Nestoria to Houghton	7	29,669	18,760	6	25,041	17,150	7	43,020	34,471
Total Marquette to Houghton	16	66,160	51,417	17	54,516	42,672	17	80,241	67,555
NESTORIA TO STATE LINE	10	87,290	51,663	10	73,618	42,558	11	113,176	86,648
Total in Michigan	40	223,120	150,304	42	190,889	125,563	43	261,745	202,383

TRESTLES

	1911			1912			1913		
	No.	C.R.	P.V.	No.	C.R.	P.V.	No.	C.R.	P.V.
		$	$		$	$		$	$
EAST OF MARQUETTE:									
Sault Ste. Marie to Marquette	65	118,259	63,307	65	74,970	36,249	59	37,762	22,811
St. Ignace to Soo Junction	11	7,120	4,008	11	6,442	3,521	11	8,067	4,904
Total East of Marquette	76	125,379	67,315	76	81,412	39,770	70	45,829	27,715
MARQUETTE TO HOUGHTON:									
Marquette to Nestoria	20	17,752	11,652	22	17,096	10,256	19	18,961	12,932
Nestoria to Houghton	48	32,976	18,309	49	35,925	19,418	48	39,086	22,753
Total Marquette to Houghton	68	50,728	29,961	71	53,021	29,674	67	58,047	35,685
NESTORIA TO STATE LINE	34	69,588	41,453	34	55,550	30,572	31	56,100	35,505
Total in Michigan	178	245,695	138,729	181	189,933	100,016	168	159,976	98,905

CULVERTS

	1911			1912			1913		
	No.	C.R.	P.V.	No.	C.R.	P.V.	No.	C.R.	P.V.
		$	$		$	$		$	$
EAST OF MARQUETTE:									
Sault Ste Marie to Marquette	226	40,846	28,886	226	40,834	28,887	201	41,639	31,266
St. Ignace to Soo Junction	72	11,757	6,539	72	11,757	6,539	74	11,204	7,075
Total East of Marquette	298	52,603	35,425	298	52,591	35,426	275	52,834	38,341

OPEN CULVERTS

	1911			1912			1913		
	No.	C.R.	P.V.	No.	C.R.	P.V.	No.	C.R.	P.V.
		$	$		$	$		$	$
EAST OF MARQUETTE:									
Sault Ste Marie to Marquette	15	2,760	1,430	15	2,660	1,333	5	1,021	530
St. Ignace to Soo Junction	6	1,023	522	6	1,038	521	0		
Total East of Marquette	21	3,783	1,952	21	3,698	1,854	5	1,021	530

THIS PAGE VERTICAL

MARQUETTE TO HOUGHTON:																		
Marquette to Nestoria	183	34,086	22,430	183	34,089	22,423	190	37,449	25,720	12	2,015	1,025	11	1,778	890	7	1,173	600
Nestoria to Houghton	168	30,315	19,924	168	30,315	19,924	170	33,022	22,481	3	541	274	3	526	264	1	215	109
Total Marquette to Houghton	351	64,401	42,354	351	64,289	42,347	360	70,471	48,201	15	2,556	1,299	14	2,304	1,154	8	1,388	709
NESTORIA TO STATE LINE	251	55,698	36,419	251	55,698	36,500	253	84,797	66,466									
Total in Michigan	900	172,702	114,198	900	172,578	114,273	888	208,111	153,008	36	6,339	3,251	35	6,002	3,008	13	2,409	1,239

TOTAL BRIDGES, TRESTLES, CULVERTS AND OPEN CULVERTS

	1911			1912			1913		
	No.	C.R.	P.V.	No.	C.R.	P.V.	No.	C.R.	P.V.
		$	$		$	$		$	$
EAST OF MARQUETTE:									
Sault Ste. Marie to Marquette	319	228,729	139,081	320	178,798	105,922	279	145,859	100,941
St. Ignace to Soo Junction	90	22,706	12,835	90	21,668	12,037	86	22,162	13,865
Total East of Marquette	409	251,435	151,916	410	200,466	117,959	365	168,021	114,766
MARQUETTE TO Houghton:									
Marquette to Nestoria	224	90,344	67,764	227	82,438	59,091	226	94,804	72,336
Nestoria to Houghton	226	83,501	57,267	226	91,807	56,756	226	115,343	79,814
Total Marquette to Houghton	450	183,845	125,031	453	174,130	115,847	452	210,147	152,150
NESTORIA TO STATE LINE	295	212,576	129,535	296	184,816	109,630	295	254,073	188,619
Total in Michigan	1,154	647,856	406,482	1,159	559,412	343,436	1,112	632,241	455,535
Deducted by Mr. Riggs in Exhibit 50		12,292	10,690						
Added by Mr. Hansel in Testimony					35,420	23,408			
Modified Totals		635,564	395,792		594,832	366,844			

TIES FOR SIDE TRACKS ARE INCLUDED IN SCHEDULE No. 16

Unit Prices for Ties, 1911—34.77¼c; 1912—40c; 1913—40c

Unit price for 1911 determined as follows:

Total ties for division East of Marquette—645,951		
Cedar, 18% of total	116,271 @ 38¼c=	$ 45,055
Hemlock, 50% of total	331,111 @ 34¼c=	130,531
Tamarack, 23% of total	148,569 @ 33c =	49,028
Including joint track	645,951	$224,614

224,614÷645,951=34.77¼c average price per tie for all divisions.

	Riggs—1911—Exhibit 1						Hansel—1912—Exhibit 15					Riggs—1913—Exhibit 1-A							1911			1912			1913		
	Page in Exhibit 1	Miles	Miles deducted for Bridges	Net Miles	No. Per Mile	Number	Miles	Miles deducted for Bridges	Net Miles	No. Per Mile	Number	Miles	Miles deducted for Bridges	Miles deducted for Turnouts	Net Miles	No. Per Mile	Number	Allocation	C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
EAST OF MARQUETTE																			$		$				$		$
Main Line																											
1st main track																											
S. Ste. Marie to Marquette	144	152.34	1.18	151.16	3,000	453,480	196.88	1.26	195.62	2,960	579,040	152.94	0.99	1.88	149.47	3,000	448,410	F.& P.	157,686	60	94,612	231,616	55	127,389	179,364	60	107,618
Joint 1st main track																											
S. Ste. Marie to Marquette	144	0.83		0.83	3,000	2,490						0.83		0.10	0.73	3,000	2,190	F.& P.	866	60	520				876	60	526
Joint 2nd main track																											
S. Ste. Marie to Marquette	144	0.74		0.74	3,000	2,220						0.74		0.14	0.60	3,000	1,800	F.& P.	772	60	463				720	60	432
1st main track																											
St. Ignace to Soo Junction	144	42.97	0.14	42.83	3,000	128,490						42.97	0.12	0.97	41.88	3,000	125,640	F.& P.	44,679	60	26,807				50,256	60	30,154
Total Main Line		196.88	1.32	195.56		586,680	196.88	1.26	195.62		579,040	196.88	1.11	3.09	192.68		578,040		204,003		122,402	231,616		127,389	231,216		138,730
Branches																											
S. Ste. Marie to Marquette	144	15.40		15.40	2,700	41,580	23.93	0.79	23.14	2,730	63,170	22.83		0.32	22.51	2,700	60,777	F.	14,458	60	8,675	25,268	55	13,897	24,311	60	14,587

THIS PAGE

S. S.te Marie to Marquette Joint	144	0.43		0.43	2,700	1,161					0.43		0.03	0.40	2,700	1,080	F.	404	60	242			4,234	60	2,54
St. Ignace to Soo Junction	144	4.06		4.06	2,700	10,962					4.01		0.09	3.92	2,700	10,584	F.	381	60	2287					
Total Branches		19.89		19.89		53,703	23.93	0.79	23.14	63,170	27.27		0.44	26.83		72,441		18,674		11,204	25,268	13,597	28,977		17,38
Total Main Line		196.88	1.32	195.56		586,680	196.88	1.26	195.62	579,040	196.88	1.11	3.09	192.68		578,040		204,003		122,402	231,616	127,389	231,216		138,73
Total E. of Marquette		216.77	1.32	215.45		640,383	220.81	2.05	218.76	642,210	224.15	1.11	3.53	219.51		650,481		222,677		133,606	256,884	141,286	260,193		156,11
MARQUETTE TO HOUGHTON																										
Main Line																										
1st main track																										
Marquette to Nestoria North line	145	46.90	0.11	46.79	3,000	140,370	126.25	0.90	125.35	2,960	371,040	46.90	0.18	2.25	44.47	3,000	133,410	F.& P.	48,810	60	29,286	148,416	55	81,629	53,364	60	32,01
2nd main track																										
Marquette to Nestoria	145	5.08		5.08	3,000	15,240						5.08	0.02		5.06	3,000	15,180	F.& P.	5,299	60	3,179				6,072	60	3,643
Main track																										
Marquette to Eagle Mills South line	145	17.33	0.17	17.16	3,000	51,480						8.50	0.10		8.40	3,000	25,200	F.& P.	17,901	60	10,741				10,080	60	6,04
Main track																										
Eagle Mills to Winthrop Jct., South line	145											8.83	0.03	0.54	8.26	3,000	24,780	Ore							5,947	60	9,91
Main track																										
Humboldt to Republic (Branch)	145	8.70	0.01	8.69	3,000	26,070						8.70	0.01		8.69	3,000	26,070	F.& P.	9,065	60	5,439				10,428	60	6,25
Main track																										
Nestoria to Houghton	145	48.24	0.72	47.52	3,000	142,560						48.24	0.56	1.07	46.61	3,000	139,830	F.& P.	49,572	60	29,743				55,932	60	33,55
Total Main Line		126.25	1.01	125.24		375,720	126.25	0.90	125.35	371,040	126.25	0.90	3.86	121.49		364,470		130,647		78,388	148,416	81,629	145,788		87,47
Branches																										
Marquette to Nestoria	145	22.83		22.83	2,700	61,641	24.06		24.06	2,730	65,680	4.46		0.43	4.03	2,700	10,881	F.	21,434	60	12,861	26,272	55	14,450	4,352	60	2,61
Marquette to Nestoria												16.05		0.29	15.76	2,700	42,552	Ore							17,021	60	10,21
Joint branches	145	1.59		1.59	2,700	4,293						1.37		0.37	1.00	2,700	2,700	Ore	1,492	60	895				1,080	60	64
Marquette to Houghton	145											1.90			1.90	2,700	5,130	F.							2,052	60	1,23
Total Branches		24.42		24.42		65,934	24.06		24.06		65,680	23.78		1.09	22.69		61,263		22,926		13,756	26,272		14,450	24,505		14,70
Total Main Line		126.25	1.01	125.24		375,720	126.25	0.90	125.35		371,040	126.25	0.90	3.86	121.49		364,470		130,647		78,388	148,416		81,629	145,788		87,47
Total Marquette to Houghton		150.67	1.01	149.66		441,654	150.31	0.90	149.41		436,720	150.03	0.90	4.95	144.18		425,733		153,573		92,144	174,688		96,079	170,293		102,17

BOUND
PAGE CUT OFF

	Riggs—1911—Exhibit 1						Hansel—1912—Exhibit 15					Riggs—1913—Exhibit 1-A						1911			1912			1913		
	Page in Exhibit 1	Miles	Miles deducted for Bridges	Net Miles	No. Per Mile	Number	Miles	Miles deducted for Bridges	Net Miles	No. Per Mile	Number	Miles	Miles deducted for Bridges	Miles deducted for Turnouts	Net Miles	No. Per Mile	Number	Allocation	C. R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
																				$	$		$		$	
NESTORIA TO STATE LINE																										
Main Line																										
1st main track																										
Nestoria to State Line	146	101.47	1.58	99.89	3,000	299,670	103.70	1.56	102.14	2,960	302,330	101.47	1.14	1.88	98.45	3,000	295,350	F.& P.	104,203	60	62,522	120,932	55	66,513	118,140	60	70,884
Bessemer Branch	146	2.23		2.23	3,000	6,690						Included under Branches							2,326	60	1,395						
Total Main Line		103.70	1.58	102.12		306,360	103.70	1.56	102.14		302,330	101.47	1.14	1.88	98.45		295,350		106,529		63,917	120,932		66,513	118,140		70,884
Branches																										
Nestoria to State Line	146	10.56	0	10.56	2,700	28,512	19.23	0.00	19.23	2,730	52,500	21.46	0.16	0.39	20.91	2,700	56,457	F.	9,914	60	5,949	21,000	55	11,550	22,583	60	13,550
Total Branches		10.56		10.56		28,512	19.23	0.00	19.23		52,500	21.46	0.16	0.39	20.91		56,457		9,914		5,949	21,000		11,550	22,583		13,550
Total Main Line		103.70	1.58	102.12		306,360	103.70	1.56	102.14		302,330	101.47	1.14	1.88	98.45		295,350		106,529		63,917	120,932		66,513	118,140		70,884
Total Nestoria to State Line		114.26	1.58	112.68		334,872	122.93	1.56	121.37		354,830	122.93	1.30	2.27	119.36		351,807		116,443		69,866	141,932		78,063	140,723		84,434
RECAPITULATION																										
East of Marquette		216.77	1.32	215.45		640,383	220.81	2.05	218.76		642,210	224.15	1.11	3.53	219.51		650,481		222,677		133,606	256,884		141,286	260,193		156,116
Marquette to Houghton		150.67	1.01	149.66		441,654	150.31	0.90	149.41		436,720	150.03	0.90	4.95	144.18		425,733		153,573		92,144	174,688		96,079	170,293		102,175
Nestoria to State Line		114.26	1.58	112.68		334,872	122.93	1.56	121.37		354,830	122.93	1.30	2.27	119.36		351,807		116,443		69,886	141,932		78,063	140,723		84,434
Total in Michigan		481.70	3.91	477.79		1416909	494.05	4.51	489.54		1433760	497.11	3.31	10.75	483.05		1428021		492,693		295,616	573,504		315,428	571,209		342,725
Deducted by Mr. Riggs in Exhibit 50																			26,293		15,776						
																			466,400		279,840	573,504		315,428	571,209		342,725

THIS PAGE VERTICAL

Total in Michigan	Miles	Deduction for Branches	Deduction for Turnouts	Net Miles	Number	C. R.	P. V.
Riggs, 1911	481.70	3.91		477.79	1,416,909	$466,400	$279,840
Hansel, 1912	494.05	4.51		489.54	1,433,760	573,504	315,428
Riggs, 1913	497.11	3.31	10.75	483.05	1,428,021	571,209	342,725

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS

Schedule No. 7
RAIL

Riggs—1911—Exhibit 1				Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A				1911			1912				1913				
	Rail Wt.	Miles	Gross Tons	Rail Wt.		Gross Tons	Rail Wt.		Gross Tons	Allocated	C.R.	%	P.V.	Per Gross Ton	C.R.	%	P.V.	Per Gross Ton	C.R.	%	P.V.
											$		$	$	$		$	$	$		$
This schedule, in all exhibits, does not include rail in side tracks The unit cost of reproduction in the 1911 and 1913 appraisals, is $31.05 per gross tons.				Note: The weights given correspond to the weights of the rails new. The reduction in weight due to wear, etc., is considered in determining the price per ton.																		
EAST OF MARQUETTE:																						
Main Line																						
S. Ste. Marie to Marquette Joint	80	0.11	13.8296								429	90	400									
S. Ste. Marie to Marquette	80	27.10	3,406.8568	80	New	3,532	80	35.34	4,442.74	F.& P.	105,783	90	98,611	30.30	107,020	95	29.53	104,300	31.05	137,947	95	30.00	133,282
S. Ste. Marie to Marquette	72	1.50	169.7142	72	New	170	72	1.50	169.71	F.& P.	5,270	60	3,841	30.30	5,151	65	25.06	4,260	31.05	5,269	65	23.68	4,019
S. Ste. Marie to Marquette	70	35.20	3,872.000	70	New	7,706	70	34.76	3,823.60	F.& P.	120,226	60	87,624	30.30	233,492	65	25.06	193,112	31.05	118,723	65	23.68	90,543
S. Ste. Marie to Marquette Joint	60	0.72	67.8857				60	0.83	78.26	F.& P.	2,108	60	1,536						31.05	2,430	60	22.63	1,771
S. Ste. Marie to Marquette	60	88.54	8,348.0572	60	New	7,891	60	80.74	7,612.63	F.& P.	259,206	60	188,916	30.30	239,097	50	24.36	192,222	31.05	236,372	60	22.63	272,274
S. Ste. Marie to Marquette Joint 2nd track	60	0.74	69.7714				60	0.74	69.77	F.& P.	2,167	60	1,579						31.05	2,166	60	22.63	1,579
St. Ignace to Soo Juuction	70	34.87	3,835.7000	60	Relaying	1,236	70	34.87	3,835.70	F.& P.	119,099	90	111,024	20.70	25,378	20	17.25	22,149	31.05	119,098	90	28.94	111,005

THIS PAGE BO
VERTICAL IN

St. Ignace to Soo Junction	60	7.60	716.5714				60	7.60	716.57	F.& P.	22,250	80	19,233							31.05	22,249	80	26.84	19,233
St. Ignace to Soo Junction	56	0.50	44.0000	56	New	44	56	0.50	44.00	F.& P.	1,366	50	903	30.30	1,333	33⅓	20.70	911		31.05	1,366	50	20.52	903
Total Main Line		196.88	20,544.3863			20,569		196.88	20,792.98		637,904		513,667		611,471			516,954			645,620			534,609
BRANCHES																									
S. Ste. Marie to Marquette	60	1.14	107.4857								3,337	50	2,206												
S. Ste. Marie to Marquette	56	14.26	1,254.8800	56	Relaying	1,170	56	22.83	2,009.04	F.	38,966	50	25,756	20.70	24,219	20	17.25	20,183		31.05	62,381	50	20.52	41,226
S. Ste. Marie to Marquette Joint	56	0.43	37.8400				56	0.43	37.84	F.	1,175	50	777							31.05	1,175	50	20.52	776
St. Ignace to Soo Junction	60	1.50	141.4286	60	Rela yin	1,002	60	1.50	141.43	F.	4,391	50	2,093	20.70	20,741	20	17.25	17,285		31.05	4,391	50	20.52	2,902
St. Ignace to Soo Junction	56	2.56	225.2800				56	2.51	220.88	F.	6,995	50	4,634							31.05	6,858	50	20.52	4,532
Total Branches		19.89	1,766.9143			2,172		27.27	2,409.19		54,864		36,266		44,960			37,468			74,805			49,436
Total Main Line		196.88	20,544.3863			20,569		196.88	20,792.98		637,904		513,667		611,471			516,954			645,620			534,609
Total East of Marquette		216.77	22,311.3006			22,741		224.15	23,202.17		692,768		549,933		656,431			554,422			720,425			584,045
MARQUETTE TO HOUGHTON																									
Main Line																									
Marquette to Houghton 1st Main Track north line	80	2.95	370.8572	80	New	2,934	80	5.96	749.26	F.& P.	11,515	100	11,515	30.30	88,900	95	29.53	86,641		31.05	23,265	95	30.00	22,478
Marquette to Nestoria	72	7.00	792.0000	72	New	792	72	6.98	789.74	F.& P.	24,592	70	19,590	30.30	23,998	65	25.06	19,848		31.05	24,521	70	24.74	19,538
				72	Relaying	45								20.70	932	20	17.25	776							
Marquette to Nestoria	70	34.35	3,778.5000	70	New	3,905	70	32.06	3,526.60	F.& P.	117,322	70	93,461	30.30	118,322	65	25.06	97,859		31.05	109,501	70	24.74	87,248
Marquette to Nestoria	60	2.60	245.1428	60	New	2,668	60	1.90	179.14	F. &P.	7,612	70	6,063	30.30	80,840	50	22.96	61,257		31.05	5,563	70	24.74	4,432
Marquette to Winthrop Jc.	60	13.10	1,235.1428				60	6.40	603.43	F.& P.	38,351	70	30,551							31.05	18,737	70	24.74	14,929
							70	2.10	231.00	F.& P.										31.05	7,173	70	24.74	5,715
Marquette to Winthrop Jc.							60	4.60	433.71	Ore										31.05	13,467	60	22.63	9,815
Eagle Mills to Winthop Junction, (South line)	56	4.23	372.2400	56	New	631	56	4.23	372.24	Ore	11,558	60	8,424	30.30	19,119	33⅓	20.70	13,062		31.05	11,558	60	22.63	8,424
Humboldt to Republic	60	6.00	565.7142				60	6.00	565.71	F.& P.	17,565	50	11,611							31.05	17,565	50	20.52	11,680
Humboldt to Republic	56	2.70	237.6000				56	2.70	237.60	F.& P.	7,377	50	4,877							31.05	7,377	50	20.52	4,876
Nestoria to Houghton	80	3.98	500.3428				80	15.55	1,954.86	F.& P.	15,536	100	15,536							31.05	60,698	95	30.00	58,646
Nestoria to Houghton	70	3.10	341.0000	70	Relaying	229	70	2.90	319.00	F.& P.	10,588	90	9,870	20.70	4,740	20	17.25	3,950		31.05	9,905	90	28.94	9,232
Nestoria to Houghton	60	40.86	3,852.5142	60	Relaying	2,112	60	29.49	2,780.49	F.& P.	119,621	70	95,292	20.70	43,718	20	17.25	36,432		31.05	86,334	70	24.74	68,789
Nestoria to Houghton	56	0.30	26.4000				56	0.30	26.40	F.& P.	820	50	542							31.05	820	50	20.52	542

	Riggs—1911—Exhibit 1			Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A				1911			1912					1913				
	Rail Wt.	Miles	Gross Tons	Rail Wt.	Miles	Gross Tons	Rail Wt.	Miles	Gross Tons	Allocated	C.R.	%	P.V.	Per Gross Ton	C.R.	%	Per Gross Ton	P.V.	Per Gross Ton	C.R.	%	Per Gross Ton	P.V.
											$		$	$	$		$	$	$	$		$	$
Second main track																							
Marquette to Nestoria	80	3.75	471.4286				80	3.75	471.43	F.& P.	14,638	100	14,638						31.05	14,638	95	30.00	14,143
Second main track																							
Marquette to Nestoria	60	1.33	125.4000				60	1.33	125.40	F.& P.	3,894	100	3,894						31.05	3,894	70	24.74	3,102
Total Main Line		126.25	12,914.2826			13,316		126.25	13,366.01		400,989		325,864		380,569			319,825		415,015			343,517
Branches																							
Marquette to Nestoria	60	0.62	58.4571	60	Relaying	743					1,815	50	1,200	20.70	15,380	20	17.25	12,817					
Marquette to Nestoria	56	4.66	410.0800	56	Relaying	1,424	56	4.46	392.48	F.	12,733	50	8,417	20.70	29,477	20	17.25	24,564	31.05	12,187	50	20.52	8,054
Marquette to Nestoria	60	6.11	576.0857				60	6.73	634.54	O.	17,887	50	11,824						31.05	19,702	50	20.52	13,021
Marquette to Nestoria	56	9.44	830.7200				56	9.32	820.16	O.	25,794	50	17,052						31.05	25,466	50	20.52	16,830
Marquette to Houghton	56	2.00	176.0000				56	1.90	167.20	F.	5,465	50	3,613						31.05	5,192	50	20.52	3,431
Marquette to Nestoria Joint	60	0.72	67.8857				56	0.59	51.92	O.	2,108	50	1,393						31.05	1,612	50	20.52	1,065
Marquette to Nestoria Joint	56	0.87	76.5600				56	0.78	68.64	O.	2,377	50	1,571						31.05	2,131	50	20.52	1,408
Total Branches		24.42	2,195.7885		21.67			23.78	2,124.94		68,179		45,070		44,857			37,381		66,290			43,809
Total Main Line		126.25	12,914.2826			13,316		126.25	13,366.01		400,989		325,864		380,569			319,825		415,015			343,517
Total Marquette to Houghton		150.67	15,110.0711			15,483		150.03	15,500.95		469,168		370,934		425,426			357,206		481,305			387,326
NESTORIA TO STATE LINE: Main Line																							
Nestoria to State Line	80	5.18	651.2000	80	New	855	80	6.80	854.86	F.& P.	20,220	90	18,849	30.30	25,907	95	29.53	25,248	31.05	26,543	95	30.00	25,646
Nestoria to State Line	70	3.14	345.4000	70	New	330	70	3.00	330.00	F.& P.	10,725	80	9,271	30.30	9,999	65	25.06	8,270	31.05	10,246	80	26.84	8,857
Nestoria to State Line	60	93.15	8,782.7144	60	New	8,629	60	91.67	8,643.17	F.& P.	272,704	50	180,265	30.30	261,459	33⅓	20.70	178,620	31.05	268,370	50	20.52	177,358
				60	Relaying	20								20.70	414	20	17.25	345					

Remmer Branch																								
Total Main Line	56	103.70	9,975.5544	56	New	10,028	56	103.70	10,024.27	F.	309,742	50	212,413	30.30	303,657	20.70	216,499	31.05	311,252	50	20.52	215,888
Branches																								
Nestoria to State Line	56	10.56	929.2800	60	Relaying	832	56	19.23	1,692.24	F.	28,855	50	19,073	20.70	17,222	20	17.25	14,352	31.05	52,544	50	20.52	34,725
				56	Relaying	916								20.70	18,961	20	17.25	15,801						
Total Branches		10.56	929.2800			1,748		19.23	1,692.24		28,855		19,073		36,183			30,153		52,544			34,725
Total Main Line		103.70	9,975.5544			10,028		103.70	10,024.27		309,742		212,413		303,657			216,499		311,252			215,888
Total Nestoria to State line		114.26	10,904.8344			11,776		122.93	11,716.51		338,597		231,486		339,840			246,652		363,796			250,613
TOTALS BY DIVISIONS																								
East of Marquette		216.77	22,311.3000			22,741		224.15	23,202.17		692,768		549,933		656,431			554,422		720,425			584,045
Marquette to Houghton		150.67	15,110.0711			15,483		150.03	15,500.95		469,168		370,934		425,426			357,206		481,305			387,326
Nestoria to State Line		114.26	10,904.8344			11,776		122.93	11,716.51		338,597		231,486		339,840			246,652		363,796			250,613
Total in Michigan		481.70	48,326.2061			50,000		497.11	50,419.63		1,500,533		1,152,353		1,421,697			1,158,280		1,565,526			1,221,984

RECAPITULATION

SCHEDULE No. 7

	Weight Per Yard, Lbs.	Riggs—1911		Hansel—1912		Riggs—1913		1911				1912				1913			
		Gross Tons	Total	Gross Tons	Total	Gross Tons	Total	C. R.	P. V.	Total C. R.	Total P. V.	C. R.	P. V.	Total C. R.	Total P. V.	C. R.	P. V.	Total C. R.	Total P. V
								$	$	$	$	$	$	$	$	$	$	$	$
MAIN LINE																			
East of Marquette	80	3,420.6864		3,532		4,442.74		106,212	99,011			107,020	104,300			137,947	133,282		
Marquette to Houghton	80	1,342.6286		2,934		3,175.55		41,689	41,689			88,900	86,641			98,601	95,267		
Nestoria to State Line	80	651.2000	5,414.5150	855	7,321	854.86	8,473.15	20,220	18,849	168,121	159,549	25,907	25,248	221,827	216,989	26,543	25,646	263,091	254,1
East of Marquette	72	169.7142		170		169.71		5,270	3,841			5,151	4,260			5,269	4,019		
Marquette to Houghton	72	792.0000		837		789.74		24,592	19,590			24,930	20,624			24,521	19,538		
Nestoria to State Line			961.7142		1,007		959.45			29,862	23,431			30,081	24,884			29,790	23,5
(None)																			
East of Marquette	70	7,707.7000		7,706		7,659.30		239,325	198,648			233,492	193,112			237,821	201,548		
Marquette to Houghton	70	4,119.5000		4,134		4,076.60		127,910	103,331			123,062	101,809			126,579	102,195		
Nestoria to State Line	70	345.4000	12,172.6000	330	12,170	330.00	12,065.90	10,725	9,271	377,960	311,250	9,999	8,270	466,553	303,191	10,246	8,857	374,646	312,6
East of Marquette	60	9,202.2857		9,117		8,477.23		285,731	211,264			264,479	214,371			263,217	194,857		
Marquette to Houghton	60	6,023.9140		4,780		4,687.88		187,043	147,411			124,558	97,689			145,559	112,675		
Nestoria to State Line	60	8,782.7144	24,008.9141	8,649	22,546	8,643.17	21,808.28	272,704	180,265	745,478	538,940	261,873	178,965	650,906	491,025	268,370	177,358	677,146	484,8
East of Marquette	56	44.0000		44		44.00		1,366	903			1,333	911			1,366	903		
Marquette to Houghton	56	636.2400		631		636.24		19,755	13,843			19,119	13,062			19,755	13,842		
Nestoria to State Line	56	196.2400	876.4800	194	869	196.24	876.48	6,093	4,028	27,214	18,774	5,878	4,016	26,330	17,989	6,093	4,027	27,214	18,7
Total Main Line			43,434.2233		43,913		44,183.26			1,348,635	1,051,944			1,395,697	1,053,278			1,371,887	1,094,0
BRANCHES																			
East of Marquette	60	248.9143		1,002		141.43		7,728	5,109			20,741	17,285			4,391	2,902		
Marquette to Houghton	60	702.4285		743		634.54		21,810	14,417			15,380	12,817			19,702	13,021		
Nestoria to State Line	60		951.3428	832	2,577		775.97			29,538	19,526	17,222	14,352	53,343	44,454			24,093	15,9
East of Marquette	56	1,518.0000		1,170		2,267.76		47,136	31,157			24,219	20,183			70,414	46,534		

Marquette to Houghton	56	1,493.3600		1,424		1,500.40		46,369	30,653			29,477	24,564			46,588	30,788		
Nestoria to State Line	56	929.2800	3,940.6400	916	3,510	1,692.24	5,460.40	28,855	19,073	122,360	80,883	18,961	15,801	72,657	60,548	52,544	34,725	169,546	112,047
Total Branches			4,891.9828		6,087		6,236.37			151,898	100,409			126,000	105,002			193,639	127,970
Total Main Line		43,434.2233		43,913			44,183.26			1,348,635	1,051,944			1,395,697	1,053,278			1,371,887	1,094,014
Total in Michigan			48,326.2061		50,000		50,419.63			1,500,533	1,152,353			1,421,697	1,158,280			1,565,526	1,221,984
Added by Mr. Riggs in Exhibit 50																			
Transferred from terminals										27	25								
Total										1,500,560	1,152,378			1,421,697	1,158,280			1,565,526	1,221,984

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS

Schedule No. 8
TRACK FASTENINGS

	Riggs—1911—Exhibit				Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A				1911			1912			1913		
	Page in Exhibit 1	Miles	Quantity	Unit Price	Miles	Quantity	Unit Price	Miles	Quantity	Alloc.	Unit Price	C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
Note: This schedule in all exhibits, does	not	include	track fastenings	for side tracks.							$	$		$	$		$	$		$
EAST OF MARQUETTE:				$			$													
Main Line																				
Angle Bars																				
1st main line																				
S. S. Marie to Marquette	151	128.84	1,009.3180 tons	34.00				152.34	945.91 tons	F.& P.	34.00	34,316	60	25,457				32,161	75	26,485
Joint 1st main track																				
S. S. Marie to Marquette	151	0.72	3.6000	34.00				.83	4.37	F.& P.	34.00	122	60	88				149	60	107
Joint 2nd main track																				
S. S. Marie to Marquette	151	0.74	3.7000	34.00				.74	3.90	F.& P.	34.00	126	60	90				133	60	95
1st main track																				
St Ignace to Soo Junction	152	42.97	530.7722	34.00				42.97	403.38	F.& P.	34.00	18,046		16,658				13,715	90	12,747
Total main line angle bars east of Marquette		173.27	1,547.3902 tons			1,386 tons	34.00	196.88	1,357.56 tons	F.& P.		52,610		42,293	47,124	85	40,055	46,158		39,434
Continuous Joints																				
1st main line																				
Sault Ste. Marie to Marquette	151	23.50	8,352 jts.	1.80				Mileage included in Angle Bars	7,987. jts.	F.& P.	1.80	15,033	90	13,750				14,377	95	13,766
Joint 1st main line																				
Sault Ste. Marie to Marquette	151	.11	39. jts.	1.80								70	90	64						
Total main line continuous joints east of Marquette		23.61	8,391 jts.			12,416	1.70		7,987			15,103		13,820	21,107	85	17,941	14,377		13,766

Bolts																				
1st main line																				
Sault Ste. Marie to Marquette	151	152.34	124.7631 tons	52.00				152.34	113.57 tons	F.& P.	52.00	6,488		4,381			5,906	75	4,430
Joint 1st main line																				
Sault Ste. Marie to Marquette	151	.83	0.5054	52.00				.83	.44	F.& P.	52.00	26		17			23	60	14
Joint 2nd main line																				
Sault Ste. Marie to Marquette	151	.74	0.4218	52.00				.74	.38	F.& P.	52.00	22		13			20	60	12
1st main line																				
St. Ignace to Soo Junction	152	42.97	51.2418	52.00				42.97	45.39	F.& P.	52.00	2,665		2,370			2,360	90	2,124
Total bolts main line east of Marquette		196.85	176.9321 tons		196.88	141.9 tons	48.00	196.88	159.78 tons	F.& P.		9,201		6,781	6,811	85	5,789	8,309		6,580
Nut Locks																				
1st main line																				
Sault Ste. Marie to Marquette	157	152.34	255.931	5.20				152.34	245.115 M	F.& P.	5.20	1,331	50	665			1,275	75	956
Joint main line																				
Sault Ste. Marie to Marquette	157	.83	1.395	5.20				.83	1.213	F.& P.	5.20	7	50	3			6	60	4
Joint 2nd main line																				
Sault Ste. Marie to Marquette	157	.74	1.243	5.20				.74	1.081	F.& P.	5.20	6	50	3			6	60	4
1st main line																				
St. Ignace to Soo Junction	157	42.97	72.190	5.20				42.97	79.328	F.& P.	5.20	375	50	188			413	90	372
Total nut locks, main line east of Marquette		196.88	330.759		196.88	263,700	5.20 per M	196.88	326.737 M	F.& P.		1,719		859	1,371	75	1,028	1,700		1,336
Rail Braces																				
1st main line																				
Sault Ste. Marie to Marquette	157	152.34	1,241.	0.115				152.34	1,500.	F.& P.	0.115	143	95	136			172	95	163
Joint main line																				
Sault Ste. Marie to Marquette	157	.83	7.	0.115				.83	200.	F.& P.	0.115	1		1			239	5	22
Joint 2nd main line																				
Sault Ste. Marie to Marquette	157	.74	5.	0.115				.74	200.	F.& P.	0.115	1		1			23	95	22
1st main line																				
St. Ignace to Soo Junction	157	42.97	350.	0.115				42.97	1,000.	F.& P.	0.115	40	95	38			115	95	109
Total rail braces, main line east of Marquette		196.88	1,603.		196.88	1,760	0.115	196.88	2,900.	F.& P.		185		176	202	75	152	333		316

	Riggs—1911—Exhibit 1				Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A				1911			1912			1913		
	Page in Exhibit 1	Miles	Quantity	Unit Price	Miles	Quantity	Unit Price	Miles	Quantity	Unit Price	Alloc.	C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				$			$			$		$		$	$		$	$		$
Spikes																				
1st main line																				
Sault Ste. Marie to Marquette	157	152.34	9,74[illegible].6 cwt.	2.10				152.34	9,749.76 cwt.	2.10	F.& P.	20,474	75	15,335				20,474	65	13,308
Joint main line																				
Sault Ste. Marie to Marquette	157	.83	53.12	2.10				.83	53.12	2.10	F.& P.	112	75	84				112	65	73
Joint 2nd main line																				
Saule Ste. Marie to Marquette	157	.74	47.36	2.10				.74	47.36	2.10	F.& P.	99	75	74				99	65	64
1st main line																				
St. Ignace to Soo Junction	157	42.97	2,750.08	2.10				42.97	2,750.08	2.10	F.& P.	5,775	75	4,331				5,775	65	3,754
Total spikes, main line east of Marquette		196.88	12,600.32 cwt.		196.88	12,461.cwt.	1.90	196.88	12,600.32 cwt.		F.& P.	26,460		19,844	23,676	75	17,757	26,460		17,199
Branches																				
Angle Bars																				
Branches, S. S. Marie to Marquette	151	15.40	77.0000 tons	34.00				22.83	109.36 tons	34.00	F.	2,618	50	1,694				3,718	50	2,406
Joint branches																				
Sault Ste. Marie to Marquette	152	.43	2.1500	34.00				0.43	2.06	34.00	F.	73	50	48				70	50	45
Branches, St. Ignace to Soo Junction	153	4.06	20.3000	34.00				4.01	19.92	34.00	F.	690	50	447				677	50	438
Total Angle Bars, Branches east of Marquette		19.89	99.4500 tons		23.93	133.85 ts	34.00	27.27	131.34 tons		F.	3,381		2,189	4,551	75	3,413	4,465		2,889
Bolts																				
Branches, S. S. Marie to Marquette	151	15.40	8.7780 tons	52.00				22.83	11.87 tons	52.00	F.	457	50	228				617	50	308
Joint branches																				
Sault Ste. Marie to Marquette	152	.43	0.2451	52.00				0.43	0.23	52.00	F.	13	50	6				12	50	6
Branches, St. Ignace to Soo Junction	152	4.06	2.3140	52.00				4.01	2.08	52.00	F.	120	50	60				108	50	54

Total Bolts, Branches East of Marquette		19.89	11.3371 tons		23.93	13.83	48.00	27.27	14.18 tons		F.	590		294	664	75	498	737		368
Branches																				
Nut Locks																				
Branches, S. S. Marie to Marquette	157	15.40	4.390 M	5.20				22.83	33.355 M	5.20	F.	23	50	11				173	50	86
Joint Branches																				
Sault Ste. Marie to Marquette	157	.43	.123	5.20				.43	0.628	5.20	F.	1		1				3	50	2
Branches, St. Ignace to Soo Junction	157	4.06	1.156	5.20				4.01	5.859	5.20	F.	6	50	3				30	50	15
Total Nut Locks, Branches East of Marquette		19.89	5.669		23.93	7,500.	5.20 per M	27.27	39.842		F.	30		15	39	75	29	206		103
Rail Braces																				
Branches, S. S. Marie to Marquette	157	15.40	126.	0.115				22.83	500.	0.115	F.	14	95	13				58	95	55
Joint branches																				
Sault Ste. Marie to Marquette	157	.43	4.	0.115				.43	100.	0.115	F.	1		1				12	95	11
Branches, St. Ignace to Soo Junction	157	4.06	33.	0.115				4.01	400.	0.115	F.	4		4				46	95	44
Total Rail Braces, Branches East of Marquette		19.89	163.			220.	0.115	27.27	1,000.		F.	19		18	25	75	19	116		110
Spikes																				
Branches, S. S. Marie to Marquette	157	15.40	893.20 cwt.	2.10				22.83	1,324.14 cwt.	2.10	F.	1,876	75	1,407				2,781	65	1,808
Joint branches																				
Sault Ste. Marie to Marquette	157	.43	24.94	2.10				.43	24.94	2.10	F.	52	75	39				52	65	34
Branches, St. Ignace to Soo Junction	157	4.06	235.48	2.10				4.01	232.58	2.10	F.	495	75	371				488	65	317
Total Spikes, Branches East of Marquette		19.89	1,153.62 cwt.		23.93	1,395. cwt.	1.90	27.27	1,581.66 cwt.		F.	2,423		1,817	2,651	75	1,988	3,321		2,159
MARQUETTE TO HOUGHTON:																				
Main Line																				
Angle Bars																				
1st Main Line, Marquette to Nestoria, north Line	153	46.90	635.8600 tons	34.00				46.90	542.69 tons	34.00	F.& P.	21,619		17,339				18,451	75	15,195
1st main line, Marquette to Eagle Mills, south Line								8.50	59.58	34.00	F.& P.	2,946		2,271				2,026	70	1,597
1st main line, Eagle Mills to Winthrop Jct., south line	153	17.33	86.6500	34.00				8.83	44.50	34.00	O.							1,513	60	1,086
2nd main line, Marquette to Nestoria	153	5.08	59.3750	34.00				5.08	51.49	34.00	F.& P.	2,019		2.019				1,751	90	1,627

	Riggs—1911—Exhibit 1				Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A				1911		1912			1913		
	Page in Exhibit 1	Miles	Quantity	Unit Price	Miles	Quantity	Unit Price	Miles	Quantity	Unit Price	Alloc.	C.R.	P.V.	C.R.	P.V.		C.R.	%	P.V.
				$			$				$	$	$	$	$		$		$
1st main line, Nestoria to Houghton	153	48.24	306.1680	34.00				48.24	314.32	34.00	F.& P.	10,410	8,810				10,687	80	9,178
1st main line, Humboldt to Republic (Republic Branch)	153	8.70	43.5000	34.00				8.70	44.55	34.00	F.& P.	1,479	957				1,515	50	990
Total Angle Bars, Marquette to Houghton, main line		126.25	1,131.5530		126.25	1,147.8	34.00	126.25	1,057.13 tons			38,473	31,396	39,025	85	33,171	35,943		29,663
Bolts																			
1st main line, Marquette to Nestoria, north line	153	46.90	60.8440 tons	52.00				46.90	55.77 tons	52.00	F.& P.	3,165	2,278				2,900	75	2,175
1st main line, Marquette to Eagle Mills, south line	153	17.33	9.8781	52.00				8.50	8.01	52.00	F.& P.	513	347				417	70	292
1st main line, Eagle Mills to Winthrop Junction, south line								8.83	7.42	52.00	O.						386	60	232
2nd main line, Marquette to Nestoria	153	5.08	5.7831	52.00				5.08	5.81	52.00	F.& P.	300	300				302	90	272
1st main line Nestoria to Houghton	153	48.24	32.9484	52.00				48.24	45.47	52.00	F.& P.	1,713	1,323				2,364	80	1,891
1st main line, Humboldt to Republic (Republic branch)	153	8.70	4.9590	52.00				8.70	7.15	52.00	F.& P.	258	128				372	50	186
Total Bolts, Marquette to Houghton, Main Line		126.25	114.4126 tons		126.25	97.4 tons		126.25	129.63 tons			5,949	4,376	4,675	85	3,974	6,741		5,048
Nut Locks																			
1st main line, Marquette to Nestoria, north line								46.90	9.801 M	5.20	F.& P.						510	75	382
1st main line, Marquette to Eagle Mills, south line								8.50	13.951	5.20	F.& P.						73	70	51

1st main line, Eagle Mills to Winthrop Junction, South line									8.83	12.901	5.20	O.								67	60	46
2nd main line, Marquette to Nestoria	157	5.08	8.412	M	5.20				5.08	9.468	5.20	F.& P.	44	50	22					49	90	44
1st main line, Nestoria to Houghton									48.24	73.365	5.20	F.& P.								381	80	305
1st main line, Humboldt to Republic (Republic branch)									8.70	12.711	5.20	F.& P.								66	50	33
1st main line, Marquette to Houghton	157	121.17	200.658		5.20								1,043	50	522							
Total Nut Locks, Marquette to Houghton, Main Line		126.25	209.070			126.25	230,000.	5.20 per M	126.25	220.407			1,087		544	1,196	75	897		1,146		855
Rail Braces																						
1st main line, Marquette to Nestoria, north line									46.90	2,500.	0.115	F.& P.								288	95	274
1st main line, Marquette to Eagle Mills, south line									8.50	4,000.	0.115	F.& P.								460	95	437
1st main line, Eagle Mills to Winthrop Junction, south line									8.83	1,500.	0.115	O.								172	95	163
2nd main line, Marquette to Nestoria	157	5.08	620.		0.115				5.08	200.	0.115	F.& P.	71	95	67					23	95	22
1st main line, Nestoria to Houghton									48.24	3,000.	0.115	F.& P.								345	95	328
1st main line, Humboldt to Republic (Republic branch)									8.70	1,000.	0.115	F.& P.								115	95	109
1st main line, Marquette to Houghton	157	121.17	14,783.		0.115								1,700	95	1,615							
Total Rail Braces, Marquette to Houghton, Main Line		126.25	15,403.			126.25	16,940.	0.115	126.25	12,200.			1,771		1,682	1,948	75	1,461		1,403		1,333
Spikes																						
1st main line, Marquette to Nestoria, north line									46.90	3,001.60 cwt.	2.10	F.& P								6,303	65	4,097
1st main line, Marquette to Eagle Mills, south line									8.50	544.00	2.10	F.& P.								1,142	65	742
1st main line, Eagle Mills to Winthrop Junction, south line									8.83	565.12	2.10	O.								1,187	65	772
2nd main line, Marquette to Nestoria	157	5.08	325.12	cwt.	2.10				5.08	325.12	2.10	F.& P.	683	75	512					683	65	444

	Riggs—1911—Exhibit 1				Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A				1911			1912			1913		
	Page in Exhibit 1	Miles	Quantity	Unit Price	Miles	Quantity	Unit Price	Miles	Quantity	Unit Price	Alloc.	C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				$			$			$		$		$	$		$	$		$
1st main line, Nestoria to Houghton								48.24	3,087.36	2.10	F. &P.							6,483	65	4,214
1st main line, Humboldt to Republic (Republic branch)								8.70	504.60	2.10	F.& P.							1,060	65	689
1st main line, Marquette to Houghton	157	121.17	7,754.88	2.10								16,285	75	12,214						
Total spikes, Marquette to Houghton, Main Line		126.25	8,080.00 cwt.		126.25	8,243. cwt.	1.90	126.25	8,027.80 cwt.			16,968		12,726	15,662	75	11,747	16,858		10,958
Branches																				
Angle Bars																				
Branches, Marquette to Houghton	154	22.83	114.1500 tons	34.00								3,881		2,511						
Joint bracnbes, Marquette to Houghton	155	1.59	7.9500	34.00				1.37	6.56 tons	34.00	O.	270			174			223	50	144
Branches, Marquette to Nestoria								4.46	21.36	34.00	F.							726	50	470
Ore Branches, Marquette to Nestoria								16.05	78.46	34.00	O.							2668	50	1,726
Branches, Nestoria to Houghton								1.90	9.10	34.00	F.							309	50	200
Total Angle Bars, Branches, Marquette to Houghton		24.42	122.1000 tons		24.06	132.6 tons	34.00	23.78	115.48 tons			4,151		2,685	4,508	65	2,930	3,926		2,540
Bolts																				
Branches, Marquette to Houghton	154	22.83	13.031 tons	52.00								677		339						
Joint branches, Marquette to Houghton	155	1.59	.9063	52.00				1.37	0.71 tons	52.00	O.	47		23				37	50	18
Branches, Marquette to Nestoria								4.46	2.32	52.00	F.							121	50	60
Ore Branches, Marquette to Nestoria	*							16.05	8.35	52.00	O.							434	50	217

Branches, Nestoria to Houghton								1.90	0.99	52.00	F.						51	50	99
Total Bolts, Branches, Marquette to Houghton		24.42	13.9194	tons		24.06	13.89. tons	48.00	23.78	12.37			724		362	667	65	434	643		321
Nut Locks																					
Branches, Marquette to Houghton	157	22.83	9.350	M	5.20								49	50	24						
Joint branches, Marquette to Houghton	157	1.59	.652		5.20				1.37	2.002 M	5.20	O.	3	50	2				10	50	5
Branches, Marquette to Nestoria									4.46	6.516	5.20	F.							34	50	17
Ore Branches, Marquette to Nestoria									16.05	23.449	5.20	O.							122	50	61
Branches, Nestoria to Houghton									1.90	2.772	5.20	F.							14	50	7
Total Nut Locks, Branches, Marquette to Houghton		24.42	10.002	M		24.06	12,000.	5.20 per M	23.78	34.739			52		26	62	75	47	180		90
Rail Braces																					
Branches, Marquette to Houghton	157	22.83	2,785.		0.115								320	95	304						
Joint Branches, Marquette to Houghton	157	1.59	194.		0.115				1.37	1,000.	0.115	O.	22	95	20				115	95	109
Branches, Marquette to Nestoria									4.46	500.	0.115	F.							58	95	55
Ore Branches, Marquette to Nestoria									16.05	10,000.	0.115	O.							1,150	95	1,092
Branches, Nestoria to Houghton									1.90	350.	0.115	F.							40	95	38
Total Rail Braces, Branches, Marquette to Houghton		24.42	2,979.	M		24.06	3,560. M	0.115	23.78	11,850			342		324	409	75	307	1,363		1,294
Spikes																					
Branches, Marquette to Houghton	157	22.83	1,324.14	cwt.	2.10								2,781	75	2,086						
Joint Branches, Marquette to Houghton	157	1.59	92.21		2.10				1.37	79.46 cwt.	2.10	Ore	194	75	145				167	65	109
Branches, Marquette to Nestoria									4.46	258.68	2.10	F.							543	65	353
Ore Branches, Marquette to Nestoria									16.05	930.90	2.10	O.							1,955	65	1,271
Branches, Nestoria to Houghton									1.90	110.20	2.10	F.							231	65	150
Total Spikes, Branches, Marquette to Houghton		24.42	1,416.35	cwt.	2.10	24.06	1,455. cwt.	1.90	23.78	1,379.24 cwt.			2,975		2,231	2,765	75	2,074	2,896		1,883

	Riggs—1911—Exhibit 1				Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A				1911			1912			1913		
	Page in Exhibit 1	Miles	Quantity	Unit Price	Miles	Quantity	Unit Price	Miles	Quantity	Unit Price	Alloc.	C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				$			$				$	$		$	$		$	$		$
Nestoria to State Line																				
Main Line																				
Angle Bars																				
1st Main Line								101.47	592.65 tons	34.00	F.& P.							20,150	60	14,461
1st iman line								2.23	10.68	34.00	F.							363	50	235
Total, 1st Main Line, Angle Bars	156	103.70	593.8792 tons	34.00	103.70	675.9 tn.	34.00	103.70	603.33 tons			20,192		14,083	22,981	80	18,385	20,513		14,696
Bolts																				
1st main line								101.47	88.64 tons	52.00	F.& P.							4,609	60	2,765
1st main line								2.23	1.87	52.00	F.							97	50	48
Total 1st Main Line	156	103.70	65.5154 tons	52.00	103.70	64.1 tns	48.00	103.70	90.51 tons			3,407		1,914	3,077	80	2,461	4,706		2,813
Nut Locks																				
1st main line								101.47	153.147 M	5.20	F.& P.							796	60	478
1st main line								2.23	3.258	5.20	F.							17	50	8
Total 1st Main Line Nut Locks	158	103.70	151.395 M	4.75	103.70	166,500.	5.20 per M	103.70	156.405 M			787	50	394	866	75	650	813		486
Rail Braces																				
1st main line								101.47	20,000.	0.115	F.& P.							2,300	95	2,185
1st main line								2.23	1,000.	0.115	F.							115	95	109
Total 1st Main Line Rail Braces	158	103.70	8,690.	0.115	103.70	9,650.	0.115	103.70	21,000.			999	95	949	1,099	75	824	2,415		2,294
Spikes																				
1st main line								101.47	6,494.08 cwt	2.10	F.& P.							13,638	65	8,865
1st main line								2.23	142.72	2.10	F.							300	65	195
Total 1st Main Line Spikes	158	103.70	6,636.80 cwt.	2.10	103.70	6,701. cwt.	1.90	103.70	6,636.80 cwt.			13,937	75	10,453	12,732	75	9,549	13,938		9,060

Branches																						
Angle Bars	156	10.56	52.8000 tons	34.00	19.23	107.7 tons	34.00	19.23	92.11 tons	34.00	F.	1,795		1,162	3,662	75	2,747	3,132	50	2,026
Bolts	156	10.56	6.0192 tons	52.00	19.23	11.11	48.00	19.23	10.00	52.00	F.	313		156	533	75	400	520	50	260
Nut Locks	158	10.56	6.605 M	4.75	19.23	12,700	5.20 per M	19.23	28.095 M	5.20	F.	34	50	17	66	75	50	146	50	73
Rail Braces	158	10.56	875.	0.115	19.23	1,760.	0.115	19.23	2,000.	0.115	F.	101	95	96	202	75	152	230	95	218
Spikes	158	10.56	612.48 cwt.	2.10	19.23	1,150 cwt	1.90	19.23	1,115.34 cwt.	2.10	F.	1,285	75	964	2,185	75	1,639	2,342	65	1,522

Schedule No. 8
TRACK FASTENINGS

RECAPITULATION

	Quantity						1911				1912				1913			
	1911		1912		1913		Main Line		Branches		Main Line		Branches		Main Line		Branches	
	Main Line	Branches	Main Line	Branches	Main Line	Branches	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.	C.R	P.V
							$	$	$	$	$	$	$	$	$	$	$	$
ANGLE BARS	tons	tons	tons	tons	tons	tons												
East of Marquette	1,547.3902	99.4500	1,386.0	133.85	1,357.56	131.34	52,610	42,293	3,381	2,189	47,124	40,055	4,551	3,413	46,158	39,434	4,465	2,889
Marquette to Houghton	1,131.5530	122.1000	1,147.8	132.60	1,057.13	115.48	38,473	31,396	4,151	2,685	39,025	33,171	4,508	2,930	35,943	29,663	3,926	2,540
Nestoria to State Line	593.8792	52.8000	675.9	107.7	603.33	92.11	20,192	14,083	1,795	1,162	22,981	18,385	3,662	2,747	20,513	14,696	3,132	2,026
Totals	3,272.8224	274.3500	3,209.7	374.15	3,018.02	338.93	111275	87,772	9,327	6,036	109130	91,611	12,721	9,090	102,614	83,793	11,523	7,455
Total Main Line Angle Bars in Mich.	3,272.8224		3,209.7		3,018.02		111275	87,772			109130	91,611			102,614	83,793		
Total Branch Line Angle Bars in Mich.	274.3500		374.15		338.93		9,327	6,036			12,721	9,090			11,523	7,455		
Total Angle Bars in Michigan	3,547.1724	tons	3,583.85	tons	3,356.95	tons	120602	93,808			121851	100701			114,137	91248		
CONTINUOUS JOINTS:																		
Total in Michigan	8,391. Jts.		12,416. Jts.		7,987 Jts.		15,103	13,820			21,107	17,941			14,377	13,766		
BOLTS:	tons	tons	tons	tons	tons	tons												
East of Marquette	176.9321	11.3371	141.9	13.83	159.78	14.18	9,201	6,781	590	294	6,811	5,789	664	498	8,309	6,580	737	368
Marquette to Houghton	114.4126	13.9194	97.4	13.89	129.63	12.37	5,949	4,376	724	362	4,675	3,974	667	434	6,741	5,048	643	321
Nestoria to State Line	65.5154	6.0192	64.1	11.11	90.51	10.00	3,407	1,914	313	156	3,077	2,461	533	400	4,706	2,813	520	260
Totals	356.8601	31.2757	303.4	38.83	379.92	36.55	18,557	13,071	1,627	812	14,563	12,224	1,864	1,332	19,756	14,441	1,900	949
Total Main Line Bolts in Michigan	556.8601		303.4		379.92		18,557	13,071			14,563	12,224			19,756	14,441		
Total Branch Line Bolts in Michigan	31.2757		38.83		36.55		1,627	812			1,864	1,332			1,900	949		
Total Bolts in Mich.	388.1358	tons	342.23	tons	416.47	tons	20,184	13,883			16,427	13,556			21,656	15,390		

Nut Locks:	M	M	M	M	M	M												
East of Marquette	330.759	5.669	263,700	7,500	326.737	39.842	1,719	859	30	15	1,371	1,028	39	29	1,700	1,336	206	103
Marquette to Houghton	209.070	10.002	230,000	12,000	220.407	34.739	1,087	544	52	26	1,196	897	62	47	1,146	855	180	90
Nestoria to State Line	151.395	6.605	166,500	12,700	156.405	28.095	787	394	34	17	866	650	66	50	813	486	146	73
Totals	691.224	22.276	660,200	32,200	703.549	102.676	3,593	1,797	116	58	3,433	2,575	167	126	3,659	2,677	532	266
Total Main Line, Nut Locks in Michigan	691.224		660,200		703,549		3,593	1,797			3,433	2,575			3,659	2,677		
Total Branch Line, Nut Locks in Michigan	22.276		32,200		102.676		116	58			167	126			532	266		
Total Lock Nuts in Michigan	713.500		692,400		806,225		3,709	1,855			3,600	2,701			4,191	2,943		
Rail Braces:																		
East of Marquette	1,603	166	1,760	220	2,900	1,100	185	176	19	18	202	152	25	19	333	316	116	110
Marquette to Houghton	15,403	2,979	16,940	3,560	12,200	11,850	1,771	1,682	342	324	1,948	1,461	409	307	1,403	1,333	1,363	1,294
Nestoria to State Line	8,690	875	9,650	1,760	21,000	2,000	999	949	101	96	1,099	824	202	152	2,415	2,294	230	218
Totals	25,696	4,020	28,350	5,540	36,100	14,850	2,955	2,807	462	438	3,249	2,437	636	478	4,151	3,943	1,709	1,622
Total Main Line Rail Braces in Michigan	25,696		28,350		36,100		2,955	2,807			3,249	2,437			4,151	3,943		
Total Branch Line Rail Braces in Michigan	4,020		5,540		14,850		462	438			636	478			1,709	1,622		
Total Rail Braces in Michigan	29,716		33,890		50,950		3,417	3,245			3,885	2,915			5,860	5,565		
Spikes:	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.												
East of Marquette	12,600.32	1,153.62	12,461	1,395	12,600.32	1,581.66	26,460	19,844	2,423	1,817	23,676	17,757	2,651	1,988	26,460	17,199	3,321	2,159
Marquette to Houghton	8,080.00	1,416.35	8,243	1,455	8,027.80	1,379.24	16,968	12,726	2,975	2,231	15,662	11,747	2,765	2,074	16,858	10,958	2,896	1,883
Nestoria to State Line	6,636.80	612.48	6,701	1,150	6,636.80	1,115.34	13,937	10,453	1,286	964	12,732	9,549	2,185	1,639	13,938	9,060	2,342	1,522
Totals	27,317.12	3,182.45	27,405	4,000	27,264.92	4,076.24	57,365	43,023	6,684	5,012	52,070	39,053	7,601	5,701	57,256	37,217	8,559	5,564
Total Main Line Spikes in Michigan	27,317.12		27,405		27,264.92		57,365	43,023			52,070	39,053			57,256	37,217		
Total Branch Line Spikes in Michigan	3,182.45		4,000		4,076.24		6,684	5,012			7,601	5,701			8,559	5,564		
Total Spikes in Mich.	30,499.57		31,405		31,341.16		64,049	48,035			59,671	44,754			65,815	42,781		

Note:—Balance of Recapitulation is on next sheet.

SUMMARY OF RECAPITULATION — TRACK FASTENINGS

	Quantity			1911		1912		1913	
	1911	1912	1913	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
Total Angle Bars in Michigan	3,547.1724 tons	3,583.85 tons	3,356.95 tons	$ 120,602	$ 93,808	$ 121,851	$ 100,701	$ 114,137	$ 91,248
Total Continuous Joints in Michigan	8,391 joints	12,416 joints	7,987 joints	15,103	13,820	21,107	17,941	14,377	13,766
Total Bolts in Michigan	388.1358 tons	342.23 tons	416.47 tons	20,184	13,883	16,427	13,556	21,656	15,390
Total Nut Locks in Michigan	713.500 M	692.40 M	806.225 M	3,709	1,855	3,600	2,701	4,191	2,943
Total Rail Braces in Michigan	29,716	33,890.	50,950	3,417	3,245	3,885	2,915	5,860	5,565
Total Spikes in Michigan	30,499.57 cwt.	31,405.0 cwt.	31,341.0 cwt.	64,049	48,035	59,671	44,754	65,815	42,781
Total Track Fastenings in Michigan				227,064	174,646	226,541	182,568	226,036	171,693
Added by Mr. H. E. Riggs (Exhibit 50)				9	9				
Total				227,073	174,655	226,541	182,568	226,036	171,693

In the 1911 Appraisal, Turnouts were classed as:

a. Main Line—a turnout from a main track to a main track.
b. Branches—a turnout from a main track to a branch line.
c. Freight Siding—a turnout from any track to a freight side track.
d. Passenger Siding—a turnout from any track to a passenger side track.
e. Freight and Passenger Siding—A turnout from any track to a freight and passenger side track.

I.

The elements that are included in the cost of a turnout in the 1911 and 1913 Appraisals are:

1. Headblock.
2. Switch Ties.
3. Frog.
4. Switch Point.
5. Switch Stand.
6. Connecting Rods.
7. Sliding Plates.
8. Rail Braces.
9. Guard Rails.
10. Switch Lamp.
11. Switch Lock.
12. Freight and Handling Material.
13. Laying and Surfacing Material.

In the 1912 and 1913 Appraisals:

a. Main Track turnout is a turnout from a main track.
A Branch Track Turnout is a turnout from a branch track.
A Side Track Turnout is a turnout from a side track.
Side track turnouts are classed as:
a. Freight and Passenger—a turnout used by Freight and Passenger traffic.
b. Freight—a turnout used by Freight traffic.
c. Passenger—a turnout used by Passenger traffic.

II.

In the 1912 Appraisal the distance in feet from the point of switch to the heel of the frog is multiplied by two and the cost of this length of track is computed. The cost of a turnout is computed as in the 1911 Appraisal and from it is subtracted the value of main track above determined. The result is the quantity used in the Frog and Switch Schedule of the Hansel Appraisal.

From explanations I and II above it is apparent that the Frog and Switch Schedule in the 1911 and 1913 Appraisals can not be compared with the 1912 Appraisal except as to the number of turnouts on each Division and the total number of turnouts on the road. The values in the two cases have entirely different meanings.

The value of the main track in all appraisals has been computed from the mileage, and this includes the cost of track through all turnouts; (a) The amount of rail is too large by the length of main track rail replaced by one rail of a frog. (b) The number of ties is too large by the number of cross ties replaced by switch ties in the turnouts. The Riggs appraisal makes no deduction from the rail schedule but does reduce the tie schedule, by the value of cross ties replaced by switch ties. The Hansel appraisal makes no reduction in either rail or tie schedules, instead it corrects for it in the Frog and Switch Schedule.

The value of side tracks is computed from the length of track measured from the point of switch and is therefore too large. (a) By the amount of rail replaced by the switch rails and one rail of the frog. (b) And by the number of cross ties replaced by the switch ties. The Riggs appraisal reduces the side track schedule by the value of cross ties replaced by switch ties. The Hansel appraisal corrects for this value in the Frog and Switch Schedule.

1911						1912			1913							1911			1912				1913		
	Split Switch Spring Frog	Split Switch Rigid Frog	Stub Switch Rigid Frog	Unit Price	Total Turnouts	Main Track	Side Track	Total Turnouts		Split Switch Spring Frog	Split Switch Rigid Frog	Stub Switch Rigid Frog	Unit Price	Total Turnouts	C.R.	%	P.V.	Value New Each	Value New Total	Present Value Each	Present Value Total	C.R.	%	P.V.
				$									$		$		$	$	$	$	$	$		$
EAST OF MARQUETTE																									
PASSENGER:																									
Sault Ste. Marie to Marquette	Inc	lude	d in	Termi	nals	0	1		Joint 2nd main track		1		172.80		0		0	91	91	54	54	173	65	112
Total Passenger	0	0	0		0	0	1	1		0	1	0		1	0		0		91		54	173		112
FREIGHT::						95																			
Sault Ste. Marie to Marquette																		92	8,740	60	5,700			
(D., S. S. & A. owns 3.67-8.59 interest)*	3			199.20			97		Branch		19		172.80		255	55	140	91	8,827	54	5,238	3,283	65	2,134
(D., S. S. & A. owns 3.67-8.59 interest)*		20		172.80					Joint Branch		2		172.80		1,477	55	812					346	65	225
(D., S. S. & A. owns 3.67-8.59 interest)*			27	135.35					Side Track		50		172.80		1,561	55	858					8,640	55	4,752
			19	135.35					Side Track			6	135.35		2,572	55	1,415					812	55	447
		23		172.80					Joint side track		50		172.80		3,974	55	2,186					8,640	55	4,752
	61			199.20											12,151	55	6,683							
St. Ignace to Soo Junction	32			199.20					Branch		5		172.80		6,374	55	3,506					864	65	562
		33		172.80					Side track		27		172.80		5,702	55	3,136					4,666	55	2,566
			13	135.35					Side track			8	135.35		1,760	55	968					1,083	55	596
Total Freight	96	76	59		231	95	97	192		0	153	14		167	35,826		19,704		17,567		10,938	28,334		16,034

FREIGHT AND PASSENGER:						77													92	7,084	60	4,620							
Sault Ste. Marie to Marquette																														
Main Line (Joint 1.57-3.03 interest)*	1			199.20			31																							
Side tracks	11			199.20																										
Side tracks	58			199.20																										
Side tracks		11		172.80																										
Branches (Joint 0.43-0.87 interest)*		1		172.80																										
Branches	6			199.20																										
St. Ignace to Soo Junction																														
Side track		13		172.80																										
Side track	12			199.20																										
Branches	1			199.20																										
Total Freight and Passenger...	89	25	0		114	77	31	108			51	133	0		184	21,864		13,197		9,905		6,294		33,141		21,422			
Total Freight	96	76	59			95	97				0	153	14			35,826		19,704		17,567		10,938		28,334		16,034			
Total Passenger	0	0	0			0	1				0	1	0			0		0		91		54		173		112			
Total East of Marquette	185	101	59		345	172	129	301			51	287	14		352	57,690		32,901		27,563		17,286		61,648		37,568			
MARQUETTE TO HOUGHTON																														
PASSENGER:																			92	368	60	240								
Marquette to Nestoria						4																								
Side track		8		172.80			6					8		172.80		1,382	60	829	91	546	54	324		1,382	60	829			
	2			199.20												398	60	239											
Total Passenger	2	8	0		10	4	6	10			0	8	0		8	1,780		1,068		914		564		1,382		829			
FREIGHT:																														
D., S. S. & A. owns 9.66-21.43*			66	135.35		116																								
Marquette to Nestoria																														
Branch		24		172.80												4,027	55	2,215	92	10,672	60	6,960		4,147	65	2,696			
D., S. S. & A. owns 9.66-21.43*		101		172.80			328																							
Joint branch		1		172.80												7,867	55	4,327	91	29,848	54	17,712		173	65	112			
D., S. S. & A. owns 9.66-21.43*	3			199.20																										
Side track	78			172.80												269	55	148						13,478	55	7,413			
	68			199.20																										
Side track													6	135.35		13,546	55	7,450						812	55	447			
		188		172.80																										
Joint side track		2		172.80												32,486	55	17,867						346	55	190			
			168	135.35																										
Nestoria to Houghton																														
Side track		25		172.80												22,739	55	12,506						4,320	55	2,376			
Total Freight	71	289	234		594	116	328	444			0	130	6		136	80,934		44,513		40,520		24,[illegible]		23,276		13,234			

* Proportion applies to (1911) Appraisal only.
Quantities are the total number of Frogs and Switches
Amounts are the values apportioned to D., S. S. & A.

1911						1912			1913							1911			1912				1913		
	Split Switch Spring Frog	Spit Switch Rigid Frog	Stub Switch Rigid Frog	Unit Price	Total Turnouts	Main Track	Side Track	Total Turnouts		Spit Switch Spring Frog	Spit Switch Rigid Frog	Stub Switch Rigid Frog	Unit Price	Total Turnouts	C.R.	%	P.V.	Value New Each	Value New Total	Present Value Each	Present Value Total	C.R.	%	P.V.
				$									$		$		$	$	$	$				
FREIGHT AND PASSENGER:																								
Marquette to Houghton									Marquette to Nestoria															
Main Line	8			199.20		89			Main track	15			199.20		1,594	65	1,036	92	8,188	60	5,340	2,988	65	1,94
Branches (D., S. S. & A. owns 1.59-3.71 interest)*	4			199.20			44		Main track		111		172.80		341	65	222	91	4,004	54	2,376	19,181	65	12,46
Branches	15			199.20					Side track		28		172.80		2,988	65	1,942					4,838	55	2,66
									Nestoria to Houghton															
Branches		4		172.80					Main track	17			199.20		691	65	449					3,386	65	2,20
Side Tracks	44			199.20					Main track		42		172.80		8,765	60	5,259					7,258	65	4,71
Side Tracks		45		172.80					Branch		6		172.80		7,776	60	4,666					1,037	65	67
									Side track		1		172.80									173	55	9
Total Freight and Passenger...	71	49	0		120	89	44	133		32	188	0		220	22,155		13,574		12,192		7,716	38,861		24,75
ORE:																								
									Marquette to Nestoria															
									Main track		16		172.80									2,765	65	1,79
									Branch		17		172.80									2,938	65	1,91
									Joint Branch		22		172.80									3,802	65	2,47
									Side track		133		172.80									22,982	55	12,64
									Side track			5	135.35									677	55	37
									Joint side track		62		172.80									10,714	55	5,89
Total Ore	0	0	0		0	0	0	0		0	250	5		255	0		0		0		0	43,878		25,08
Total Freight and Passenger...	71	49	0			89	44			32	188	0			22,155		13,574		12,192		7,716	38,861		24,75

| | | |

COMPARISON OF THE 1911, 1912 AND 1912 APPRAISALS — FROGS, SWITCHES AND CROSSINGS —Continued

CROSSINGS

1911	1912	1913	Allocation	1911			1912			1913		
				C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				$		$	$		$	$		$
SAULT STE. MARIE TO MARQUETTE:												
Main line crossings 3 @ $311.60	No classification made of crossings —total only, given 24 @ $315.	Same as 1911 3	Freight and Passenger	934	60	560				935	60	561
							7,560	60	4,536			
ST. IGNACE TO SOO JUNCTION:												
Main line crossings 1 @ $311.60		Same as 1911 1	Freight and Passenger	312	60	187				312	60	187
MARQUETTE TO HOUGHTON:		MARQUETTE TO NESTORIA:										
Main line crossings 12 @ $311.60		Main line 3 @ $311.60	Freight and Passenger							935	60	561
		Main line 3 311.60	Ore	3,739	60	2,244				935	60	561
Crossings over freight sidings 7 311.60		Branch line 3 311.60	Ore	2,181	60	1,309				935	60	561
		Side track 3 311.60	Ore							935	60	561
		NESTORIA TO HOUGHTON: None										
NESTORIA TO STATE LINE:												
Main line crossings 1 @ $311.60		Same as 1911 1	Freight and Passenger	312	60	187				312	60	187
Total 24	24	17		7,478		4,487	7,560		4,536	5,299		3,179
		The seven side track crossings were omitted by mistake										

RECAPITULATION FROGS, SWITCHES and CROSSINGS

	Number			1911		1912		1913	
	1911	1912	1913	C. R.	P. V.	C. R.	P. V.	C. R.	P. V.
Total Frogs and Switches	1,203	1,034	1,134	$188,348	$106,639	$94,522	$58,644	$198,400	$119,881
Total Crossings	24	24	17	7,478	4,487	7,560	4,536	5,299	3,179
Total in Michigan				$195,826	$111,126	$102,122	$63,180	$203,699	$123,060
Deducted by Mr. Riggs in Exhibit 50				6,377	3,405				
Modified total in Michigan				$189,449	$107,721	$102,122	$63,180	$203,699	$123,060

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS

Schedule No. 10
BALLAST

	1911				1912	1913					1911			1912				1913		
	Miles				Ballast	Miles														
	Track	Deduct for Bridges	Ballast	Cost Per Mile	Cu.Yds.	Track	Deduct for Bridges	Ballast	Cost Per Mile	Allocation	C.R.	%	P.V.	Per Cu. Yd.	C.R.	Per Cu. Yd.	P.V.	C.R.	%	P.V.
This schedule in all exhibits does not include Ballast for Side Tracks.				$					$		$		$	c /	$	c	$	$		$
EAST OF MARQUETTE:																				
Main Line																				
Gravel																				
1st main track, S. S. Marie to Marquette—St. Ignace gravel	94.11	0.62	93.49	1,605				93.50	1,605	F.& P.	150,051	100	150,051					150,068	100	150,068
Joint 1st main track—S. S. Marie to Marquette—St. Ignace gravel	0.11	0.00	0.11	1,605				0.11	1,605	F.& P.	177	100	177					177	100	177
Joint 1st main track S. S. Marie to Marquette—St. Ignace gravel	0.25	0.00	0.25	1,605				0.25	1,605	F.& P.	401	100	401					401	100	401
Joint 2nd main track S. S. Marie to Marquette—St. Ignace gravel	0.27	0.00	0.27	1,605				0.27	1,605	F.& P.	433	100	433					433	100	433
St. Ignace to Soo Junction St. Ignace gravel	40.17	0.14	40.03	1,605				40.05	1,605	F.& P.	64,248	100	64,248					64,248	100	64,280
1st main track, S. S. Marie to Marquette—gravel	18.74	0.03	18.71	1,605				18.62	1,605	F.& P.	30,030	100	30,030					29,885	100	29,885
Total Gravel Ballast East of Marquette	153.65	0.79	152.86		433,860			152.80			245,340		245,340	55	238,623	46	199,577	245,244		245,244
Cinders																				
S. S. Marie to Marquette	27.00	0.33	26.67	600				26.82	600	F.& P.	16,002	100	16,002					16,092	100	16,092

Joint 1st main track																						
S. S. Marie to Marquette	0.08	0.00	0.08	600				0.08	600	F.& P.	48	100	48					48	100	48
Joint 2nd main track																						
S. S. Marie to Marquette	0.08	0.00	0.08	600				0.08	600	F.& P.	49	100	49					48	100	48
St. Ignace to Soo Junction	2.80	0.00	2.80	600				2.80	600	F.& P.	1,680	100	1,680					1,680	100	1,680
Total Cinder Ballast East of Marquette	29.96	0.33	29.63		73,800			29.78			17,779		17,779	40	29,520	34	25,092	17,868		17,868
Sand																						
1st main track																						
S. S. Marie to Marquette	12.49	0.20	12.29	600				12.41	600	F.& P.	7,374	100	7,374					7,446	100	7,446
Joint 1st main track																						
S. S. Marie to Marquette	0.39	0.00	0.39	600				0.39	600	F.& P.	234	100	234					234	100	234
Joint 2nd main track																						
S. S. Marie to Marquette	0.39	0.00	0.39	600				0.39	600	F.& P.	233	100	233					234	100	234
Total Sand Ballast East of Marquette	13.27	0.20	13.07		22,340			13.19			7,841		7,841	40	8,936	34	8,595	7,914		7,914
Total Gravel Ballast East of Marquette	153.65	0.79	152.86		433,860			152.80			245,340		245,340	55	238,623	46	199,577	245,244		245,244
Total Cinder Ballast East of Marquette	29.96	0.33	29.63		73,800			29.78			17,779		17,779	40	29,520	34	25,092	17,868		17,868
Total Main Line Ballast East of Marquette	196.88	1.32	195.56		530,000	196.88	1.11	195.77			270,960		270,960		277,079		232,264	271,026		271,026
Branches																						
Sand																						
S. S. Marie to Marquette	15.40	0.00	15.40	600		22.83	0.00	22.83	600	F.	9,240	100	9,240					13,698	100	13,698
S. S. Marie to Marquette (Joint Branches)	0.43	0.00	0.43	600		0.43	0.00	0.43	600	F.	261	100	261					258	100	258
St. Ignace to Soo Junction	4.06	0.00	4.06	600		4.01	0.00	4.01	600	F.	2,436	100	2,436					2,406	100	2,406
Total Ballast, Branches, East of Marquette	19.89		19.89		50,650	27.27	0.00	27.27			11,937		11,937	40	20.260	34	17,221	16,362		16,362
Total Ballast, Main Line, East of Marquette	196.88	1.32	195.56		530,000	196.88	1.11	195.77			270,960		270,960		277,079		232,264	271,026		271,026
Total Ballast East of Marquette	216.77	1.32	215.45		580.650	224.15	1.11	223.64			282,897		282,897		297,339		249,485	287,388		287,388
MARQUETTE TO HOUGHTON:																						
Main Line																						
Gravel																						
1st main track																						
Marquette to Nestoria								44.72	1,605	F.& P.								71,776	100	71,77

	1911				1912	1913					1911			1912				1913		
	Miles				Ballast	Miles														
	Track	Deduct for Bridges	Ballast	Cost Per Mile	Cu.Yds.	Track	Deduct for Bridges	Ballast	Cost Per Mile	Allocation	C.R.	%	P.V.	Per Cu. Yd.	C.R.	Per Cu. Yd.	P.V.	C.R.	%	P.V.
				$					$		$		$	¢	$	¢	$	$		$
1st main track Nestoria to Houghton								7.44	1,605	F.& P.								11,941	100	11,941
1st main track, south line, Marquette to Eagle Mills								8.40	1,605	F.& P.								13,482	100	13,482
1st main track, south line, Eagle Mills to Winthrop Jct.								8.80	1,605	Ore								14,124	100	14,124
2nd main track Marquette to Nestoria								5.06	1,605	F.& P.								8,121	100	8,121
1st main track, Humboldt to Republic (Republic Branch)								8.69	1,605	F.& P.								13,947	100	13,947
Total Gravel Ballast, Main Line Marquette to Houghton	83.62	0.60	83.02	1,605	230,520			83.11			133,247	100	133,247	55	126,786	46	106,039	133,391		133,391
Cinders																				
1st Main track, Marquette to Nestoria								2.00	600	F.&P.								1,200	100	1,200
1st main track Nestoria to Houghton								12.13	600	F.& P.								7,278	100	7,278
Total Cinders, Main Line, Marquette to Houghton	14.13	0.02	14.11	600	30,000			14.13			8,466	100	8,466	40	12,000	34	10,200	8,478		8,478
Total Sand, Main Line, Marquette to Houghton	7.70	0.02	7.68	600	16,860			4.68	600	F.& P.	4,608	100	4,608	40	6,744	34	5,732	2,808	100	2,808
Total Stamp Sand, Main Line, Marquette to Houghton	20.80	0.37	20.43	1,605	67,210			23.43	1,605	F.& P.	32,790	100	32,790	40	26,884	34	22,851	37,605	100	37,605
Total Gravel, Main Line, Marquette to Houghton	83.62	0.60	83.02	1,605	230,520			83.11			133,247	100	133,247	55	126,786	46	106,039	133,391		133,391
Total Main Line Ballast, Marquette to Houghton	126.25	1.01	125.24		344,590	126.25	0.90	125.35			179,111		179,111		172,414		144,822	182,282		182,282

Branches																				
Sand																				
Marquette to Nestoria						4.46	0.00	4.46	600	F.							2,676	100	2,676	
Eagle Mills to Winthrop Jct.						16.05	0.00	16.05	600	Ore							9,630	100	9,630	
Nestoria to Houghton						1.90	0.00	1.90	600	F.							1,140	100	1,140	
Marquette to Houghton Joint Branches						1.37	0.00	1.37	600	Ore							822	100	822	
Total Ballast, Branches, Marquette to Houghton	24.42	0.00	24.42	600	52,690	23.78	0.00	23.78			14,652	100	14,652	40	21,076	34	17,915	14,268		14,268
Total Ballast Main Line, Marquette to Houghton	126.25	1.01	125.24		344,590	126.25	0.90	125.35			179,111		179,111		172,414		144,822	182,282		182,282
Total Ballast, Marquette to Houghton	150.67	1.01	149.66		397,280	150.03	0.90	149.13			193,763		193,763		193,490		162,737	196,550		196,550
NESTORIA TO STATE LINE:																				
Main Line																				
Gravel	103.70	1.58	102.12	1,605	289,720	101.47	1.14	100.33	1,605	F.& P.	163,902	100	163,902	55	159,346	46	133,271	161,030	100	161,030
Cinders					1,970									40	788	34	670			
Total Ballast, Main Line, Nestoria to State Line	103.70	1.58	102.12		291,690	101.47	1.14	100.33			163,902	100	163,902		160,134		133,941	161,030		161,030
Branches																				
Sand																				
Total Ballast, Branches, Nestoria to State Line	10.56	0.00	10.56	600	42,110	21.46	0.16	21.30	600	F.	6,336	100	6,336	40	16,844	34	14,317	12,780	100	12,780
Total Ballast, Nestoria to State Line	114.26	1.58	112.68		333,800	122.93	1.30	121.63			170,238		170,238		176,978		148,258	173,810		173,810

RECAPITULATION

	1911			1912		1913			1911		1912		1913	
	Miles					Miles								
	Track	Deduct For Bridges	Ballast	Track Miles*	Ballast, Cu. Yds	Track	Deduct For Bridges	Ballast	C.R. $	P.V. $	C.R. $	P.V. $	C.R. $	P.V. $
East of Marquette	216.77	1.32	215.45	220.81	580,650	224.15	1.11	223.04	282,897	282,897	297,339	249,485	287,388	287,388
Marquette to Houghton	150.67	1.01	149.66	150.31	397,280	150.03	.90	149.13	193,763	193,763	193,490	162,737	196,550	196,550
Nestoria to State Line	144.26	1.58	112.68	122.93	333,800	122.93	1.30	121.63	170,238	170,238	176,978	148,258	173,810	173,810
Total in Michigan	481.70	3.91	477.19	494.05	1,311,730	497.11	3.31	493.80	646,898	646,898	667,807	560,480	657,748	657,748
Added by Mr. H. E. Riggs (Exhibit 50)									4	4				
Total									646,902	646,902	667,807	560,480	657,748	657,748

* Miles of Ballast shown is taken from Exhibit 15, page 8 as Ballast Schedule does not give Mileage.

Riggs—1911—Exhibit 1				Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A				1911			1912			1913		
	Page in Exhibit 1	Miles	Unit Cost		Miles	Unit Cost		Miles	Unit Cost	Allocation	C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
			$			$			$		$		$	$		$	$		$
EAST OF MARQUETTE:																			
Main Line																			
1st main track				1st main track			1st main track, S. S.												
S. S. Marie to Marquette	168	152.34	526	East of Marquette	195.31	600	Marie to Marquette	152.34	526	F.& P.	80,121	100	80,131	117,186	100	117,186	80,131	100	80,131
Joint 1st main track																			
S. S. Marie to Marquette	168	0.83	526		0.83	600		0.83	526	F.& P.	437	100	437	498	100	498	437	100	437
Joint 2nd main track																			
S. S. Marie to Marquette	168	0.74	526		0.74	600		0.74	526	F.& P.	389	100	389	444	100	444	389	100	389
1st main track																			
St. Ignace to Soo Junction	168	42.97	526					42.97	526	F.& P.	22,602	100	22,602				22,602	100	22,602
Total Main Line		196.88			196.88			196.88			103,559		103,559	118,128		118,128	103,559		103,559
Branches																			
S. S. Marie to Marquette	168	15.40	526		23.50	600		22.83	526	F.	8,100	100	8,100	14,100	100	14,100	12,009	100	12,009
S. S. Marie to Marquette, joint	168	0.43	526		0.43	600		0.43	526	F.	226	100	226	258	100	258	226	100	226
St. Ignace to Soo Junction	168	4.06	526					4.01	526	F.	2,136	100	2,136				2,109	100	2,109
Total Branches		19.89			23.93			27.27			10,462		10,462	14,358		14,358	14,344		14,344
Total Main Line		196.88			196.88			196.88			103,559		103,559	118,128		118,128	103,559		103,559
Total East of Marquette		216.77			220.81			224.15			114,02'		114,021	132,486		132,486	117,903		117,903
MARQUETTE TO HOUGHTON:																			
Main Line																			
1st main track track, north line	168	121.17	526		121.17	600		46.90	526	F.& P.	63,735	100	63,735	72,202	100	72,202	24,669	100	24,669
MARQUETTE TO NESTORIA																			
2nd main track																			
Marquette to Nestoria	168	5.08	526		5.08	600		5.08	526	F.& P.	2,672	100	2,672	3,048	100	3,048	2,672	100	2,672

Main track, south line																					
Marquette to Eagle Mills								8.50	526	F.& P.						4,471	100	4,471
Main track, south line																					
Eagle Mills to Winthrop Jc.								8.83	526	Ore						4,645	100	4,645
Main track																					
Nestoria to Houghton								48.24	526	F.& P.						25,374	100	25,374
Main track, Republic branch								8.70	526	F.& P.						4,576	100	4,576
Total Main Line		126.25			126.25			126.25			66,407		66,407	75,750		75,750	66,407		66,407
Branches																					
Marquette to Nestoria	168	20.83	526		22.41	600		16.05	526	Ore	10,957	100	10,957	13,446	100	13,446	8,442	100	8,442
Marquette to Nestoria								4.46	526	F.							2,346	100	2,346
Marquette to Nestoria, joint	168	1.59	526		1.65	600		1.37	526	Ore	836	100	836	990	100	990	721	100	721
Nestoria to Houghton	168	2.00						1.90	526	F.	1,052		1,052				999	100	999
Total Branches		24.42			24.06			23.78			12,845		12,845	14,436		14,436	12,508		12,508
Total Main Line		126.25			126.25			126.25			66,407		66,407	75,750		75,750	66,407		66,407
Total Marquette to Houghton		150.67			150.31			150.03			79,252		79,252	90,186		90,186	78,915		78,915
NESTORIA TO STATE LINE.																					
Main Line																					
Main track																					
Nestoria to State Line	168	103.70	526		103.70	600		101.47	526	F.& P.	54,546	100	54,546	62,220	100	62,220	53,373	100	53,373
Total Main Line		103.70			103.70			101.47			54,546		54,546	62,220		62,220	53,373		53,373
Branches																					
Nestoria to State Line	168	10.56	526		19.23	600		21.46	526	F.	5,555	100	5,555	11,538	100	11,538	11,288	100	11,288
Total Branches		10.56			19.23			21.46			5,555		5,555	11,538		11,538	11,288		11,288
Total Main Line		103.70			103.70			101.47			54,546		54,546	62,220		62,220	53,373		53,373
Total Nestoria to State Line		114.26			122.93			122.93			60,101		60,101	73,758		73,758	64,661		64,661

RECAPITULATION — TRACK LAYING AND SURFACING

	1911		1912		1913		1911				1912				1913			
	Main Line	Branch	Main Line	Branch	Main Line	Branch	Main Line		Branch		Main Line		Branch		Main Line		Branch	
	Miles	Miles	Miles	Miles	Miles	Miles	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
							$	$	$	$	$	$	$	$	$	$	$	$
East of Marquette	196.88	19.89	196.88	23.93	196.88	27.27	103,559	103,559	10,462	10,462	118,128	118,128	14,358	14,358	103,559	103,559	14,344	14,344
Marquette to Houghton	126.25	24.42	126.25	24.06	126.25	23.78	66,407	66,407	12,845	12,845	75,750	75,750	14,436	14,436	66,407	66,407	12,508	12,508
Nestoria to State Line	103.70	10.56	103.70	19.23	101.47	21.46	54,546	54,546	5,555	5,555	62,220	62,220	11,538	11,538	53,373	53,373	11,288	11,288
Total	426.83	54.87	426.83	67.22	424.60	72.51	224,512	224,512	28,862	28,862	256,098	256,098	40,332	40,332	223,339	223,339	38,140	38,140
Total Main Line	426.83		426.83		424.60		224,512	224,512			256,098	256,098			223,339	223,339		
Total Branches	54.87		67.22		72.51		28,862	28,862			40,332	40,332			38,140	38,140		
Total in Michigan	481.70		494.05		497.11		253,374	253,374			296,430	296,430			261,479	261,479		
Added by Mr. Riggs in Exhibit 50 Transferred from Terminals							7	7										
Total							253,381	253,381			296,430	296,430			261,479	261,479		

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
			C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
ENTIRE LINE	EAST OF MARQUETTE:	SAULT STE. MARIE TO MARQUETTE:									
Michigan Fencing:—In general over two-thirds of the main line is fenced both sides. Fencing of cedar posts, some spaced 8 ft. some 12 ft. Part of the line is of 4 wire, part 5 wire construction.		Freight and Passenger									
	Main Line	Main Line									
	Wire Fence 237 Miles @ $160	Right of way fence, wire									
	Snow Fence 42,000 feet @ 0.15	132 miles @ $160.00				37,920	50	18,960	21,120	75	15,840
		Permanent snow fence				6,330	65	4,115			
		10 ft. high 10,900 lin. ft. 33⅓c							3,652	75	2,739
		10 ft. high 350 lin. ft. 33⅓c							117	80	94
		12 ft. high 3,500 lin. ft. 40c							1,400	75	1,050
		Portable snow fence									
		8 ft. high 1,000 lin. ft. 26c							260	75	195
		Total 15,750 lin. ft.							26,549		19,918
		Freight									
		Branches									
	Branches	Right of way fence, wire									
	Wire Fence 24 miles @ $160.00	4 miles @ $160.00				3,840	50	1,920	640	75	480
		Total Freight							640		480
		ST. IGNACE TO SOO JUNCTION	95,880	50	47,940						
		Freight and Passenger									
		Main Line	2,960	50	1,480						
		Right of way fence, wire									
		23.2 miles @ $160.00							3,712	75	2,784
		Permanent snow fence	6,345	75	4,759						
		8 ft. high 1,760 lin. ft. @ 26c							458	80	366
		10 ft. high 1,520 lin. ft. 33⅓c							509	80	407
		10 ft . high 800 lin. ft. 33⅓c							268	100	268
		Total 4,080 lin. ft.									
		Total Freight and Passenger							4,947		3,825
Over $6,000 was spent in fencing 1902 to 1906 and over $2,000 in new fencing in 1910 and 1911. It is assumed that these expenditures will maintain the condition, there for, no additional mileage is included.	Total East of Marquette					48,090		24,995	32,136		24,229

Snow Fence, 3.7 miles reported in 1900 @ $800.00

Snow Fence—actual cost of new construction, 1902 to 1911 inclusive.

Total fence in Michigan, June 30, 1906—599.25 miles.

We accept the mileage as given to the Michigan Railroad Commission having satisfied ourselves that it is conservative.

No attempt has been made to separate the fencing by divisions nor to secure the exact mileage or location of the different knids of fence. We have computed all fence on the basis of 4 wire posts 12 ft. centers @ 50c per rod or $160.00 per mile of fence.

Marquette to Houghton:			**Marquette to Nestoria:**											
			Freight and Passenger											
Main Line			Main Line, North											
Wire Fence	205 miles @ $160.00		Right of way wire fence						32,800	50	16,400	13,760	75	10,320
Snow Fence	22,200 feet	0.15	86 miles @ $160.00						3,330	65	2,165			
			Permanent snow fence											
			6 ft. high	600 lin. ft. @	22c							132	50	66
			6 ft. high	1,240 lin. ft.	22c							273	60	164
			8 ft. high	350 lin. ft.	26c							91	50	46
			8 ft. high	800 lin. ft.	26c							208	60	125
			8 ft. high	800 lin. ft.	26c							208	75	156
			10 ft. high	2,900 lin. ft.	33⅓c							972	50	486
			10 ft. high	1,500 lin. ft.	33⅓c							502	60	301
			10 ft. high	2,900 lin. ft.	33⅓c							972	80	778
			10 ft. high	720 lin. ft.	33⅓c							241	100	241
			12 ft. high	1,600 lin. ft.	40c							640	80	512
			12 ft. high	4,000 lin. ft.	40c							1,600	100	1,600
			Portable snow fence											
			8 ft. high	500 lin. ft.	26c							130	60	78
			8 ft. high	320 lin. ft.	26c							83	75	62
			8 ft. high	1,760 lin. ft.	26c							458	80	366
			8 ft. high	512 lin. ft.	26c							133	100	133
			Total	20,502 lin. ft.										
			Main Line, South (Marquette to Eagle Mills)											
			Right of way wire fence											
			12.34 miles @ $160.00									1,974	75	1,480
			Permanent snow fence											
			6 ft. high	2,000 lin. ft. @	22c							440	50	220
			12 ft. high	830 lin. ft.	40c							332	100	332
			Portable snow fence											
			8 ft. high	990 lin. ft.	40c							396	75	297
			Total	3,820 lin. ft.										
			Branches (Humboldt to Republic)											
			Right of way wire fence											
			16 miles @ $160.00									2,560	75	1,920
			Total Freight and Passenger									26,105		19,683

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
		Freight			$	$		$	$		$
		Branches									
		Right of way fence, wire									
		3 miles @ $160.00							480	75	360
	Branches										
	Wire fence 24 miles @ $160.00	Total Freight			/	3,840	50	1,920	480		360
		Ore									
		Main Line (Eagle Mills to Winthrop Junction)									
		Right of way fence, wire									
		17.66 miles @ $160.00							2,826	75	2,120
		Branches									
		Right of way fence, wire									
		23.8 miles @ $160.00							3,808	75	2,856
		Total Ore							6,634		4,976
		NESTORIA TO HOUGHTON:									
		Freight and Passenger									
		Main Line									
		Right of way fence, wire									
		84 miles @ $160.00							13,440	75	10,080
		Permanent snow fence									
		10 ft. high 100 lin. ft. @ 33⅓c							34	90	31
		10 ft. high 12,00 lin. ft. 33⅓c							402	100	402
		Portable snow fence									
		8 ft. high 100 lin. ft. 26c							26	75	20
		8 ft. high 320 lin. ft. 26c							83	80	66
		Total 1,720 lin. ft.									
		Total Freight and Passenger							13,985		10,599
	Total Marquette to Houghton					39,970		20,485	47,204		35,618

NESTORIA TO STATE LINE:		NESTORIA TO STATE LINE:										
Main Line		Freight and Passenger										
Wire Fence 153 miles @	$160.00	Main Line										
Snow Fence 23,800 feet	0.15	Right of way fence, wire										
		147 miles @	$160.00				24,480	50	12,240	23,520	75	17,640
		Permanent snow fence										
		10 ft. high	2,880 lin. ft. @	33⅓c			3,570	65	2,320	965	75	724
		10 ft. high	1,696 lin. ft.	33⅓c						568	80	454
		10 ft. high	7,056 lin. ft.	33⅓c						2,364	90	2,128
		10 ft. high	1,920 lin. ft.	33⅓c						643	95	611
		8 ft. high	480 lin. ft.	26c						125	60	75
		8 ft. high	448 lin. ft.	26c						116	80	93
		Portable snow fence										
		8 ft. high	400 lin. ft.	26c						104	75	78
		8 ft. high	6,320 lin. ft.	26c						1,643	80	1,314
		8 ft. high	960 lin. ft.	26c						250	95	238
		Total	22,160 lin. ft.									
Branches		Total Freight and Passenger								30,298		23,355
17 miles of wire fence @	$160.00						2,720	50	1,360			
Total NESTORIA TO STATE LINE							30,770		15,920	30,298		23,355

RECAPITULATION — FENCING

	Miles			1911		1912		1913	
	1911	1912	1913	C.R.	P.V.	C.R.	P.B.	C.R.	P.V.
				$	$	$	$	$	$
Main Line—Wire Fence	599.25	595.00	502.20						
Snow Fence	3.7	16.70	12.84						
Branches —Wire Fence		65.00	46.80						
EAST OF MARQUETTE						48,090	24,995	32,136	24,223
MARQUETTE TO HOUGHTON						39,970	20,485	47,204	35,618
NESTORIA TO STATE LINE						30,770	15,920	30,298	23,355
TOTAL IN MICHIGAN	602.95	676.70	561.84	105,185	54,179	118,830	61,400	109,638	83,196

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS — CROSSINGS, CATTLE GUARDS AND SIGNS

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A			Allo.	1911			1912			1913		
						C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
						$		$	$		$	$		$
STREET AND HIGHWAY CROSSINGS:	Street and Highway Crossings:													
Highway Crossings 173 @$15.92	Highway Crossings 173 @$10.00	Street and Highway Crossings:												
Street Crossings single track 131 34.19	Street crossings single track 131 25.00	Sault Ste. Marie to Marquette	34	@$18.00	F.& P.	2,754	60	1,652	1,730	60	1,038	612	60	367
	60 lb scrap rail in street crossings 45 tons 14.00	St. Ignace to Soo Junction	13	18.00	F.& P.	4,479	60	2,687	3,275	60	1,965	234	60	140
									630	100	630			
		Marquette to Nestoria	23	18.00	F.& P.							414	60	248
		Marquette to Nestoria	2	18.00	F.							36	60	22
		Marquette to Nestoria	2	18.00	Ore							36	60	22
		Nestoria to Houghton	41	18.00	F.& P.							738	60	443
		Nestoria to State Line	32	18.00	F.& P.							576	60	346
		Street Crossings:												
		In Marquette												
		8.7 M.B.M.	@$31.00	270										
		150 c.y. crushed stone	0.50	75										
		51.6 T rail	16.00	826										
		Labor		293										
				1,464	F.& P.							1,464	80	1,171
		In Negaunee												
		19.9 M.B.M.	@$31.00	617										
		80 c.y. crushed stone	0.50	40										
		8.8 T. rail	16.00	141										
		Labor		200										
				998	F.& P.							998	80	798
		In Ishpeming												
		18.5 M.B.M.	@$31.00	574										

		70 c.y. crushed stone	0.50	35													
		6.6 T. rail	16.00	106													
		Labor		180													
				895	F.& P.										895	75	671
Total Street and High Way Crossings in Michigan						7,233		4,339	5,635		3,633	6,003		4,228
OVERHEAD CROSSINGS (Marquette) 2 @ $500	Overhead Crossings (Marquette) 2 @ $500	Overhead Crossings in Marquette:	2 @ $500		F.& P.	1,000	60	600	1,000	60	600	1,000	60	600
Total Overhead Crossings in Michigan						1,000		600	1,000		600	1,000		600
FARM CROSSINGS: 70 @$10.00	Farm Crossings and Fence Gates 70 @$10.00	Farm Crossings:				700	60	420	700	60	420			
		Sault Ste. Marie to Marquette	31	@ $10	F.& P.							310	60	186
		St. Ignace to Soo Junction	11	10	F.& P.							110	60	66
		Marquette to Nestoria	20	10	F.& P.							200	60	120
		Marquette to Nestoria	1	10	F.							10	60	6
		Marquette to Nestoria	2	10	Ore							20	60	12
		Nestoria to Houghton	25	10	F.& P.							250	60	150
		Nestoria to State Line	25	10	F.& P.							250	60	150
Total Farm Crossings in Michigan						700		420	700		420	1,150		690
CATTLE GUARDS:	Cattle Guards:	Cattle Guards:												
43 Pit Guards estimated @ $60 per guard	Steel surface cattle guards and wing fences, including 44 wooden pit cattle guards	Sault Ste. Marie to Marquette												
		Wood pit cattle guards	4	@ $60	F.& P.	2,580	50	1,290				240	50	120
Steel surface cattle guards 196 @$20.00	240 @$20.00	Steel surface cattle guards	54	20	F.& P.							1,080	90	972
		St. Ignace to Soo Junction				3,920	90	3,528	4,800	90	4,320			
		Steel surface cattle guards	23	20	F.& P.							460	90	414
		Marquette to Nestoria												
		Wood pit cattle guards	1	60	F.& P.							60	50	30
		Steel surface cattle guards	45	20	F.& P.							900	90	810
		Wood pit cattle guards	3	60	F.							180	20	36
		Steel surface cattle guards	2	20								40	90	36
		Steel surface cattle guards	4	20	Ore							80	90	72
		Nestoria to Houghton												
		Steel surface cattle guards	46	20	F.& P.							920	90	828
		Nestoria to State Line												
		Steel surface cattle guards	71	20	F.& P.							1,420	90	1,278
Total Cattle Guards in Michigan						6,500		4,818	4,800		4,320	5,380		4,596

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A			Allo.	1911			1912			1913		
						C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
STATION SIGNS:	Station Signs:	Station Signs at Stations:				$		$	$		$	$		$
90 @ $2	90 @ $2					180	90	162	180	90	162			
		Sault Ste. Marie to Marquette	53	@ $2	F.& P.							106	90	95
		St. Ignace to Soo Junction	21	2	F.& P.							42	90	38
		Marquette to Nestoria	17	2	F.& P.							34	90	31
		Nestoria to Houghton	21	2	F.& P.							42	90	38
		Nestoria to State Line	49	2	F.& P.							98	90	88
			161											
Total Station Signs at	Stations in Michigan					180		162	180		162	322		290
MILE POSTS: 420 @ $2	Mile Posts: 420 @ $2	Mile Posts:				840	75	630	840	75	630			
		Sault Ste. Marie to Marquette	152	@ $2	F.& P.							304	75	228
		St. Ignace to Soo Junction	42	2	F.& P.							84	75	63
		Marquette to Nestoria	66	2	F.& P.							132	75	99
		Marquette to Nestoria	17	2	Ore							34	75	26
		Nestoria to Houghton	48	2	F.& P.							96	75	72
		Nestoria to State Line	101	2	F.& P.							202	75	152
			426											
Total Mile Posts in Michigan						840		630	840		630	852		640
WHISTLE POSTS: 600 @ $1	Whistle Posts: 600 @ $1	Whistle Posts:				600	75	450	600	75	450			
		Sault Ste. Marie to Marquette	150	@ $1	F.& P.							150	75	112
		St. Ignace to Soo Junction	60	1	F.& P.							60	75	45
		Marquette to Nestoria	110	1	F.& P.							110	75	82
		Marquette to Nestoria	6	1	F.							6	75	4
		Marquette to Nestoria	8	1	Ore							8	75	6
		Nestoria to Houghton	150	1	F.& P.							150	75	112
		Nestoria to State Line	140	1	F.& P.							140	75	105
			625											
Total Whistle Posts in	Michigan					600		450	600		450	624		466

ONE MILE TO STATION SIGNS: 112 @ $2	One Mile to Station Signs: 112 @ $2	One Mile to Station Signs:														
		Sault Ste. Marie to Marquette	76	@	$2	F.& P.	224	70	157	224	70	157	152	70	106
		St. Ignace to Soo Junction	27		2	F.& P.							54	70	38
		Marquette to Nestoria	34		2	F.& P.							68	70	48
		Marquette to Nestoria	5		2	Ore							10	70	7
		Nestoria to Houghton	28		2	F.& P.							56	70	39
		Nestoria to State Line	56		2	F.& P.							112	70	78
			226												
Total One Mile to Station Signs in Michigan							224		157	224		157	452		316
RAILROAD CROSSING SIGNS: 173 @ $4	Railroad Crossing Signs: 173 @ $4	Railroad Crossing Signs:					692	60	415	692	60	415			
		Sault Ste. Marie to Marquette													
		Railway crossing 400 ft. signs	2	@	$4	F.& P.							8	75	6
		Railway crossing signs at highways	24		4	F.& P.							96	60	58
		St. Ignace to Soo Junction													
		Railway crossing, 400 ft. signs	2		4	F.& P.							8	75	6
		Railway crossing signs at highways	12		4	F.& P.							48	60	29
		Marquette to Nestoria													
		Railway crossing, 400 ft. signs	12		4	F.& P.							48	75	36
		Railway crossing signs at highways	23		4	F.& P.							92	60	55
		Railway crossing signs at highways	3		4	F.							12	60	7
		Railway crossing, 400 ft. signs	2		4	Ore							8	75	6
		Railway crossing signs at highways	4		4	Ore							16	60	10
		Nestoria to Houghton													
		Railway crossing signs at highways	20		4	F.& P.							80	60	48
		Nestoria to State Line													
		Railway crossing, 400 ft. signs	2		4	F.& P.							8	75	6
		Railway crossing signs at highways	32		4	F.& P.							128	60	77
			138												
Total Railroad Crossing Signs in Michigan							692		415	692		415	552		344

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allo.	1911			1912			1913		
				C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				$		$	$		$	$		$
MISCELLANEOUS SIGNS: 1,500 @ $1 (Miscellaneous signs, section numbers, Bridge Numbers, and minor Signs of all classes)	Miscellaneous Signs: 1,500 @ $1 (Bridge numbers and minor signs of all classes)	Miscellaneous Signs:		1,500	75	1,125	1,500	75	1,125			
		Sault Ste. Marie to Marquette										
		Yard limit signs 13 @ $2	F.& P.							26	80	21
		Section Numbers, Flanger Signs, Derail Signs and Minor Signs	F.& P.							150	75	112
		St. Ignace to Soo Junction										
		Yard limit signs 2 @ $2	F.& P.							4	80	3
		Section Numbers, Flanger Signs, Derail Signs and Minor Signs	F.& P.							50	75	38
		Marquette to Nestoria										
		Yard limit signs 10 @ $2	F.& P.							20	80	16
		Section Numbers, Flanger Signs, Derail Signs and Minor Signs	F.& P.							75	75	56
		Yard limit signs 2 @ $2	Ore							4	80	3
		Section Numbers, Flanger Signs, Derail Signs and Minor Signs	Ore							50	75	38
		Nestoria to Houghton										
		Yard limit signs 10 @ $2	F.& P.							20	80	16
		Section Numbers, Flanger Signs, Derail Signs and Minor Signs	F.& P.							70	75	52
		Nestoria to State Line										
		Yard limit signs 2 @ $2	F.& P.							4	80	3
		Section Numbers, Flanger Signs, Derail Signs and Minor Signs	F.& P.							100	75	75
Total Miscellaneous Signs in Michigan				1,500		1,125	1,500		1,125	573		433

RECAPITULATION CROSSINGS, CATTLE GUARDS and SIGNS

	1911		1912		1913	
	C. R.	P. V.	C. R.	P. V.	C. R.	P. V.
	$	$	$	$	$	$
Total Street and Highway Crossings	7,233	4,339	5,635	3,633	6,003	4,228
Total Overhead Crossings	1,000	600	1,000	600	1,000	600
Total Farm Crossings	700	420	700	420	1,150	690
Total Cattle Guards	6,500	4,818	4,800	4,320	5,380	4,596
Total Station Signs at Stations	180	162	180	162	322	290
Total Mile Posts	840	630	740	630	852	640
Total Whistle Posts	600	450	600	450	624	466
Total One Mile to Station Signs	224	157	224	157	452	316
Total Railroad Crossing Signs	692	415	692	415	552	344
Total Miscellaneous Signs	1,500	1,125	1,500	1,125	573	433
Total Crossings, Cattle Guards and Signs	19,469	13,116	16,171	11,912	16,908	12,603

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A		1911			1912			1913		
			Allocated	C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
INTERLOCKING MACHINES:				$		$	$		$	$		$
All of the protected crossings in Michigan were installed by the other company. The Duluth, South Shore and Atlantic Railway has no interest in any Interlocker in the State of Michigan.	Same.											
SIGNAL CABINS:												
All such structures owned by the Company are included under Schecule 28, Miscellaneous Buildings, as they have no machinery, and are merely houses for crossing flagmen stationed at crossings where no gates are installed.	Same.											
CROSSING GATES—HIGHWAY:												
None on the line in Michigan.	Same.											
CROSSING GATES—RAILROAD:												
Ishpeming—Gate at Crossing C. & N. W. Barnum Mine Spur.	Same.	Same.	Ore	25	60	15	25	60	15	25	60	15
Omitted.	Marquette—Approach to Spears' Coal Dock	Omitted	F.& P.				25	60	15			
SEMAPHORES—HAND OPERATED:												
Marquette Yard 3 semaphores @ $50.00	Same.	Same.	F.& P.	150	80	120	150	80	120	150	80	120
Ishpeming 1 semaphore 50.00	Same.	Same.	F.& P.	50	70	35	50	70	35	50	70	35
Kenton 1 semaphore 50.00	Same.	Same.	F.& P.	50	70	35	50	70	35	50	70	35
Negaunee 1 semaphore 50.00	Same.	Same.	F.& P.	50	70	35	50	70	35	50	70	35
1 cabin 50.00	Same.	Same.	F.& P.	50	70	35	50	70	35	50	70	35
ELECTRIC SIGNALS:												
Marquette Yard—Signal Installation (1907).	Same.	Same.	F.& P.	600	95	570	600	85	510	600	90	540
TRAIN STAFF BLOCK:												
Formerly used on line now double tracked; At present not installed but stored at Marquette; good condition—Material only.	Omitted.	Same as 1911.	F.& P.	875	80	700				875	80	700
	Total Freight and Passenger									1,825		1,500
	Total Ore									25		15
				1,850		1,545	1,000		800	1,850		1,515

Riggs—1911—Exhibit 1			Hansel 1912 Exhibit 15	Riggs—1913—Exhibit 1-A			1911 C.R.	1911 Apportioned to D.S.S. & A.	1911 %	1911 P.V.	1912 C.R.	1912 Apportioned to D.S.S. & A.	1912 %	1912 P.V.	1913 C.R.	1913 Apportioned to D.S.S. & A.	1913 %	1913 P.V.
TELEPHONE:				SAULT STE. MARIE TO MARQUETTE:			$	$		$	$	$		$	$	$		$
858 pounds of No. 12 wire @ 4c		34		Freight and Passenger														
2 sets of Kellogg's instruments @ $11.00		22		Telegraph pole line														
156 side brackets @ 6c		9		material	155.01 miles	@$136.08									21,094			
156 glass insulators @ 3c		5		labor	155.01 miles	95.70									14,834	14,834	70	10,358
Labor of Stringing wire, placing brackets, insulators and instruments		25	Same	Circuit No.														
				3 Telegraph wire line														
				iron wire	201.6 miles	25.60	95	95	70	67	95	95	70	67	5,161			
				labor	201.6 miles	9.57									1,929	1,929	70	1,350
				104 Telegraph wire line														
				iron wire	201.6 miles	25.60									5,161			
				labor	201.6 miles	9.57									1,929	1,929	70	1,350
POLE LINE TELEGRAPH:				109 Telegraph wire line			2,056				2,056							
From Marquette to Sand River				iron wire	46.6 miles	25.60	1,446	1,446	70	1,012	1,446	1,446	70	1,012	1,193			
15.11 miles	material @	$136.08	Same	labor	46.6 miles	9.57									446	446	70	312
15.11 miles	labor	95.70	Same				12,696				12,696							
From Sand River to Soo Junction				Total Freight and Passenger			8,929	8,929	70	6,250	8,929	8,929	70	6,250	51,747	19,138		13,396
93.3 miles	material	136.08	Same															
93.3 miles	labor	95.70	Same	Freight—None			6,341				6,341							
From Soo Junction to Sault Ste. Marie				Passenger—None			4,459	4,459	70	3,121	4,459	4,459	70	3,121				
46.6 miles	material	136.08	Same	Ore—None														
46.6 miles	labor	95.70	Same				5,838				5,838							
From Soo Junction to St. Ignace				Total Sault Ste. Marie to Marquette			4,105	4,105	70	2,874	4,105	4,105	70	2,874	51,747	19,138		13,396
42.9 miles	material	136.08	Same															
42.9 miles	labor	95.70	Same	ST. IGNACE TO SOO JUNCTION:			1,606				1,606							
From Marquette to Negaunee, north				Freight and Passenger			1,129	1,129	70	790	1,129	1,129	70	790				
11.8 miles	material	136.08	Same															
11.8 miles	labor	95.70	Same															

12.8 miles	labor	95.70	Same																
From Negaunee to Champion																			
18.9 miles	material	136.08	Same																
18.9 miles	labor	95.70	Same																
From Champion to Nestoria																			
15.2 miles	material	136.08	Same																
15.2 miles	labor	95.70																	
From Nestoria to State Line																			
101.5 miles	material	136.08	Same																
101.5 miles	labor	95.70	Same																
From Nestoria to Houghton																			
48.6 miles	material	136.08	Same																
48.6 miles	labor	95.70	Same																
From Bessemer Junction to Bessemer																			
1.9 miles	material	136.08	Same																
1.9 miles	labor	95.70	Same																
From Humboldt to Republic																			
8.5 miles	material	136.08	Same																
8.5 miles	labor	95.70	Same																
Total Pole Line																			
WIRE LINE TELEGRAPH:																			
Circuit No.																			
3 From Marquette to Sault Ste. Marie and St. Ignace																			
244.5 miles	iron wire @	$25.60	Same																
244.5 miles	labor	9.57	Same																
104 From Marquette to Sault Ste. Marie and St. Ignace																			
244.5 miles	iron wire	25.60	Same																
244.5 miles	labor	9.57	Same																
109 From Sault Ste. Marie to St. Ignace																			
89.5 miles	iron wire	25.60	Same																
89.5 miles	labor	9.57	Same																
5 From Marquette to State Line																			
152.2 miles	iron wire	25.60	Same																
152.2 miles	labor	9.57	Same																
129 From Marquette to Houghton																			
94.0 miles	iron wine	25.60	Same																
94.0 miles	labor	9.57	Same																
1,742																			
5,838																			
labor 42.9 miles		95.70	1,225	1,225	70	858	1,225	1,225	70	858	4,106	4,106	70	2,874					
Circuit No.																			
3 Telegraph wire line			2,572				2,572												
iron wire 42.9 miles		25.60	1,809	1,809	70	1,266	1,809	1,809	70	1,266	1,098								
labor 42.9 miles		9.57									411	411	70	288					
104 Telegraph wire line			2,068				2,068												
iron wire 42.9 miles		25.60	1,455	1,455	70	1,019	1,455	1,455	70	1,019	1,098								
labor 42.9 miles		9.57									411	411	70	288					
109 Telegraph wire line			13,812				13,812												
iron wire 42.9 miles		25.60	9,713	9,713	70	6,779	9,713	9,713	70	6,799	1,098								
labor 42.9 miles		9.57									411	411	70	288					
Total Freight and Passenger			6,613				6,613				14,471	5,339		3,738					
			4,651	4,651	70	3,256	4,651	4,651	70	3,256									
Freight—None																			
Passenger—None			259				259												
Ore—None			182	182	70	127	182	182	70	127									
Total St. Ignace to Soo Junction			1,157				1,157				14,471	5,339		3,738					
Total Sault Ste. Marie to Marquette			813	813	70	569	813	813	70	569	51,747	19,138		13,396					
Total East of Marquette			96,676	39,916		27,941	96,676	39,916		27,941	66,218	24,477		17,134					
MARQUETTE TO NESTORIA:																			
Freight and Passenger																			
Telegraph Pole Line																			
material 62.9 miles	@	$136.08	6,259				6,259				8,559								
labor 62.9 miles		95.70	2,340	2,340	70	1,638	2,340	2,340	70	1,638	6,020	6,020	70	4,214					
Circuit No.																			
5 Telegraph wire line			6,259				6,259												
iron wire 46.0 miles		25.60	2,340	2,340	70	1,638	2,340	2,340	70	1,638	1,178								
labor 46.0 miles		9.57									440	440	70	308					
129 Telegraph wire line			2,291				2,291												
iron wire 46.0 miles		25.60	856	856	70	599	856	856	70	599	1,178								
labor 46.0 miles		9.57									440	440	70	308					
128 Telegraph wire line			3,896				3,896												
iron wire 11.8 miles		25.60	1,457	1,457	70	1,020	1,457	1,457	70	1,020	302								
labor 11.8 miles		9.57									113	113	70	79					
102 Telegraph wire line			2,406				2,406												
iron wire 38.2 miles		25.60	900	900	70	630	900	900	70	630	978								

Riggs—1911—Exhibit 1				Hansel 1912 Exhibit 15	Riggs—1913—Exhibit 1—A			1911 C.R.	1911 Apportioned to D.S.S. & A.	1911 %	1911 P.V.	1912 C.R.	1912 Apportioned to D.S.S. & A.	1912 %	1912 P.V.	1913 C.R.	1913 Apportioned to D.S.S. & A.	1913 %	1913 P.V.
								$	$		$	$	$		$	$	$		$
128	From Marquette to Negaunee					labor	38.2 miles 9.57									366	366	70	256
	11.8 miles	iron wire	25.60	Same	127	Telegraph wire line		302				302							
	11.8 miles	labor	9.57	Same		iron wire	30.7 miles 25.60	113	113	70	79	113	113	70	79	786			
102	From Marquette to S. Ishpeming and Houghton					labor	30.7 miles 9.57									294	294	70	206
	95.0 miles	iron wire	25.60	Same	274	Telegraph wire line		2,432				2,432							
	95.0 miles	labor	9.57	Same		iron wire	46.0 miles 25.60	909	909	70	636	909	909	70	636	1,178			
127	From Marquette to Champion					labor	46.0 miles 9.57									440	440	70	308
	30.7 miles	iron wire	25.60	Same	1	Telegraph wire line		786				786							
	30.7 miles	labor	9.57	Same		iron wire	65.0 miles 25.60	294	294	70	206	294	294	70	206	1,674			
274	From Marquette to Houghton					labor	65.0 miles 9.57									622	622	70	435
	94.0 miles	copper wire	85.10	Same	131	Telegraph wire line		7,999				7,999							
	94.0 miles	labor	9.57	Same		iron wire	11.8 miles 25.60	900	900	70	630	900	900	70	630	302			
1	From Marquette to Republic and Houghton					labor	11.8 miles 9.57									113	113	70	79
	113 miles	iron wire	25.60	Same	204	Telegraph wire line		2,893				2,893							
	113 miles	labor	9.57	Same		iron wire	20.3 miles 25.60	1,081	1,081	70	757	1,081	1,081	70	757	520			
131	From Marquette to Negaunee					labor	20.3 miles 9.57									194	194	70	136
	11.8 miles	iron wire	25.60	Same	152	Telegraph wire line		302				302							
	11.8 miles	labor	9.57	Same		iron wire	46.0 miles 25.60	113	113	70	79	113	113	70	79	1,178			
204S	From Marquette to Negaunee					labor	46.0 miles 9.57									440	440	70	308
	11.8 miles	iron wire	25.60	Same				302				302							
	11.8 miles	labor	9.57	Same		Telephone		113	113	70	79	113	113	70	79				
152	From Marquette to State Line					858 lbs. of No. 12 wire @ 4c	34												
	147.4 miles	iron wire	25.60	Same		2 sets of Kellogg instruments @ $11	22	3,773				3,773							
	147.4 miles	labor	9.57	Same	156	side brackets @ 6c	9	1,411	1,411	70	988	1,411	1,411	70	988				
204N	From Marquette to Negaunee					156 glass insulators @ 3c	5												
	11.8 miles	iron wire	25.60	Same		Labor of stringing wire, placing insulators and instruments	52 25	302 113	113	70	79	302 113	113	70	79				

Total Wire Line													95	95	70	67
Total Freight and Passenger				53,142	12,940		9,058	53,142	12,940		9,058		27 410	9,577		6,704
Freight—None																
Passenger—None																
Ore																
Telegraph Pole Line																
material	4.3 miles	136.08											585			
labor	4.3 miles	95.70											412	412	70	288
Circuit No.																
102 Telegraph wire line																
iron wire	8.8 miles	25.60											225			
labor	8.8 miles	9.57											84	84	70	59
204 Telegraph wire line																
iron wire	4.3 miles	25.60											110			
labor	4.3 miles	9.57											41	41	70	29
Total Ore													1,457	537		376
Total Freight and Passenger													27,410	9,577		6,704
Total Marquette to Nestoria													28,867	10,114		7,080
NESTORIA TO HOUGHTON																
Freight and Passenger																
Telegraph pole line																
material	48.6 miles	@ $136.08											6,613			
labor	48.6 miles	95.70											4,651	4,651	70	3,256
Circuit No.																
129 Telegraph wire line																
iron wire	48.0 miles	25.60											1,229			
labor	48.0 miles	9.57											459	459	70	321
102 Telegraph wire line																
iron wire	48.0 miles	25.60											1,229			
labor	48.0 miles	9.57											459	459	70	321
274 Telegraph wire line																
iron wire	48.0 miles	25.60											1,229			
labor	48.0 miles	9.57											459	459	70	321
1 Telegraph wire line																
iron wire	48.0 miles	25.60											1,229			
labor	48.0 miles	9.57											459	450	70	321
Total Freight and Passenger													18,016	6,487		4,540

Riggs—1911—Exhibit 1	Hansel 1912 Exhibit 15	Riggs—1911—Exhibit 1	1911 C.R.	1911 Apportioned to D.S.S. & A.	1911 %	1911 P.V.	1912 C.R.	1912 Apportioned to D.S.S. & A.	1912 %	1912 P.V.	1913 C.R.	1913 Apportioned to D.S.S. & A.	1913 %	1913 P.V.
				$		$	$	$		$	$	$		$
		Freight—None												
		Passenger—None												
		Ore—None												
		Total Nestoria to Houghton									18,016	6,487		4,540
		Total Marquette to Nestoria									28,867	10,114		7,080
		Total Marquette to Houghton									46,883	16,601		11,620
		NESTORIA TO STATE LINE:												
		Freight and Passenger												
		Telegraph pole line												
		material 101.5 miles @ $136.05									13,812			
		labor 101.5 miles 95.70									9,714	9,714	70	6,800
		Circuit No.												
		5 Telegraph wire line												
		material 104.3 miles 25.60									2,670			
		labor 104.3 miles 9.57									998	998	70	699
		152 Telegraph wire line												
		material 101.4 miles 25.60									2,596			
		labor 101.4 miles 9.57									970	970	70	679
		Total Freight and Passenger									30,760	11,682		8,178
		Freight—Bessemer Branch												
		Telegraph pole line												
		material 1.9 miles $136.08									259			
		labor 1.9 miles 95.70									182	182	70	127

		Circuit No. 5 Telegraph wire line												
		iron wire	1.9 miles	25.60								49		
		labor	1.9 miles	9.57								18	18 70	13
		Total Freight										508	200	140
		Total Freight and Passenger										30,760	11,628	8,178
		Total Nestoria to State Line										31,268	11,882	8,318
RECAPITULATION:														
Total in Michigan					52,951	37,066		52,951	37,066			52,960		37,072

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS

Schedule No. 16
SIDE TRACKS

Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913			
				F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
	All side tracks are constructed of 56 lb rail except as noted.			These columns show the length of Side Tracks in Feet									
	SAULT STE. MARIE TO MARQUETTE												
0.00	SAULT STE. MARIE:	Tracks owned jointly with Soo Line	Tracks owned jointly with Soo Line										
	Omitted	Tannery scale track 1,250′	663′		192			625			332		
	Tannery scale track dead rails	190′	190′		1,020			95			95		
	Tannery track No. 1	1,052′	1,052′		1,689			526			526		
	Tannery track No. 2	903′	903′		904			452			452		
	Tannery track No. 3	762′	762′		734			381			381		
	Tannery track No. 4	805′	805′		715			403			402		
	Tannery track No. 5	633′	633′		575			317			316		
	Siding No. 7	Tannery track No. 6 564′	564′		400			282			282		
	Crossover track	353′	Crossover No. 2 to No. 3 353′					177			176		
	Omitted	No. 1 transfer spur 1,626′	No. 1 transfer spur 1,626′					813			813		
	Omitted	Scale track on No. 1 transfer dead rail 180′	180′					90			90		
	Omitted	No. 2 transfer spur 1,544′	1,544′					772			772		
	Omitted	No. 3 transfer spur 863′	863′					432			432		
	Omitted	House track N. side 1,419′	1,419′					710			710		
	Crossover to No. 2 transfer 200′	199′	199′		100			100			100		
		House track S. side 453′	Extended 1912 1,010′					227			505		
	Omitted	Omitted	Platform spur 206′								103		
	Spur track S. of transfer house 1,600′	695′	695′		800			348			348		
	Old carbide spur 500′	Snow plow spur 456′	Same as 1912 456′		250		228			228			
			ROUND HOUSE YARD:										
	Round house main track 625′	1,664′	670′	313			832			335			
	Built 1913		Out bound engine track 400′							200			
	Built May, 1912		Coal and supply spur 375′							187			

Track in round house	1,440′		1,441′	Engine house tracks, turntable to house	1,380′	720			721			660							
Built May, 1912				Depressed track	367′							184							
Built May, 1912				Supply spur	382′							191							
First siding E. of main line	1,100′		1,198′	Freight track No. 1	1,198′	550				599			599						
Second siding E. of main line	900′		900′	Freight track No. 2	900′	450				450			450						
Flour mill spur	770′		1,165′		1,165′		385			583			582						
		Connection with Mich.-L. S. Power Co. track	783′		783′					392			392						
Included below in W. P. spur		Track on water power canal bank	200′	Water power canal fill spur	1,175′		1,468			100		588							
Spur on water power canal fill	2,975′	Cullen Friestedt Co. spur	575′	25′ taken up 1913	500′					288			250						
Built 1912		Siding No. 1 So.	2,078′	Storage track S. of Main No. 1	2,560′		1,020			1,039			1,280						
Extended 490′—1912	2,040′			Storage track south of main No. 2	2,333′		912			922			1,166						
		Siding No. 2 south	1,843′	Storage track south of main No. 3	2,111′		800			811			1,056						
Extended 490′—1912	1,824′			Storage track south of main No. 4	2,379′		687			695			1,190						
		Siding No. 3 south	1,621′	Storage track south of main No. 5	2,100′								1,050						
Extended 490′—1912	1,599′				184′		84		92				92						
		Siding No. 4 south	1,389′	East crossover	207′	149			104				104						
Extended 490′—1912	1,374′				1,432′		875			716			716						
					1,109′		800			555			554						
Built 1912					1,481′		625			741			740						
West crossover	168′		184′		2,405′		450			1,203			1,202						
Crossover	297′		207′	Repair track	350′								175						
Freight track No. 1 E	1,750′	Track No. 1 north	1,432′	Omitted						360									
Freight track No. 2	1,600′	Track No. 2 north	1,109′	Peninsula Bark & Lumber Co. Branch	0.43 mi.														
Freight track No. 3	1,250′	Track No. 3 north	1,481′		1,422′		1,085			711			711						
Freight track No. 4	900′	Track No. 4 north	2,405′		872′		925			436			436						
Built 1912																			
Omitted		Track No. 5 north	720′	Port Royal coal dock spur	2,450′		1,900			977			1,225						
				Dock spur No. 1	482′					416			241						
Kelly Mayer mill spur			1,422′																
American Brick Co. spur			872′		647′		511			234			323						
Bradley Watkins mill (extended 500′—1912)			1,954′		1,073′		1,862			537			536						
Omitted		350′ taken up 1912	832′		1,788′		1,050			894			894						
Peninsula Bark & Lumber log spur			647′		856′		762		428						428				
No. 1			1,073																
No. 2			1,788′																
East leg of "Y"	1,524′		856′																

Mile Post	Riggs—1911—Exhibit 1		Hansel—1912—Exhibit 15		Riggs—1913—Exhibit 1-A		1911			1912			1913			
							F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
							These columns show the length of Side Tracks in Feet									
	West leg of "Y"	858'		852'		852'		429		426					426	
	Included in East leg of "Y"		Tail track	660'		660'				330					330	
	Crossover—main line to double track	212'				211'		106			106		105			
	Pearry track		Dock spur	701'	Taken up Oct., 1912			705			351					
	Log spur		Taken up 1912					403								
	Built 1912, belongs to Union Depot Co.		Pintsch gas spur	290'	Included in "Terminals"							145				
	Coal shed	600'	Coaling track	512'	Taken up 1913		300			256						
	Coal shed, west	1,450'			Taken up 1913		725									
	Coal shed, top	886'		904'	Taken up 1913		443			452						
	Spur to tank	225'		300'	Taken up 1913		112			150						
	Great Lakes Dredge Co. spur	525'	Taken up Dec., 1911					262								
	Spur S of freight house	500'	Taken up 1912					250								
	Spur S of ice house	616'	Taken up 1912					308								
	Siding No. of transfer	1,275'	Omitted		Omitted			637								
	N. siding	1,464'	Omitted		Omitted			732								
	Siding S of above	1,878'	Omitted		Omitted			939								
	Cera Vita Mill	700'	Owned by Mich.-L. S. Power Co. owned by the D., S. S. & A. R'y		and not now shown in side track Co.			350								
	Spur W of freight house	1,000'	Omitted		Omitted			500								
	Omitted		Tank crossover	300'	Omitted					150						
	Omitted		Turntable spur	260'	Omitted					130						
2.5	Built June, 1913				Ferguson spur									264		
8.0	Gladys spur							370			370			370		
12.4	Brimley															
	Bay Mills branch		3,060' taken up Jan., 1913		Frt. 1.22 mi.			7,576								
	Passing track						1,983			1,983			1,983			
	Built Dec., 1912		Siding on Bay Mills branch								1,350			1,350		
	Built Nov., 1911		Warehouse track								520			520		
14.6	Dorgan's Spur							535			535			530		
16.4	Built May, 1913				Johnsonburg spur									406		
17.3	Elbon spur							527			527			527		

18.8	Wellsburg—passing track				1,622		1,622			1,622			
20.1	Doranson lumber branch siding	Taken up May, 1912			473								
21.2	Wellers siding	Taken up—May, 1911			1,539								
	Relaid		Wellers spur								550		
25.0	Rexford			1,770			1,770			1,770			
	Passing track				367			367		367			
	Cinder spur		60 lb rail—extended 92'—June, '13		420			420			512		
26.5	La Main spur—60 lb				1,193								
31.8	Strongs		60 lb rail	1,006			1,006			1,487			
	Spur on old Perry branch	Now part of Fuller branch						726			726		
	Passing track				700			700			700		
	Built Nov., 1911	Horton's mill						1,297			1,206		
	Spur	Shingle spur	Included under branches—extended to 2.2 mi. Dec., 1912					7,530					
	Built Sept., 1912	Fuller's mill spur No. 1						497			497		
	Built Sept., 1912	Fuller's mill spur No. 2			645								
	Built Sept., 1912	Loading track			1,100			1,100			1,100		
32.5	Boxer spur	Taken up in July, 1911		2,057			2,057			2,057			
35.4	Eckerman spur							890			890		
	Passing track		Lyonton spur								490		
36.0	Built Sept., 1911	Noble's log spur	Seewhy branch frt. 0.87 mi.					1,545					
37.0	Built Oct., 1912		Seewhy branch spur								565		
38.4	Built Sept., 1911—extended Dec. 1911	Seewhy spur											
	Buil t Nov., 1912				857			857			857		
41.0	Hurlburt			1,487			1,487			1,487			
	Old mill spur		Natpo spur								960		
	Passing track—60 lb			1,185			1,185					1,185	
44.6	Built Sept., 1912—extended Feb., 1913			254			254			254			
46.6	Soo Junction			150			150			150			
	"Y" track			150			150			150			
	Round house spur			2,152				2,152		2,150			
	No. 1 stall			1,880				1,880			1,880		
	No. 2 stall			1,396				1,396			1,396		
	Passing track			1,478				1,478			1,478		
	First siding N. of main line				521			521		521			
	2nd siding N. of main line				190			190			190		
	New siding				607								
	Lumber yard		Taken up—1913		200		200						
	Scales												
	O'Grady's spur	Taken up—1912											
	Depot spur												

Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913			
				F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
				These columns show the length of Side Tracks in Feet									
	New coal bin spur				350		350			350			
			4.82 mi. frt. This branch now operated by Lumber Co. altho track is owned by South Shore										
	Built Sept., 1911	Hunter's branch											
	Built Sept., 1911	Hunter's loading spur						525			525		
	Built Sept., 1911	Mill track No. 1						1,100			1,100		
	Built Sept., 1911	Mill track No. 2						1,090			1,090		
49.5	Sage—passing track			1,899			1,899			1,899			
54.0	Peroid spur		Taken up, Nov., 1912		599			599					
54.9	McPhee spur				890			890			890		
55.5	Lencel spur				1,185			1,185			1,185		
58.5	Newberry												
	Siding No. 1 south			1,358				2,538			2,538		
	Siding No. 1 north		Extended August, 1912	2,157			2,407			2,407			
	Siding No. 2				1,290			1,290			1,290		
	Siding at Asylum				470			470			470		
		Asylum branch	2.37 mi. fr't.										
	Built Aug., 1912	Yard siding No. 3 north						730			730		
	Built May, 1912	Pig iron track						355			355		
60.3	Dollarville												
	North siding	Taken up 1912		3,318									
	South siding—error in length	Passing track		2,062			1,092			1,092			
	Lumber yard	Mill spur—partly taken up—1912			1,250			566			566		
	Log track	Trestle spur—partly taken up, '12			2,395			810			810		
	Lumber siding 2	Connected with another track called one			1,100			3,850			3,850		
	Lumber siding 4				1,501			1,501			1,501		
64.6	Murner Cedar spur		Taken up—May, 1913		1,750			1,750					
	Spurs on above		Taken up—May, 1913		595			595					
67.3	McMillan—Passing track			1,433			1,433			1,433			
	Mill spur				1,621			1,626			1,626		
	Log track				1,100			1,125			1,125		
		Danaher branch	6.38 mi. frt.										

	Built Dec., 1912	Northern Cooperage Branch	2.00 mi. frt.								
	Built Dec. 1912		King Lumber Co. mill spur No. 1							1,256	
70.2	Laketon siding		King Lumber Co. mill spur No. 2							1,045	
71.8	Danaher—passing track			1,109		1,109		1,109			
75.4	Built Nov., 1911—extended July, 1912 and Nov., 1912	Danaher branch	Frt.—2.97 mi.	2,017		2,017		2,017			
	Built Nov., 1911—extended May, 1912	Spur No. 1									
	Built Nov., 1911	Spur No. 2					824		821		
79.6	Seney						500		500		
	No. 1 siding north			1,890		1,800		1 800,			
	No. 1 siding south			1,609			1,229		1,229		
	Coal trestle			883		1,038		1,038			
	No. 2 siding north				895		913		913		
80.4	Built Nov., 1911	New Seney spur					700		700		
88.0	Dreggs—passing track			1,811		1,811		1,811			
90.6	Built Nov.., 1912		Walsh spur						580		
92.7	Built June, 1912—extended Nov. 1912	Ducy spur					440		720		
95.2	Creighton—passing spur			1,975		1,975		1,975			
	Log spur		Taken up—Nov., 1912		1,216		1,175				
95.6	Agnes log spur—60 lb		Taken up—Nov., 1912		750		750				
98.9	Clement spur	Taken up—Nov., 1911			855						
101.0	Star siding				495		495		495		
104.5	Shingleton siding			1,498		1,400		1,400			
	W. connection M., M. & N. R'y	Taken up—Nov., 1912			65						
	E. connection M., M. & N. R'y	Siding depot—extended 1912			415	1,180			1,180		
	Log spur				677		677		677		
107.4	Evelyn—"Y" conn. east leg				1,020		1,020		1,020		
	"Y" conn. west leg				1,160		1,160		1,160		
108.5	Passing track			1,583		1,583		1,583			
	Built Jan., 1912	Spur on Evelyn passing track	Connected with Munising R'y				585		500		
111.5	Connors spur	Taken up—Aug., 1912			729		98				
112.5	Wetmore passing track			1,832		1,833		1,833			
	Built Nov., 1911	Potato warehouse					415		450		
116.7	Munising Junction "Y" connection 60 lb		60 lb rail		822	822		822			
	Siding—60 lb		60 lb rail		495		495		495		
117.9	Rice log spur—60 lb	Taken up July, 1911			500						

Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913			
				F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
				These columns show the length of Side Tracks in Feet									
119.5	Ridge—passing track			1,710			1,710			1,710			
120.5	Underwood spur				411			411			411		
121.7	Built Oct., 1911	Williamson spur						260			260		
123.1	Wilcox spur				852			852			852		
125.0	Au Train—passing track			1,311			1,311			1,311			
	Spur to river	Taken up Oct., 1911			576								
	Spur west end of siding				366			366			366		
	New Sand pit—60 lb		60 lb rail		700			700			700		
127.4	Brownstone main track—60 lb	Taken up July, 1911			2,800								
	Brownstone mill spur—60 lb	Taken up July, 1912			386								
129.3	Rock River passing track			1,111			1,111			1,111			
	Log spur				474			474			474		
133.6	Onota siding				733			733			733		
	Track to kilns	Removed in 1912			493								
135.6	Deerton—passing track			1,212			1,212			1,212			
137.6	Whitefish log spur				467			633			633		
139.9	Sand River												
	Passing track			1,426			1,426			1,426			
	Coal trestle			1,051			1,061			1,061			
	"Y" track, east leg				1,200			1,200			1,200		
	"Y" track, west leg		Extended Jan., 1913		1,400			1,400			1,804		
	Timber spur				840			840			840		
142.4	Dorais log spur				404			404			404		
142.9	Built July, 1912	Sambrook						459			459		
145.0	Gordon—passing track			1,544			1,544			1,544			
	Spur				344			344			344		
147.3	Goodman's spur	Taken up June, 1912			378								
150.6	Chocolay passing track			1,459			1,459			1,459			
151.0	Chocolay furnace												
	Pig iron track				2,021			2,276			2,021		
	Engine house spur				225			225			225		
	Charcoal kiln house		Taken up May, 1913		1,442			1,442					
	Empty car siding		Taken up Nov., 1911		1,380								

	Ore track			564' taken up Dec., 1912			1,954			1,954			1,390			
	Ore trestle, N. side			Taken up Dec., 1912			458			458						
	Ore trestle, S. side			Taken up Dec., 1912			458			458						
	Charcoal track						131			131			131			
	East end side track						87			87			87			
	Empty car siding						668			668			668			
151.3	Gillette spur						1,135			1,135			1,135			
152.6	Marquette State Prison joint with M & S. E.															
	Main track	1,968'	1,968'		1,968'		984			984			984			
	Crossover	259'	259'		259'		129			129			129			
	Lumber siding	445'	445'		445'		222			222			222			
	Spur inside wall	144'	144'	Taken up Sept., 1912			72			72						
153.5	Carp Furnace, joint with M.& S. E.															
	Kiln east of river	1,256'	1,256'		1,256'		628			628			628			
	New kiln	390'	390'		390'		195			195			195			
	Crossover	231'	232'		232'		116			116			116			
	Main track in shed	1,235'	1,235'		1,235'		618			618			618			
	North track in shed	505'	505'		505'		253			253			253			
	South track in shed	505'	505'		505'		253			253			253			
	Crossover to M. & S. E.	291'	291'		291'		146			146			146			
	Spur to Carp river	1,544'	1,544'		1,544'		772			772			772			
	Spur track to furnace	827'	827'		827'		414			414			414			
	Total length of side track—		56 lb rail—owned and exclusively	used by D., S. S. & A.		54,729	72,212	0				45,092	64,786	1,185		
	Total length of side track—		56 lb rail—apportioned to D., S. S.	& A. and jointly used		3,762	19,353	0	No weights given			2,708	27,529	1,184		
	Total length of side track—		60 lb rail—owned and exclusively	used by D., S. S. & A.		1,487	6,873	0				2,309	1,707	0		
	Total Sault Ste. Marie to Marquette					59,978	102438	0	50,746	104587	145	50,109	94,022	2,369		
	ST. IGNACE TO SOO JUNCTION:															
0.0	St. Ignace:															
	Martel furnace						1,206			1,206			1,206			
	Meat warehouse spur						315			315			315			
	Lake Shore central track						1,582			1,582			1,582			
	Lake Shore east track						1,486			1,486			1,486			
	Lake Shore west track						1,356			1,356			1,356			
	Spur near depot						414			414			414			
	Spur S. side shed						750			750			750			
	Spur S. side above						530			530			530			
	Spur N. of dock						580			580			580			

Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913			
				F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
				These columns show the length of Side Tracks in Feet									
	Spur lumber dock		450′ taken up Sept., 1912		570			570			120		
	Siding north side		Extended 300′—Nov., 1912		762		762			1,062			
	Crossover				173		173			173			
	Spur South side				397		397			397			
	Main spur				1,632			1,632			1,632		
	Siding S. side				1,189			1,189			1,189		
	Crossover				131			131			131		
	Siding E. of coal shed				1,579			1,579			1,579		
	Siding E. of above				1,118			1,118			1,118		
	Scale siding				1,353			1,353			1,353		
	Mackinaw Lumber Co. spur				2,960			2,960			2,960		
	Spur E. of main line				1,075			1,075			1,075		
	Main track in gravel pit				1,619			1,619		1,619			
	Machine track				1,241			1,241		1,241			
	Loose track				419			419		419			
	Spur in pit	Omitted	Cedar yard spur		715						1,000		
			Spur to Jones & Kerry mill—extended 2,000′—Dec., 1912										
	Spur on sawmill branch				281			281			2,281		
	Main track on dock			1,550				1,550			1,550		
	Spur to turntable			540			540			540			
	Round house track			530			530			530			
	Siding west of coal shed			1,000			1,000			1,000			
	Coal shed track			819			819			819			
	1st siding W. of main line			1,661				1,661			1,661		
	Crossover north			171				171			171		
	Crossover south			173				173			173		
	1st siding E. of main line			2,113				2,113			2,113		
	Built Dec., 1912		Spur on Jones & Kerry mill track								275		
	Built 1913		Temporary "Y" track							705			
4.0	Reavie—Duck yard siding—60 lb	Brick yard siding	Passing track —60 lb		1,586			1,586		1,586			
7.0	Rugsten—Spur—60 lb		Passing track—60 lb rail		768			768			768		
7.8	Nero spur	Extended Dec., 1912			1,110			1,110			1,470		
10.1	Allenville siding			960			960			960			

11.1	Moran—passing track					1,803		1,803		1,803	
	Spur		Extended Nov., 1911			2,576		5,426		5,426	
	No. 2 mill spur					868		868		868	
	Built Nov., 1911	No. 1 mill spur—loading spur						460		460	
14.3	Green spur					600		600		600	
	Built Nov., 1912		Gillies spur							743	
15.4	Built July, 1911	Berst's spur						368		368	
16.6	Nogi—mill spur					1,150		1,150		1,150	
	Passing track—60 lb		60 lb rail			761		761	761		
	Spur to river—60 lb		60 lb rail			664		664		664	
		Old track taken up, relaid and extended, 1912				831		1,080		1,080	
17.5	Bissell river spur			2,000			2,000		2,000		
19.6	Kenneth—passing track					590		590		590	
	Mill spur					544		544		544	
20.8	Murray spur					1,677		1,806		1,806	
23.1	Ozark spur to mills	Extended Nov., 1912				555		555		841	
	Bark spur		Extended Jan., 1912			1,025		1,025		1,025	
	Log spur at mine					1,030		1,030		1,030	
	Book & Grover mill					971		971		971	
25.4	Dell spur			1,190			1,190		1,190		
27.7	Trout Lake—passing track No. 1			1,689				1,689	1,689		
	Passing track No. 2					288		288		288	
	E. side of south "Y"					1,975		1,975		1,975	
	E. leg E. "Y"		60 lb rail			1,865		1,865		1,865	
	W. leg E. "Y"—60 lb		60 lb rail			452		452		452	
	North "Y" conn.—60 lb					1,420		1,420		1,420	
	Mill spur							228		228	
	Built 1913	Lumber spur on mill spur				1,122		1,122		1,122	
31.4	Cana spur		60 lb rail			296		296		296	
32.2	Cheesborough spur—60 lb					2,380					
	North branch—60 lb	Taken up Dec., 1911						782		782	
32.3	Built Nov., 1911	Kemp spur		1,844				1,844	1,844		
33.7	Fiborn Junction—passing track		Fiborn Quarry branch		40.1 mi. frt.						
	Siding at quarry	Old main track (under bins)				1,425		2,150		2,150	
	Spur to engine house					635		635		635	
	Spur to open pit	Now part of main line				1,955					
	Spur to new crusher	Crusher track				445		1,110		1,110	
	Spur on above	Taken up				320					
	New pocket in pit					720		720		720	
	Screening track in pit					395		395		395	

Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913			
				F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
				These columns show the length of Side Tracks in Feet									
	Built Nov., 1911	Log spur at quarry	Extended Nov., 1912					560			796		
	Built Oct., 1911	Crusher supply track						1,070			1,070		
	Built Sept., 1912		Foster spur								800		
34.3	Quinn spur				1,287			1,287			1,287		
36.5	Hendrie—passing track			1,781			1,781			1,781			
	Spur	Extended Sept., 1911			320			953			953		
40.1	Peshins log spur—60 lb		60 lb rail		310			310			310		
	Built June, 1912	South spur						898			898		
	Total length of side track—	56 lb rail—owned and exclusively	used by D., S. S. & A.	18,021	53,140	0				19,772	64,271	0	
	Total length of sidetrack —	56 lb rail—apportioned to D., S. S.	& A. and jointly used	0	0	0	No weights given			0	0	0	
	Total length of side track—	60 lb rail—owned and exclusively	used by D., S. S. & A.	0	9,082	0				2,347	4,355	0	
	Total St. Ignace to Soo	Junction		18,021	62,222	0	11,955	72,525	0	22,119	68,626	0	
	Total Sault Ste. Marie	to Marquette		59,978	102,438	0	50,746	104,587	145	50,109	94,022	2,369	
	Total East of Marquette			77,999	164,660	0	62,701	177,112	145	72,228	162,648	2,369	
	MARQUETTE TO NESTORIA:												
153.0	MARQUETTE:												
	SCHOOL HOUSE YARD												
	M. & W. "Y"		(Ore and freight)		1,584		1,584			1,584			
	School house siding No. 1		(Ore and freight)		985			985			985		
	School house siding No. 2		(Ore and freight)		634			634			634		
	School house siding No. 3		(Ore and freight)		737			737			737		
	School house siding No. 4		(Ore and freight)		821			821			821		
	School house siding No. 5		(Ore and freight)		1,031			1,031			1,031		
	School house siding No. 6		(Ore and freight)		728			728			728		
		Quarry branch	0.27 mi. frt.										
	Spur west of mill at quarry				675			675			675		
	Spur to pit				486			486			486		
	Loading spur				276			276			276		
	Gas house coal spur				389			389			389		

LOWER FREIGHT YARD:												
Freight yard	Standard Oil spur	Same as 1912		244			244			244		
Standard Oil spur	Siding No. 1	East freight spur No. 1		701			701			701		
East freight spur	Siding No. 2	East freight spur No. 2		417			417			417		
1st track west of freight house	Siding No. 3	Same as 1911		1,250			1,250			1,250		
2nd track west of freight house	Siding No. 4	Same as 1911		780			680			780		
3rd track west of freight house	Siding No. 5	Same as 1911		975			975			975		
Stub track No. 1	Siding No. 6	Same as 1911		850			850			850		
Stub track No. 2	Siding No. 7	Same as 1911		710			710			710		
Stub track No. 3	Siding No. 8	Same as 1911		610			610			610		
Engine house lead				460		460			460			
Engine house tracks				700		700			700			
Cinder pit track				185		185			185			
Old car shed, east side				427			427		427			
Old car shed, west side				412			412		412			
LOWER YARD												
Sambrook's mill spur				674			674			674		
1st track west of main line	Ely yard No. 1	Same as 1911		1,230			1,230					1,230
2nd track west of main line	No. 2	Same as 1911		1,230			1,430					1,430
3rd track west of main line	No. 3	Same as 1911		1,630			1,630					1,630
4th track west of main line	No. 4	Same as 1911		1,410			1,469					1,410
Stub track on above	No. 5	Same as 1911		320			1,172					320
Stub track west of above	No. 6	Same as 1911		450			1,263					450
Ely yard track No. 6	Car repair track No. 1	Same as 1911		873			893					873
West track from diamond crossing to engine house	Omitted			2,150								2,150
Spur at west end of above track	Omitted			575								575
Car wheel spur	Car repair track No. 2			460			454					460
Lake St. branch connection				348			348			348		
M. & S. E. crossover at gas house	Omitted			75						75		
Lake Street siding No. 1	Lake St. branch	1.12 mi.		1,104			1,104			1,104		
Built Oct., 1911							977			977		
Built May, 1913	Lake Street siding No. 2									781		
Lake Street round house		Lake Street siding No. 3		185								
Omitted	Taken up—1911						110					
	Crossover	Omitted										
COAL DOCKS												
Main track Pickand's dock				1,507			1,507			1,507		
Diamond crossing in Lake St. to end of Spear's dock				1,292			1,292			1,292		

Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913			
				F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
				These columns show the length of Side Tracks in Feet									
	Connection with Lake St. branch				392			392			392		
	Diamond crossing to connection with dock track				247			367			247		
	Stub track under dock	Spur near bulkhead	Same as 1911		735			600			735		
	Spur next to coal shed				774			774			774		
	Spur to mdse. dock	Omitted			944						944		
	Spur next to warehouse				485			370			485		
	Spur on Spears' dock		Taken up Sept., 1912		572			115					
	Spur to old dock	Taken up, 1912			181								
	Spur on Spear's coal dock				435			435			435		
	Jt. crossover M. & S. E. R. R. 131′	Jt. crossover L. S. & I. 130′	Crossover to M. & S. E.		66			65			65		
	Jt. crossover M. & S. E. R. R. 149′	Jt. crossover near L. S. & I. depot 150′	Crossover near M. & S. E. depot		74			75			75		
	DEPOT YARD												
	Crossover between main tracks	Omitted				180			180			180	
	Head track to station					820			820			820	
	Crossover at station					166			166			166	
	Coach track No. 1 S					710			710			710	
	Coach track No. 2 S					710			710			710	
	Coach track No. 3 S					550			550			550	
	N. spur W. of depot				490				490			490	
	S. spur W. of depot				350				350			350	
	ORE DOCKS:												
	Approach to 1st switch—70 lb rail	Approach to No. 5 ore docks	70 lb rail—Same as 1912		1,181			1,181					1,181
	North side pockets No. 1—70 lb rail		70 lb rail		1,331			1,331					1,331
	North side pockets No. 2—70 lb rail		70 lb rail		1,331			1,331					1,331
	South side pockets No. 1—70 lb rail		70 lb rail		1,331			1,331					1,331
	South side pockets No. 2—70 lb rail		70 lb rail		1,331			1,331					1,331
	Track in cut to Diamond crossing in Lake st.—60 lb		60 lb rail		1,330			1,330			1,330		
	Siding on above				770			420			770		

Crossover at Harlow's—60 lb rail			120					120			
N. track to end of No. 4 dock—60 lb rail		60 lb rail	165		165			165			
S. track to end of No. 4 dock—60 lb rail		60 lb rail	3,560			3,560					3,560
N. freight spur No. 4 dock—60 lb rail		60 lb rail	3,080			3,080					3,080
		New freight house—south track—60 lb rail	480			320		320			
S. freight spur No. 4 dock, 60 lb rail		New freight house—north track—60 lb rail	400			940		940			
Spur back of dock—60 lb rail	Spur back of Nester block	Roach and Seever warehouse	320			320		281			
No. 1 crossover on No. 4 dock—60 lb rail		60 lb rail	100			100					100
No. 2 crossover on No. 4 dock—60 lb rail		60 lb rail	120			120					120
Cement block factory			460			361		460			
No. 1 ore dock—central track and dock	Taken up—1912										
North track	Taken up—1912		826								
Crossover near "Y"	Omitted	Omitted	1,600								
Crossover near outer end 1	Taken up—1912		143								
Crossover near outer end 2	Taken up—1912		137								
North side of dock—70 lb			137								
South side of dock—70 lb		Taken up—1913	136			136					
Built 1912-1913		Taken up—1913	136			136					
	Spur between 3rd and 4th Sts.—Temporary spur for construction of Frt. House—Taken up										
Old scrap track 3rd to 5th			1,400			435					
UPPER YARD											
Crossover coal shed	Omitted										
Diagonal track No. 1			180				180				
No. 2			900			900					900
No. 3			890			890					890
No. 4			810			810					810
No. 5			790			790					790
No. 6			780			780					780
No. 7			770			770					770
No. 8			770			770					770
No. 9			770			770					770
Ladder track No. 10			770			770					770
			2,430			2,430					2,430

Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913			
				F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
				These columns show the length of Side Tracks in Feet									
	Wrecking train spur				375		489			375			
		C. F. & L. Co. branch	0.29 mi.										
	Mill track north side				631			631			631		
	Mill track south side				697			697			697		
	Sinclair's quarry				2,350			2,350			2,350		
	Passing track on above				575			425			575		
	No. 1 north ore siding				2,400			2,069					2,400
	No. 2 north ore siding				1,350			1,320					1,350
	No. 3 north ore siding				1,140			1,148					1,140
	No. 4 north ore siding				1,060			979					1,060
	Spur E of scales				500			1,102					500
	Scales crossover 1 E				170			288					170
	Scales crossover 2 E				140		126						140
	Scales crossover 1 W				150			150					150
	N. scales siding				2,240			2,240					2,240
	C. scales siding				2,450			2,450					2,450
	S. scales siding				2,240			2,240					2,240
	Kennedy's shop spur				240			240			240		
	Brewery spur				312			312			312		
	Upper yard crossover 5th St.			170			170			170			
	Main track to shop yard			3,165			3,165			3,165			
	Store house spur			220			234			220			
	Track N. of car shops			1,330			1,258			1,330			
	Boiler shop spur			310			724			310			
	North track car shops—	Taken up—1912		130									
	Center track car shop			820			804			820			
	South track car shop			870			840			870			
	Paint shop			540			540					540	
	Car storage track No. 1			490			490			490			
	No. 2			440			440			440			
	No. 3			430			430			430			
	No. 4			370			370			370			
	No. 5			310			310			310			

	Old main line												
	Spur S. of coal shed			3,650				3,650		3,650			
	Siding N. of coal shed			500				513		500			
	Turntable, East			2,060			1,950			2,060			
	Turntable, West			330			330			330			
	New crossover			180			180			180			
	Cinder pit			140			140			140			
	Turntable		Depressed	220			220			220			
	Tracks in engine house (14)			50			70			58			
	Machine shop 1			1,540			1,540			1,540			
	Machine shop 2			251			251			251			
	Siding near coal shed			205			205			205			
	Crossover East			1,080			856			1,080			
	Crossover West			180			217			180			
	Coal shed main track	Omitted		160			217			160			
	Ore shed			1,570							1,570		
	Omitted	2nd spur south coal pocket	Omitted	2,080			2,166					2,080	
	Can't locate	1st track S. of main track	Can't locate					547					
156.3		Dead river branch	2.78 mi.				373						
	Fair grounds spur		60 lb rail		310		310						
	Powder mill siding—60 lb		Taken up—1913—60 lb rail		934			934			310		
	Powder mill spur—60 lb		Taken up—1913		2,520			2,520			294		
	Powder mill mag spur—60 lb		Taken up—1913		184			184					
	Log bridge E				421			421			421		
	Richelieu saw mill	S. & B. saw mill	Schneider & Brown's saw mill No. 1 track		500			1,070			600		
	Built 1913		Schneider & Brown's saw mill, No. 2 track								532		
	Built 1913		Schneider & Brown's saw mill, No. 3 track								472		
160.5	Bagdad passing track			2,358			2,358			2,358			
2.1B	South track spur No. 2		Taken up—1913		90			90					
3.7B	Built 1912	Spur No. 3	Taken up—1913					90					
7.0B	South track spur No. 7—Tub. Hosp.				350			350			350		
162.6	Eagle Mills—passing track			2,380			2,260			2,260			
	M. & W. connection	"Y"—east leg and west leg	Connection with N. & S. main line		2,515		2,515			2,515			
	Spur S. side of dock	Passing track			1,287			1,287			1,287		
	Old main line to Carp Hill				5,400			5,400					5,400
	Built 1912	Crossover slip					248			249			
	Built May, 1912	Passing track						1,588		1,588			

Mile Post	Riggs—1911—Exhibit 1		Hansel—1912—Exhibit 15		Riggs—1913—Exhibit 1-A		1911			1912			1913			
							F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
							These columns show the length of Side Tracks in Feet									
11.7B	Queen Mine—Coal trestle jct. C. & N. W.	540′	Removed during the spring of 1912					270								
	Track east of Negaunee Mine switch							1,425			1,425					1,425
	Crossover to Queen Mine yard							282			282					282
	Blue Mine connection															
	Negaunee Mine—joint with C. & N. W. R'y and L. S. & I. R'y							535			535					535
166.8					Branch 0.80 mi. D., S. S. & A. owns ⅓=0.27 mi.											
	Track No. 2 shaft	1,029′		1,029′		1,029′		343			343					343
	Coal trestle track	478′		478′		478′		159			159					159
	Stock track	716′		716′		716′		239			239					239
	Shovel track	206′		206′		206′		69			69					69
	No. 1 shaft	1,521′		1,521′		1,521′		507			507					507
	Siding at shaft	767′		767′		767′		256			256					256
	Timber track	672′		672′		672′		224			224					224
	Coal trestle	1,149′		1,149′		1,149′		383			383					383
	Coal trestle No. 2 track	603′		603′		603′		201			201					201
	Steam shovel track	191′		191′		191′		64			63					63
			Negaunee and Palmer branch		4.19 mi.											
	Spur to Rolling Mill mine							906			906					906
			Milwauke Mine branch		1.74 mi.											
	Pocket track							1,250			1,250					1,250
	Coal track							615			615					615
	Breitung Hematite Mine—½ interest C. & N. W.															
	Main track	1,887′		1,887′		1,887′		944			943					943
	Track No. 1	1,147′		1,147′		1,147′		574			573					573
	Crossover	184′		184′		184′		92			92					92
	Spur No. 1—No. 1 shaft	631′	Extended Sept., 1911	758′	Same as 1912	758′		316			379					379
	Spur No. 2—No. 1 shaft	481′	Extended Sept., 1911	615′	Same as 1912	615′		240			307					307
	Coal trestle—all D., S. S. & A.		Extended Sept., 1911					450			515					515

| | | |

Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913			
				F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
				These columns show the length of Side Tracks in Feet									
	Built 1913		Storage track 748'										374
	Built 1913		Steam shovel spur 436'										218
	Volunteer Mine—old location												
	End of M. & P. branch	Taken up			71								
	Spur to Mine				2,361			2,361					2,361
	Siding at old shaft				848			848					848
	Siding on above				524			524					524
	Wood spur				248			248					248
	Switch back				600			600					600
	Spur on above				350			350					350
	C. & N. W. connection				300			300					300
	Spur on C. & N. W. back				300			300					300
	Stock track No. 1				1,536			1,536					1,536
	Stock track No. 2				400			400					400
		Spur	Taken up					393					
166.8	Negaunee												
	All tracks about Negaunee				18,540								
		Ore track No. 1 N						1,935					1,935
		No. 2 N						1,683					1,683
		No. 1 S						1,460					1,460
		No. 2 S						1,218					1,218
		Crossover to "Y"					200						200
		Negaunee "Y"					904						904
		C. F. & L. spur						682			682		
		C. F. & L. coal track						780			780		
		Coal shed north side						975			975		
		C. F. & L. shed						433			433		
		Crossover					196				196		
		Depot passing track					924					924	
		Crossover east					195			195			
		Crossover west					163			163			

		Siding south of depot															
		Negaunee & Palmer connection										1,314			1,314		
		Negaunee & Palmer connection											875				875
		M. conn. Negaunee & Palmer											660				660
		Old main line											2,925				2,925
		Siding on above											550			550	
		Passing track L. S. & I.											650			650	
		Siding south main line											1,266				1,266
	Built 1912				Freight house spur								803				803
																354	
	Cambria Mine—"Y"—east leg	Taken up Nov., 1911					286										
	West leg	Taken up Nov., 1911					385										
	Coal track						438						438				438
	C. & N. W. crossover						120						120				120
	Lilly Mine Coal Tr.—joint C. & N. W.	539′	Taken up				270										
	Switch				Stock track—joint C. & N. W.	272′	272						272				136
	Pocket track	2,352′		2'352′	Taken up		1,176						1,176				
	Siding	756′		756′	Taken up		378						378				
	Coal trestle	742′		742′	Taken up		371						371				
	Switch back	1,352′		1,352′		1,352′	676						676				676
	Spur on above	710′		710′		710′	355						355				355
	Built 1912		Jackson mine Connection with L. S. & I.										420				420
	Teal Lake branch—South main line		Teal Lake Branch		1.39 mi.												
	—joint C. & N. W.	2,430′	Hartford mine	2,430′		2,430′	1,215						1,215				1,215
	North main line	2,188′		2,188′		2,188	1,094						1,094				1,094
	Coal shed	750′		750′		750′	375						375				375
	Old shaft	1,823′		1,823′		1,823′	912						911				911
	Siding new shaft	760′		760′		760′	380						380				380
	Timber track	557′		557′		557′	278						278				273
	N. stock track	862′		862′		862′	431						431				431
	S. stock track	1,000′		1,000′		1,000′	500						500				500
	Stocks track No. 1	482′		597′		482′	241						298				241
	No. 2	440′		440′		440′	220						220				220
	No. 3	418′		418′		418′	209						209				209
	Bought ½ interest, 1912				Marquette Co. Gas. Co. coal trestle	878′										439	
	Bought ½ interest, 1912				Marquette Co. Gas Co. coal trestle	361′										180	

Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913			
				F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
				These columns show the length of Side Tracks in Feet									
169.8	Ishpeming												
	Crossover to C. & N. W. line				296			296			296		
	Coal shed				979			979			979		
	1st track south of main line				1,300			1,300			1,300		
	2nd track south of main line				959			959			959		
	Transfer siding				1,127			1,127			1,127		
	West end of C. & N. W. trasnfer				349			349			349		
	Spur N. side main line				540			540			540		
	Depot spur No. 1				500			500			500		
	No. 2				305			305			305		
	No. 3				200			200			200		
	Barnum mine connection				278			278					278
	L. S. & I. R'y connection	Taken up			90								
	C. & N. W. R'y connection				90			90		90			
	Passing track			1,325			1,325			1,325			
	Pit No. 7 Lake Superior Mine—joint C. & N. W.		Branch 0.69 mi., D. S. S. & A.—½ interest—0.34 mi.										
	Stock track 827′	827′	827′		414			413					413
	Pocket track 426′	426′	426′		213			213					213
	Pocket track 625′	625′	625′		312			312					312
	No. 6 stock track 637′	637′	637′		318			319					318
	Steam shovel 198′	198′	198′		99			99					99
	Stock track north 358′	358′	358′		179			179					179
	Steam shovel 192′	Omitted	192′		96								96
	Coal shed conn. 359′	Taken up			180								
	Section 16 and Lake Angeline Mine s												
	Main track and east section of "Y"				1,850			1,850					1,850
	West crossover to C. & N. W.				97			97					97
	East crossover to C. & N. W.				86			96					96
	Storage siding				1,660			1,660					1,660
	Spur N. stock pile 1,078′	1,078′	Joint with C. & N. W. 1,078′		539			539					539
	Spur S. stock pile 819′	819′	Joint with C. & N. W. 819′		410			409					409
	Stock pile south of main line 525′	525′	Joint with C. & N. W. 525′		262			262					262

North track	1,164'	Joint	1,164'	Joint	1,164'	582		582				582
Stock track north	550'		550'		550'	275		275				275
Stock track south	600'		600'		600'	300		300				300
North pocket track	575'		575'		575'	288		287				287
South pocket track	546'		546'		546'	273		273				273
South pocket track	311'		311'		311'	156		155				155
Lake Angeline Siding	536'		536'		536'	268		268				268
Lake Shaft Mines												
No. 3 shed—joint C. & N. W. & L. S. & I.	1,128'		1,128'		1,128'	376		376				376
Stock track	363'		363'		363'	121		121				121
Stock track	377'		377'		377'	126		126				126
				Lake shaft branch—0.95 mi.—joint ⅛								
Crossover No. 1 to main line						240		240				240
Cossover No. 2 to main line						244		244				244
1st track north of main line	3,757'		3,757'		3,757'	1,252		1,252				1,252
Crossover to stock ground	200'		200'		200'	67		66				66
Stock track No. 1	400'		400'		400'	133		133				133
Stock track No. 2	300'		300'		300'	100		100				100
Center track on coal shed	600'		600'		600'	200		200				200
North track on coal shed	425'		425'		425'	142		142				141
South track on coal shed	330'		330'		330'	110		110				110
Spur east of coal shed	530'		530'		530'	177		176				176
Siding north of shaft	975'		975'		975'	325		325				325
Shovel	350'		350'		350'	117		117				117
East crossover	200'		200'		200'	67		66				66
West crossover	220'		220'		350'	73		73				117
Conn. N. & S.	350'		350'	Omitted		117		117				
Lake Superior Hematite Mine												
Pocket track No. 1—joint ⅛	942'	Joint ½	942'	C. & N. W joint ⅛	942'	314		471				471
Pocket track No. 2	585'		585'		585'	195		292				292
Crossover	372'		572'		572'	124		286				286
Stock track No. 1	660'		660'		660'	220		330				330
No. 2	258'		258'		258'	86		129				129
No. 3	150'		150'		150'	50		75				75
South Ishpeming												
Lake Superior mine "Y"						899		899				899
Track N. of main line						2,425		2,425				2,425
Spur No. 1 N. of depot						760		760		760		
Spur No. 2 N. of depot						600		600		600		

Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913			
				F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
				These columns show the length of Side Tracks in Feet									
	1st siding S. of main line—E. of engine house				2,000			2,000					2,000
	2nd siding S. of main line—E. of engine house				1,130			1,130					1,130
	3rd siding S. of main line—E. of engine house				1,030			1,030					1,030
	Co-operative store spur joint C. & N. W. 225′	225′	Joint 225′		112			112			112		
	1st track S. of main line—W. of engine house			1,300				1,300					1,300
	2nd track S. of main line—W. of eng. house			1,075				1,075					1,075
	Spur on above to engine house			550				550					550
	Engine house spur			335				335					335
	In engine house—7 stalls			630				630					630
	Old Saginaw branch—Winthrop Junction				1,550			1,550					1,550
171.4	Winthrop Junction												
		Winthrop branch	All D., S. S. & A.—1.94 mi.										
	DuPoint Powder spur				206			206			206		
	Crossover at Diamond crossing				150			150					150
	Timber track				324			324					324
	Main line to Mine—joint C. & N. W. 4,047′	4,047′	4,047′		2,024			2,023					2,023
	Siding 1,728′	1,728′	1,728′		864			864					864
	Spur No. 1 shaft 1,179′	1,179′	1,179′		590			589					589
	No. 1 stock pile 746′	746′	746′		373			373					373
	Spur on above 487′	487′	487′		244			243					243
	Loose track 285′	285′	285′		142			142					142
	No. 2 stock pile 748′	748′	748′		374			374					374
	Loose track 247′	247′	247′		124			123					123
	Steam shovel 117′	117′	117′		58			58					58

| | | |

Mile Post	Riggs—1911— xhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913			
				F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
				These columns show the length of Side Tracks in Feet									
	Built 1912 and 1913	No. 4 467'	467'					233					233
181.6	Humboldt												
	1st track south of main line			1,796			1,796			1,796			
	2nd track south of main line				1,590			1,590			1,590		
	3rd track south of main line				1,416			1,416			1,416		
	Ore track				239			239					239
	Track N. of main line			1,398				1,398			1,398		
	"Y" track			1,198			1,198				1,198		
	Republic branch		8.70 mi.										
0.00	Baron mine spur				2,300			2,300					2,300
	Lumber track				465			465					465
	Stock track				520			520					520
	Loading track				148			148					148
	Car track				712			712					712
	Midway siding				1,281		1,281			1,281			
	Milwaukee Junction conn.				91			91		91			
	Crusher track				522			522					522
	Pocket track				783			783					783
	Coal track				339			375					375
	Timber track				468			468					468
	Franklin pit spur No. 1				592			592					592
	Franklin pit spur No. 2				421			421					421
	Stock track				589			589					589
	Dock track	Taken up			90								
8.5	Republic												
	Levine spur				315			315			315		
	Depot siding				1,023			1,023		1,023			
	Engine house spur				330			330		330			
	Old Kloman branch				947			947		947			
	Scales track	Taken up			45								

8.7	Republic Mine Yard—joint C. & N. W. and C., M. & St. P.																	
	Mine track	2,216′		2,216′		2,216′		739			739							739
	Stock pile No. 1	350′		350′		350′		117			117							117
	Loading dock	300′		300′		300′		100			100							100
	Crossover No. 1	148′		148′		148′		49			49							49
	Crossover No. 2	150′		150′		150′		50			50							50
	Scales siding	810′	Loading dock	925′	Scales track	810′		270			308							270
	Coal trestle	450′		450′		450′		150			150							150
	Loading dock S. end	1,350′		1,350′		1,350′		450			450							450
	Machine shop siding	925′		925′		925′		308			308							308
	Main joint track	1,815′		1,815′		1,815′		605			607							607
	West Republic mine track	3,924′		3,924′		3,924′		1,098			1,098							1,098
	Stock pile	429′		429′		429′		143			143							143
	Shaft	800′		800′		800′		267			267							267
	Steam shovel	1,049′		1,049′		1,049′		350			350							349
185.7	Champion																	
	Passing track							2,953		2,953			2,953					
	Crossover							200			200		200					
	Main transfer siding—C. M. & St. P.	1,981′		1,981′		1,981′		990			990			990				
	Transfer	1,295′		1,295′		1,295′		647			647			647				
	East end conn.	182′		182′		128′		91			91			91				
	West end conn.	328′		328′		328′		164			164			164				
			Champion mine branch		All D., S. S. & A.—0.98 mi.													
193.3	Michigamme																	
	Log spur east end No. 1 yard							748			748			748				
	Log spur east end No. 2 yard							1,492			1,492			1,492				
	Old mine siding							1,715			1,715							1,715
	Mill track							1,990			1,990			1,990				
	C. & N. W. connection							299			299			299				
	C. & N. W. connection				Taken up			112			112							
	Spur west of depot							501			501			501				
	Spur N. of main line							646			646		646					
	Dining car spur								552			552				552		
	Track at depot					1,544				1,544			1,544					
	Engine house spur					420				420			420					
	Turntable					50				50			50					
	No. 1 engine house stall					100				100			100					

Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913			
				F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
				These columns show the length of Side Tracks in Feet									
	No. 2 engine house stall			100			100			100			
	Cinder track			357			357			357			
	Built Nov., 1912		Engine storage tracks—75′ each							150			
194.3		Imperial mine branch	0.91 mi.										
			Webster Mine branch—0.89 mi.										
	Webster mine siding	Taken up			142								
	Crossover	Taken up			202								
	Imperial mine pocket spur				1,412			1,412					1,412
	Crossover				132			132					132
	Stock pile track				504			504					504
	Coal trestle				363			363					363
	Portland mine dump track				555			555					555
	Passing track				931			931					931
	Stock track				990			990					990
	Built June, 1912	East stock track	800′ Taken up Nov., 1912					1,093					293
196.0	Beaufort branch—joint C. & N. W.		0.88 miles										
	Beaufort branch Ohio shaft spur 2,030′	2,030′	2,030′		1,015			1,015					1,015
	Siding 1,114′	1,114′	1,114′		557			557					557
	Coal track 491′	491′	491′		245			245					245
	Timber spur 972′	972′	972′		486			486					486
	Norwood siding 1,348′	1,348′	Taken up June, 1913		674			674					
	Beaufort siding 1,794′	1,795′	Taken up June, 1913		897			897					
	Run around 300′	300′	Taken up June, 1913		150			150					
198.0	Three Lakes—passing track			1,980			1,980			1,980			
200.9	Nestoria												
	Siding on Houghton Division			1,030			1,030			1,030			
	Coal trestle No. 1			1,213			1,213				1,213		
	No. 2			470				470			470		

	Switch Coal trestle "Y" track	Omitted		120 787	1,102		1,102	120			120 787	1,102		
	Total length of side track—	56 lb rails—owned and exclusively	used by D., S. S. & A.	50,438	190762	3,688				52,214	66,464	7,094	100612	
	Total length of side track—	56 lb rail—apportioned to D., S. S. & A. and jointly used		0	50,993	0	No wei	ghts gi	ven	0	3,757	0	54,144	
	Total length of side track—	60 lb rail—owned and exclusively	used by D., S. S. & A.	0	13,193	0				0	3,049	0	6,860	
	Total length of side track—	70 lb rail—owned and exclusively	used by D., S. S. & A.	0	6,777	0				0	0	0	6,505	
	Total Marquette to Nestoria			50,438	261725	3,688	53,176	247,972	4,348	52,214	73270	7,094	168121	
	NESTORIA TO HOUGHTON:													
2.5	Birch—freight spur				350			350			350			
5.7	Tama—freight spur		Partly taken up Dec., 1912		1,008			1,008			494			
7.4	Summit					368			368			512		
	Dining car spur	Extended												
	Siding No. 1	Shortened	Spur	1,361			1,361				1,176			
	Siding No. 2		Passing track		1,521		1,521			1,511				
	Spur				785			785			765			
8.3	Shirley—wood spur				526			526			526			
9.0	Herman—spur	Passing track	Same as 1912		661		661			661				
	Passing track	Wood spur	Same as 1912	800				800			800			
12.4	Taylor Junction—spur				1,293			1,293		1,293				
14.5	Bovine—spur				713			713			713			
14.6	Brennan spur				524			524			524			
16.8	L'Anse													
	Siding lower yard		Dock tr.		757			757			757			
	Spur				179			179			179			
	Cedar yard	Taken up Aug., 1911			1,214									
	Spur		On hill		1,025			1,025			1,025			
	Spur W. of tank				350			350		350				
	Team track				304			304			304			
	Engine house		Track No. 1	300			300			300				
	Coal shed			412			412				412			
	Passing track			1,148			1,148			1,148				
		L'Anse mdse. dock br.	0.75 mi											
	Built Dec., 1912		Third rail—Marshall Butters mill 1,460'								730			
	Built Dec., 1912		Third rail—shop track—Marshall Butters mill 356'								178			

Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 1 5	Riggs—1913—Exhibit 1-A	1911			1912			1913			
				F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
				These columns show the length of Side Tracks in Feet									
			Third rail—mill track—										
	Built Dec., 1912		Marshall Butters mill 930′								465		
	Built Dec., 1912		Marshall Butter Co. main track								1,830		
			Engine house track No. 2							200			
22.1	Baraga—siding	Now part of storage track		1,651									
		Mill branch	0.46 mi.										
	North spur	Shortened			530			475			475		
	Mill spur	Extended			340			600			600		
	Storage siding	Connected with 1,651′ siding			1,705		3,189			3,189			
	Baraga Lumber Co. mill	Shortened			999			710			710		
	Ferry dock track				387			387			387		
	Built Nov., 1912		Water Works spur								313		
	Built 1912	Storage siding crossover						195		195			
24.5	Assinnins spur				278			278			278		
25.1	Seney—log spur		Taken up Dec., 1912		436			436					
26.6	Iron Bridge—passing track			1,698			1,698			1,698			
28.5	Keweenaw Bay												
	Coal track				921		921				921		
	Mass warehouse				492			492			492		
	Mill coal track				675			675			675		
	Team track				313			313			313		
	Passing track			2,393			2,393			2,393			
30.1	Newton—siding				917			917		917			
32.4	Arnheim	Quarry branch	0.69 mi.										
	Mill siding				1,115			1,115			1,115		
	Passing track			1,500			1,500			1,500			
35.0	Mullen—spur				900			900			900		
35.8	Farley—spur		Taken up Dec., 1912		355			794					
37.9	Fouchette—spur				285			285			285		
39.5	Built Nov., 1912		Danielson spur								400		

40.6	Chassell				3,065		3,065		3,065				
	Passing track				2,686			2,686		2,686			
	Mill spur				497			497		497			
	Spur at depot				528			528		528			
	Spur at dock				753			753		753			
	Lumber yard siding				490			734		734			
	Planing mill	Extended March, 1912			485			485		485			
	Cedar yard									506			
	Built 1912		Log track							257			
	Built 1912		Shavings track										
46.0	Isle Royal mill conn. at coal dock				103			103		103			
	Built Nov., 1912		Pilgrim track connection							92			
	Built Nov., 1912		Pilgrim track							2,295			
46.5	Pilgrim track spur	Taken up			830								
46.9	Glanville—spur	Extended June, 1912	Stamp sand track No. 1		288			950		950			
	Built June, 1912	New sand track	Houghton stamp sand track No. 2					1,059		1,059			
48.6	Houghton				1,632		1,632		1,632				
	Storage siding E. end	Passing track			1,625			1,625		1,625			
	2nd siding N. of main line				1,450			1,450		1,450			
	3rd siding N. of main line				1,530			1,530		1,530			
	Shore track				850			850		850			
	Siding S. of above				435			435		435			
	Crossover				800			400		400			
	Porter's stone trestle	Shortened			1,400			1,400		1,400			
	Track at foot of hill				310			310		310			
	S. of freight platform				210			210		210			
	Scales crossover				598			598		598			
	Mining school coal spur			1,800				1,800		1,800			
	1st siding N. of main line			335			325		325				
	Track to turntable			50			50		50				
	Track on turntable			320			320		320				
	In engine house												
	Total Nestoria to Houghto	n (all 56 lb rail—owned and exclusi	vely used by D., S. S. & A.)	13,768	42,423	368	20,496	35,589	368	20,747	40,645	512	0
	Total Marquette to Nestori	a		50,438	261725	3,688	53,176	247972	4,348	52,214	73,270	7,094	168121
	Total Marquette to Ho	ughton		64,206	304146	4,056	73,672	283561	4,716	72,961	113915	7,606	168121

Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913			
				F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
	NESTORIA TO STATE LINE:			These columns show the length of Side Tracks in Feet									
200.9	Siding on Duluth line S.				1,640			1,640			1,640		
	Siding on Duluth line N.				1,639		1,639				1,639		
	Crossover				185			185			185		
	Car repair spur				230			230			230		
	Scales dead rail				154			154			154		
205.3	Built Dec., 1912		Tioga spur								550		
206.8	King Lake—spur				415			415			415		
211.0	Vermilac—passing track				1,517		1,517			1,517			
213.4	Murphy—track				893			893			893		
214.0	Murphy Pit—wood spur				1,244			1,244			1,244		
	Spur No. 1				1,810			1,810			1,810		
	Spur No. 2				1,495			1,495			1,495		
214.4	461' built July, 1911—extended Dec., 1911	Foy Mill—spur						551			551		
215.0	Covington—Oakley spur				1,072			1,072			1,072		
	Track			1,100			1,100				1,100		
	Built June, 1913		Passing track							2,137			
215.5	Paquette	Mill branch	0.43 mi.										
	Mill spur				224			224			224		
216.5	Leo—spur No. 1				576			576			576		
	Spur No. 2				600			600			600		
217.1	Opal—spur				600			600			600		
217.7	Robinson—spur		Extended 72' Nov.,1 912		965			965			1,037		
218.7	Watton—track				885			885			885		
220.0	Hutula—spur				933			933			933		
221.0	Perch—passing track				2,004		2,004			2,004			
221.9	Keeler—spur				372			372			372		
224.1	Sidnaw												
	North conn.				103			103			103		
	South conn.				549			549			549		
	Pocket—wood spur	Taken up			440								

	Fowler and Bilson spur—joint C., M. & St. P.	1,900′	1,900′		1,900′		950		950		950		
	Diamond Match Co.	918′	918′		918′		459		459		459		
	Unloading spur	529′	529′		529′		264		264		264		
	Passing track					1,490		1,490		1,490			
							1,500		1,500		1,500		
227.7	Anthony—passing track			Gravel pit track								2,497	
	Built 1913						1,441		1,441		1,441		
230.0	Kitchie—passing track												
233.3	Kenton					1,295			1,295		1,295		
	Withey passing track						305		305			305	
	Frost R. R. conn.						1,756		1,131			1,131	
	Kroll's mill		Taken up 1912				352		352			352	
	Planing mill						515		513			515	
	Planing mill spur						350		350			350	
	Coal shed						139		139			139	
	Slab track						2,005	2,005			2,005		
	Depot siding						779		779			779	
235.2	Jumbo—spur												
239.1	Trout Creek			Omitted			700						
	East siding		Omitted	Omitted			2,229						
	Planing mill		Omitted	Omitted			827						
	Lumber spur		Omitted	Omitted		2,496			842			842	
	West siding		Depot track										
	Omitted		Trout Creek Mfg. Co. branch	0.33 mi.					1,305			1,305	
	Built 1912-1913		Lumber track						1,036			1,036	
	Built 1912-1913		Shingle mill						1,264		1,264		
	Built 1912-1913		Passing track										
	Built 1912-1913		Weidman branch	7.47 mi.—S. south owns metal only—operated by W. Co. South Shore ballasted track					730			730	
	Built Aug., 1912		Passing track at dam						640			640	
	Built 1912-1913		Spur at station 170						420			420	
	Built Aug., 1912		Spur at Black Pat shanty						700			700	
	Built Aug., 1912		Lumber track No. 1						910			910	
	Built Aug., 1912		No. 2						1,260			1,260	
	Built Aug., 1912		No. 3						320			320	
	Built Aug., 1912		Wood track						240			240	
	Built Aug., 1912		Engine house spur						240			240	
	Built Aug., 1912		Spur at tramway										

Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913			
				F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
				These columns show the length of Side Tracks in Feet									
241.9	Agate spur	Extended 100' May, 1912			603			709			709		
243.1	Built 1913		Spur at bridge No. 314								680		
244.3	Falls spur				500			500			500		
244.5		Basco branch	1.35 mi.										
	Basco spur	Spur No. 1			332			450			450		
	Built March, 1912	No. 2						750			750		
245.0	Built March, 1912	Ruby gravel track						1,470			1,470		
	Built Nov., 1912		Log spur								1,879		
246.5	Paynesville—passing track				1,430		1,430			1,430			
	Spur				480			480			480		
248.2	Gem spur				300			300			300		
249.0	Bruce's Crossing—old mill spur	M. P. 250.1	Same as 1912		361			361			361		
250.5	St. Collins—passing track			2,012			2,012			2,012			
250.8	Built in 1913		Spur at bridge No. 317								360		
252.5		Baltimore branch	58.5 mi.										
	Baltimore Branch—Spur No. 1				150			150			150		
	No. 2				72			72			72		
	No. 3				255			255			255		
255.3	Ewen												
	Warehouse track				535			535			535		
	Saw mill spur				927			927			927		
	Spur on above				434			434			434		
	West leg of "Y"				898		898				898		
		Jensen's Mill branch	1.00 mi.										
	Switch at Jensen's branch				167			167			167		
	Built 1912	Spur at mill						580			580		
	Built 1912	Warehouse						300			300		
	Built 1912	Log track						500			500		
	Built Sept., 1912	Lumber track						2,030			2,030		
	Built Sept., 1912	East planing mill spur						630			630		
	Built Sept., 1912	West planing mill spur						260			260		
	Coal shed			665			665				665		

	On coal shed			496		496		496		496	
	Passing track			1,463		1,463		1,463			
	Built Oct., 1912		West passing track					1,065			
					550		550		550		
259.5	Lindstedt spur				623		623		623		
261.2	Matchwood spur				2,013	2,013		2,013			
263.5	Groesbeck—passing track				545		545		545		
264.7	Topaz—spur						445		445		
267.5	Built Nov., 1912	Louk spur									
					2,935		2,935		2,935		
269.7	Bergland				720		720		720		
	Mill spur to dock										
	Mill pond			1,650		1,650		1,650			
	Passing track										
		Bergland branch	2.80 mi.		560		560		560		
	Spur on Bergland branch										
					1,573	1,544		1,544			
272.3	Lake Gogebic—passing track										
280.1	Camp Francis—Spur No. 1 north side				338		338		338		
		Spur No. 2 south side					784		784		
	Built Nov., 1911						527		527		
281.4	Built Dec., 1911	Tula gravel pit—log spur						8,160			
	Built 1913		Gravel pit tracks		1,203	1,203		1,203			
282.0	Tula—passing track				1,300		1,300		1,300		
	Mill spur										
287.7	Thomaston			2,354		2,354		2,354			
	Siding south side			754		759		759			
	Engine house spur			465		465		465			
	Engine house siding			1,496		1,496		1,496			
	Engine house 16			60		60		60			
	Turntable			930		930			930		
	Coal shed			753		753		753			
	"Y" track west leg			1,330		1,330		1,330			
	"Y" track east leg			368		368		368			
	No. 9 stall			250		250		250			
	No. 10 stall				1,426	1,426			1,426		
	Siding No. side				187	187			187		
	Crossover				520		520		520		
	Siding N. of coal shed				955	953			955		
	Repair spur				1,612	1,612			1,612		
	Run around track										

Mile Post	Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913			
				F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	F.& P.	Frt.	Pass.	Ore
				These columns show the length of Side Tracks in Feet									
	Heater spur				218		218			218			
	Built Oct., 1912		Passing track							1,455			
290.1	Planter spur				400			400			400		
292.1	Abitosse—passing track				2,012		2,012			2,012			
292.8	Massie—log spur				473			473			473		
293.9		Bessemer branch	2.23 mi.										
	Track at Bessemer			1,030				1,030			1,030		
294.1	Erickson spur				245			248			245		
	Built Dec., 1912		Spur No. 2								238		
294.7	North Bessemer log spur		540' Taken up Dec., 1912		940			940			900		
295.3	Woodroy—log spur				484			484			484		
296.7	Black River—spur	Extended Dec., 1911			365			483			485		
297.7	Sillberg—spur	Extended Dec., 1911			492			612			612		
300.5	Montreal—passing track			1,650			1,650			1,650			
301.2	Built Nov., 1911	Junet—log spur						250			250		
	Total length of side track—	56 lb rail—owned and exclusively	used by D., S. S. & A.	24,107	63,576	0		56,052		48,363	70,480	0	
	Total length of side track—	56 lb rail—apportioned to D., S. S.	& A. and jointly used		1,673			1,673			1,673		
	Total Nestoria to State	Line		24,107	65,249	0	43,735	57,725	0	48,363	72,153	0	

† These items, in 1911 and 1913 appraisals, are for track used jointly by D., S. S. & A. with other roads. Figures given are the quantities and amounts apportioned to D., S. S. & A. All other items are for track owned and used exclusively by D., S. S. & A.
See note under 1912.

* These quantities and am'ts have been corrected in accordance with the testimony of Mr. Riggs.

1911

Note: The unit prices as used in this schedule are:

Wt. of Rail lbs per yd.	Unit price per track ft. C.R.	P.V.
56	$ 1.07	$0.8945
60lb	1.095	0.915
70lb	1.158	0.967

1912

Note: Mileage given represents D., S. S. & A. ownership, the proper portion of tracks having been assigned to D., S. S. & A.

1913

Note: The cost of sidetracks per lineal foot includes the cost of cross ties from point of switch to point of switch. No cross ties are laid through turn-outs, their places being taken by switch ties which are included in Schedule No. 9.
Therefore the value of cross ties from point of switch to heel of frog is deducted from Schedule of Side Tracks.
The unit prices as used in this Schedule are:

Wt. of rail lbs per yd.	Unit price per track foot C.R.	P.V.
56 lb	$1.15	$1.044
60 lb	1.18	1.077
70 lb	1.264	1.16

	1911			1912			1913							1911		1912				1913	
	Length of Side Tracks			Length of Side Tracks			Length of Side Tracks		Deductions as per above note					C.R.	P.V.	C.R.		P.V.		C.R.	P.V.
	Weight of rail lbs per yd.	Feet	Miles	Weight of rail lbs per yd.	Feet	Miles	Weight of rail lbs per yd.	Feet	Miles	No. of Turn-outs	Price	C.R.	%	P.V.			Per Mile	Total	Per Mile	Total		
EAST OF MARQUETTE FREIGHT AND PASSENGER											$	$		$	$	$	$	$	$	$	$
Saulte Ste. Marie to Marquette	56	54,729	10.37	Not given	50,746	9.61	56	45,092	8.54						58,560	49,955	5,355	51,462	4,170	40,073	51,856	47,076
	†56	3,762	0.71				†56	2,708	0.51						4,024	3,365					3,114	2,827
	60	1,487	0.28				60	2,309	0.44						1,628	1,361					2,725	2,487

										116	18	2,088	60	1,253								2,088	1,253
Total		59,978	11.36		50,746	9.61		50,109	9.49						64,212	53,681		51,462		40,073	55,607	51,137
St. Ignace to Soo Jct.	56	18,021	3.41	Not given	11,955	2.27	56	* 19,772	* 3.74						19,282	16,120	5,355	12,155	4,170	9,466	* 22,738	* 20,642
							60	2,347	0.45												2,769	2,528
																					* 25,507	* 23,170
										71	18	1,278	60	767							1,278	767
Total		18,021	3.41		11,955	2.27		* 22,119	* 4.19						19,282	16,120		12,155		9,466	24,229	* 22,403
		59,978	11.36		50,746	9.61		50,109	9.49						64,212	53,681		51,462		40,073	55,607	51,137
Total F. & P. East of Marquette		77,999	14.77		62,701	11.88		* 72,228	* 13.68	187					83,494	69,801		63,617		49,539	* 79,836	* 73,540
FREIGHT																						
Sault Ste. Marie to Marquette	56	76,212	14.43	Not given	104,587	19.80	56	64,786	12.27						81,547	68,172	5,355	106,029	4,170	82,566	74,504	67,637
	†56	19,353	3.66				† 56	27,529	5.21						20,708	17,311					31,658	28,740
	60	6,873	1.30				60	1,707	0.32						7,526	6,288					2,014	1,838
																					108,176	98,215
										233	18	4,194	60	2,516							4,194	2,516
Total		102,438	19.39		104,587	19.80		94,022	17.80						109,781	91,771		106,029		82,566	103,982	95,699
St. Ignace to Soo Jct.	56	53,140	10.06	Not given	72,525	13.74	56	* 64,271	* 12.17						56,860	47,534	5,355	73,578	4,170	57,296	* 73,911	* 67,099
	60	9,082	1.72				60	4,355	0.82						9,944	8,310					5,139	4,690
																					* 79,050	* 71,789
										75	18	1,350	60	810							1,350	810
Total		62,222	11.78		72,525	13.74		* 68,626	* 12.99						66,804	55,844		73,578		57,296	* 77,700	* 70,979
		102,438	19.39		104,587	19.80		94,022	17.80						109,781	91,771		106,029		82,566	103,982	95,699
Total Freight East of Marquette		164,660	31.17		177,112	33.54		* 162,648	* 30.79	308					176,585	147,615		179,607		139,862	* 181,682	* 166,678

	1911			1912			1913								1911		1912				1913	
		Length of Side Tracks			Length of Side Tracks			Length of Side Tracks		Deductions as per above note							C.R.		P.V.		C.R.	P.V.
	Weight of rail lbs per yd.	Feet	Miles	Weight of rail lbs per yd.	Feet	Miles	Weight of rail lbs per yd.	Feet	Miles	No. of Turn-outs	Price	C.R.	%	P.V.	C.R	P.V.	Per Mile	Total	Per Mile	Total		
PASSENGER											$	$		$	$	$	$	$	$	$	$	$
Sault Ste. Marie to Marquette				Not given	145	0.03	56	1,185	0.22								5,355	161	4,170	125	1,363	1,237
							† 56	1,184	0.22												1,362	1,236
																					2,725	2,473
St. Ignace to Soo Jct.										1	18	18	60	11							18	11
Total Passenger		0	0		145	0.03		2,369	0.44	1					0	0		161		125	2,707	2,462
Total Freight and Passenger		77,999	14.77		62,701	11.88		* 72,228	* 13.68	187					83,494	69,801		63,617		40,539	* 79,836	* 73,540
Total Freight		164,660	31.17		177,112	33.54		* 162,648	* 30.79	308					176,585	147,615		179,607		139,862	* 181,682	* 166,678
Total East of Marquette		242,659	45.94		239,958	45.45		237,245	44.91	496					260,079	217,416		243,385		180,526	264,225	242,680
MARQUETTE TO HOUGHTON FREIGHT AND PASSENGER																						
Marquette to Nestoria	56	50,438	9.55	Not given	53,176	10.07	56	52,214	9.89	176	18	3,168	60	1,901	53,969	45,117	5,355	53,925	4,170	41,992	60,046	54,511
																					3,168	1,901
Total		50,438	9.55		53,176	10.07		52,214	9.89						53,969	45,117		53,925		41,992	56,878	52,610
Nestoria to Houghton	56	13,768	2.61	Not given	20,496	3.88	56	20,747	3.93	63	18	1,134	69	680	14,732	12,315	5,355	20,777	4,170	16,180	23,859	21,660
																					1,134	680
Total		13,768	2.61		20,496	3.88		20,747	3.93						14,732	12,315		20,777		16,180	22,725	22,340

		50,438	9.55		53,176	10.07		52,214	9.89						53,969	45,117		53,925		41,992	56,878	52,610
Total F. & P. Marquette to Houghton		64,206	12.16		73,672	13.95		72,961	13.82	239					68,701	57,432		74,702		58,172	79,603	73,590
FREIGHT																							
Marquette to Nestoria	56	190,762	36.13	Not given	247,972	46.97	56	* 66,464	* 12.59						204,115	170,637	5,355	251,525	4,170	195,865	* 76,434	* 69,388
	†56	50,993	9.66				† 56	3,757	0.71						54,563	45,613					4,320	3,922
	60	13,193	2.50				60	3.049	0.58						14,446	12,072					3,598	3.284
	70	6,777	1.28												7,848	6,554						
																					84,352	76,594
										197	18	3,546	60	2,128							3,546	2,128
Total		261,725	49.57		247,972	46.97		* 73,270	* 13.88						280,972	234,876		251,525		195,865	* 80,806	* 74,466
Nestoria to Houghton	56	42,423	8.03	Not given	35,589	6.74	56	40,645	7.70						45,393	37,947	5,355	36,093	4,170	28,106	46,742	42,433
										50	18	900	60	540							900	540
Total		42,423	8.03		35,589	6.74		40,645	7.70						45,393	37,947		36,093		28,106	45,842	41,893
		261,725	49.57		247,972	46.97		* 73,270	* 13.88						280,972	234,876		251,525		195,865	* 80,806	* 74,466
Total Freight Marquette to Houghton		304,148	57.60		283,561	53.71		* 113,915	* 21.58	247					326,365	272,823		287,618		223,971	* 126,648	* 116,359
PASSENGER																						
Marquette to Nestoria	56	3,688	0.70	Not given	4,348	0.82	56	7,094	1.34						3,946	3,299	5,355	4,391	4,170	3,419	8,158	7,406
										16	18	288	60	173							288	173
Total		3,688	0.70		4,348	0.82		7,094	1.34						3,946	3,299		4,391		3,419	7,870	7,233
Total Nestoria to Houghton	56	368	0.07	Not given	368	0.07	56	512	0.10						394	329	5,355	375	4,170	292	589	535
Total Passenger Marquette to Houghton		4,056	0.77		4,716	0.89		7,606	1.44	16					4,340	3,628		4,766		3,711	8,459	7,768
ORE																						
Marquette to Nestoria							56	100,612	19.06												115,704	105,039
							† 56	54,144	10.25												62,266	56,526
							60	6,860	1.30												8,095	7,388
							70	6,505	1.23												8,222	7,546

	1911			1912			1913							1911		1912				1913	
	Weight of rail lbs per yd.	Length of Side Tracks		Weight of rail lbs per yd.	Length of Side Tracks		Weight of rail lbs per yd.	Length of Side Tracks		Deductions as per above note				C.R.	P.V.	C.R.		P.V.		C.R.	P.V.
		Feet	Miles		Feet	Miles		Feet	Miles	No. of Turn-outs	Price	C.R.	% P.V.			Per Mile	Total	Per Mile	Total		
											$	$		$	$	$	$	$	$	$	$
Nestoria to Houghton										439	18	7,902	60 4,741							194,287 7,902	176,499 4,741
Marquette to Houghton																					
Total Ore								168,121	31.48	439										186,385	171,738
Total F. & P.		64,206	12.16		73,672	13.95		72,961	13.82	239				68,701	57,432		74,702		58,172	79,603	73,590
Total Freight		304,148	57.60		283,561	53.71		* 113,915	* 21.58	247				326,365	272,823		287,618		223,971	* 126,648	* 116,359
Total Passenger		4,506	0.77		4,716	0.89		7,606	1.44	16				4,340	3,628		4,766		3,711	8,459	7,768
Total Marquette to Houghton		372,410	70.53		361,949	68.55		* 362,603	* 68.68	941				399,406	333,883		367,086		285,854	* 401,095	* 369,475
NESTORIA TO STATE LINE																					
FREIGHT AND PASSENGER	56	24,107	4.57	Not given	43,735	8.28	56	* 48,363	* 9.16					25,795	21,564	5,355	44,339	4,170	34,528	* 55,617	* 50,491
										106	18	1,908	60 1,145							1,908	1,145
Total		24,107	4.57		43,735	8.28		* 48,363	* 9.16	106				25,795	21,564		44,339		34,528	* 53,709	* 49,346
FREIGHT	56	63,576	12.04	Not given	56,052	10.62	56	* 70,480	* 13.35					68,026	56,868	5,355	56,870	4,170	44,285	* 81,052	* 73,581
	†56	1,673	0.32	†	1,673	0.32	† 56	1,673	0.32					1,790	1,497	5,355	1,713	4,170	1,334	1,924	1,747
																				* 82,976	* 75,328
										87	18	1,566	60 940							1,566	940

THIS PAGE BO

Total	65,249	12.36	57,725	10.94	* 72,153	* 13.67	87			69,816	58,365	58,583	45,619	* 61,410	* 74,30 5
	24,107	4.57	43,735	8.28	48,363	9.16	106			25,795	21,564	44,339	34,528	53,709	49,34 6
Total Nestória to State Line	89,356	16.93	101,460	19.22	* 120,516	* 22.83	193			95,611	79,929	102,922	80,147	* 135,119	* 123,734
Total East of Marquette	242,659	45.94	239,958	45.45	237,245	44.91	496			260,079	217,416	243,385	189,526	264,225	24 2,660
Total Marquette to Houghton	372,410	70.53	361,949	68.55	* 362,603	* 68.67	941			399,406	333,883	367,086	285,854	* 401,095	* 369, 475
Total Nestoria to State Line	89,356	16.93	101,460	19.22	* 120,516	* 22.83	193			95,611	79,929	102,922	80,147	* 135,119	* 123,734
Total in Michigan	704,425	133.40	703,367	133.22	720,364	136.42	1,630			755,096	631,228	713,393	555,527	800,439	735,86 6

	1911		1912		1913		1911		1912		1913	
	Feet	Miles	Feet	Miles	Feet	Miles	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
							$	$	$	$	$	$
FREIGHT AND PASSENGER												
East of Marquette	77,999	14.77	62,701	11.88	* 72,228	* 13.68	83,494	69,801	63,617	49,539	* 79,836	* 73,540
Marquette to Houghton	46,206	12.16	73,672	13.95	72,961	13.82	68,701	57,432	74,702	58,172	79,603	73,590
Nestoria to State Line	24,107	4.57	43,735	8.28	48,363	9.16	25,795	21,564	44,339	34,528	53,709	49,346
Total	166,312	31.50	180,108	34.11	* 193,552	* 36.66	177,990	148,797	182,658	142,239	* 213,148	* 196,476
FREIGHT												
East of Marquette	164,660	31.17	177,112	33.54	* 162,648	* 30.79	176,585	147,615	179,607	139,862	* 181,682	* 166,678
Marquette to Houghton	304,148	57.60	283,561	53.71	* 113,915	* 21.58	326,365	272,823	287,618	223,971	* 126,648	* 116,359
Nestoria to State Line	65,249	12.36	57,725	10.94	* 72,153	* 13.67	69,816	58,365	58,583	45,619	* 81,410	* 74,388
Total	534,057	101.13	518,398	98.19	* 348,716	* 66.04	572,766	478,803	525,808	409,452	* 389,740	* 357,425
PASSENGER												
East of Marquette			145	0.03	2,369	0.44			161	125	2,707	2,462
Marquette to Houghton	4,506	0.77	4,716	0.89	7,606	1.44	4,340	3,628	4,766	3,711	8,459	7,768
Nestoria to State Line												
Total	4,056	0.77	4,861	0.92	9,975	1.88	4,340	3,628	4,927	3,836	11,166	10,230
ORE												
East of Marquette												
Marquette to Houghton					168,121	31.84					186,385	171,758
Nestoria to State Line												
Total					168,121	31.84					168,385	171,758
Total Freight and Passenger	166,312	31.50	180,108	34.11	* 193,552	* 36.66	177,990	148,797	182,658	142,239	* 213,148	* 196,476
Total Freight	534,057	101.13	518,398	98.19	* 348,176	* 66.04	572,766	478,803	525,808	409,452	* 389,740	* 357,425
Total Passenger	4,056	0.77	4,861	0.92	9,975	1.88	4,340	3,628	4,927	3,836	11,166	10,230
Total Ore					168,121	31.84					186,385	171,758
Total in Michigan	704,425	133.40	703,367	133.22	720,364	136.42	755,096	531,228	713,393	555,527	800,439	735,889
Added by Mr. Riggs in Exhibit 50.							55,926	105,158				
Modified Total							811,022	736,386				

** Due to a change in the unit prices, the total in 1911 was modified as shown in the Recapitulation. The unit prices used are the same as those used in the 1913 appraisal.

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
SAULT STE. MARIE TO MARQUETTE												
SAULT STE. MARIE: The new passenger station, and all other buildings on the land acquired since 1900 by the Soo Depot Co. treated under "Terminals." The old D., S. S. & A. passenger station, reported in 1900 has been moved and about $1,000 expended upon it. Now in use as Soo Depot Terminal freight office.												
Freight house 22'x62'x16'—frame, shingle roof, 1,364 sq. ft. @ $1.00	Same	Freight house near passenger station included in terminals		1,364	75	1,023	1,364	65	887			
Additions, frame, R. R. R. roof—built 1901—26'x100'x12'—2, 600 sq. ft. @ $1.00	Same	Included in terminals		2,600	85	2,210	2,600	85	2,210			
Freight shed (1897)—1 story frame 26'x80'x9'—tar felt roof—8 windows—1 door—5 freight doors—2,080 sq. ft. @ $1.00	Same	Remeasured—frame building, B. & B. supported on posts, composition roof, 26'x108½'—west 69' used as U. S. Customs office and warehouse—east end used Transfer freight office, 2,821 sq. ft. @ $1.00—$2,821 D., S. S. & A.—½ interest—located St. Mary's Transfer Yard		2,080	80	1,664	2,080	75	1,560			
Transfer office 8'x16'x10' (1896)—128 sq. ft. @ $1.50 per sq. ft.			F.	192	75	144				1,410	80	1,128
Transfer shed (1896) 8'x312'—2,496 sq. ft. @ 30c per sq. ft.		Same, except it is now an open platform in St. Mary's Transfer Yard—$749—½ interest	F.	749	75	562				374	75	280
Platform 12'x62', 34'x200', 8'x100'—8,344 sq. ft. @ 12½c		Platform at Customs Office and Transfer Office, 6'x108', 8'x400', 8'x108'—3" material supported on posts 4' above rail, 4,712 sq. ft. @ 25c—$1,178—½ interest	F.	1,043	75	782						
	Same						1,043	75	782	589	60	353

THIS PAGE BOU
VERTICAL IN E

		Yardmaster's office—B. & B. shingle roof, supported on posts 16′x24′x12′ high—384 sq. ft. @ $1.00—384—½ interest	F.						192	80	153
Omitted	Omitted										
Omitted	Omitted	Water closet 4x6—$30—½ int.	F.						15	50	8
Omitted	Omitted	Water closet 4x6x7—$30—½ int.	F.						15	75	11
Called sleeping car house in shops, engine houses and turntables—Schedule	Same as 1911	Commissary Building, frame, shingle roof ,drop siding, ceiled inside, 16½x28½′x12″ high—470 sq. ft.	P.						940	90	846
BRIMLEY:											
Combination passenger and freight station	Same—16′x50′x12′	Same	F.& P.	1,600	80	1,280	1,600	75	1,200	1,600	80	1,280
Platform, plank, 16′x83′—12′x50′—16′x94′—3,432 sq. ft. @ 12½c	Same	Same	F.& P.	429	80	343	429	80	343	429	80	343
WELLSBURG:												
Passenger depot 14′x15′x13′—210 sq. ft. @ $2.00	Same	Same	P.	420	75	315	420	60	252	420	75	315
Freight depot 12′x15′x8½′—180 sq. ft. @ $1.50 Both frame structure, shingle roof—moved from Soo ,1901	Same	Same	F.	270	75	202	270	60	162	270	75	202
Cinder platform (1900) 8′x85′—680 sq. ft. @ 10c	Same	Same	F.& P.	68	90	61	68	90	61	68	90	61
Old freight house 13′x22′x6′ (1887) B. & B.—268 sq. ft. @ $1.50	Same	Removed		429	50	214	429	50	214			
In Miscellaneous Building Schedule	Telegraph office, frame, shingle roof—9′x9′x7′—81 sq. ft. @ $1.25	Same as 1912	F.& P.				101	80	81	101	80	81
STRONGS:												
Depot 16′x24′x8′—frame building with shingle roof (1899)—384 sq. ft. @ $1.50	Same	Same	F.& P.	576	85	490	576	80	461	576	50	288
Cinder plateform (1899) 8′x38′—304 sq. ft. @ 10c	Same	Same	F.& P.	30	90	27	30	90	27	30	90	27
ECKERMAN:												
Passenger depot, frame, shingle roof, 12′x32′x8′—384 sq. ft. @ $2.00	Same	Same	P.	768	80	614	768	80	614	768	80	614
Old passenger depot, frame with shingle roof, 8′x8′x7′—64 sq. ft. @ $2.00	Omitted	Same as 1911	F.	128	50	64				128	50	64
Freight depot—old box car 8′x32′x8′	Same	Same	F.	133	50	66	133	40	53	133	50	66
Cinder platform with limestone curbing 8′x75′—600 sq. ft. @ 14c	Same	Same	F.& P.	84	90	76	84	90	76	84	90	76

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
SOO JUNCTION:												
Combination passenger and freight station—overhauled and addition built, 1906	Same	Same	F.& P.	2,500	90	2,250	2,500	75	1,875	2,500	90	2,250
Platform 12'x112'—wood (1907) 1,344 sq. ft. @ 12½c	Same	Remeasured Plank 1,600 sq. ft. @ 12½c	F.& P.	168	90	151	168	90	151	200	60	120
		Screenings, 3,060 sq. ft. @ 10c	F.& P.							306	100	306
SAGE:												
Platform (1900) 16'x20'—320 sq. ft. @ 12½c	Same	Same	F.& P.	40	65	26	40	65	26	40	65	26
NEWBERRY:												
Passenger depot 20'x48'x12'—built 1908 of concrete block on concrete foundation—asbestos tile comp. roof—contains waiting room, office, baggage room, two toilets, two ticket windows, etc., coal bin under depot—960 sq. ft. @ $2.50	Same	Same	P.	2,400	95	2,280	2,400	95	2,280	2,400	95	2,280
		Extension made during 1913—estimated	P.							1,000	100	1,000
Platform 12'x64'—768 sq. ft. @ 20c	Same	Same	F. &P.	154	100	154	154	90	139	154	100	154
Freight depot, shingle roof (1881)—rebuilt 1901—22'x48'x13'—1,056 sq. ft. @ $1.00	Same	Station burned 1913—new building 1913—estimated cost	F.	1,056	80	845	1,056	75	792	2,000	100	2,000
Freight platform (1881)—rebuilt 1902—12'x64', 8'x64', 8'x22', 8'x22'—1,632 sq. ft. @ 12½c	Same	Same	F.	204	75	153	204	75	153	204	75	153
DOLLARVILLE:												
Combination passenger and freight depot (1881) frame building, shingle roof, 22'x49'x12'—1,078 sq. ft. @ $1.50	Omitted	Same	F.& P.	1,617	55	889				1,617	55	889
Platform 12'x64', 8'x44' (1902)1,120 sq. ft. @ 12½c	Same	Same	F.& P.	140	75	105	140	75	105	140	50	70
MCMILLAN:												
Depot burned June, 1906—Old building formerly at Matchwood.	Box Car(New Depot under construction)	Station—new 1912—frame 24'x64' ceiled inside, drop siding outside composition roof	F.& P.	400	50	200	133	50	66	1,772	100	1,772
Platform (1902) 8'x77', 8'x77', 8'x44'—1,584 sq. ft. @ $10c	Omitted	Same	F.& P.	158	90	142				158	100	158

LAKETON:												
Cinder platform (1898) assumed 8"x60'—480 sq. ft. @ 10c	Same	Same	F.& P.	48	90	43	48	90	43	48	90	43
None there	Depot—snmall shanty	None here					100	50	50			
DANAHER:												
Wood platform 12'x23'—276 sq. ft. @ 12½c	Same	Same	F.& P.	34	75	26	34	75	26	34	75	26
SENEY:												
Passenger depot, frame building, shingle roof, overhauled 1901—15'x25'x11'—375 sq. ft. @ $2.00	Same	Same	P.	750	80	600	750	60	450	750	80	600
Passenger platform 6'x70'—wood—420 sq. ft. @ 12½c	Same	Same	P.	52	75	39	52	75	39	52	75	39
Freight house 31'x50'x12'—annex 14'x24'x10', 12'x30'x10'—2,246 sq. ft. @ $1.00, frame building with shingle roof	Same	Same	F.	2,246	70	1,572	2,246	70	1,572	2,246	70	1,572
Freight platform—600 sq. ft. @ 12½c	Same	Same	F.	75	70	52	75	70	52	75	70	52
SHINGLETON:												
Depot 22'x65'x12'—1, 430 sq. ft.—frame building, shingle roof—1,430 sq. ft. @ $1.50	Same	Same	F.& P.	1,072	80	858	1,072	80	858	1,072	80	858
2,145 sq. ft.—½ interest with M. & N. W.												
Platform, wood, 8'x89', 10'x89' 12'x44', 9'x121' —3,220 sq. ft. @ 12½c—$402 ½ interest	Same	Same	F.& P.	201	75	151	201	60	121	201	75	151
Platform—Cinders with limestone curbing—built 1909—6'x112'—672 sq. ft. @ 14c	Same	Same	F. &P.	94	100	94	94	95	89	94	100	94
WETMORE:												
Passenger depot—built 1881—frame building, shingle roof, 15'x25'x20'—375 sq. ft. @ $2.00	Same	Same	P.	750	55	412	750	50	375	750	55	412
Passenger platform (1900)—assumed to be 6'x70' —420 sq. ft. @ 12½c	Same	New inventory, limestone screenings, 10'x100'—1,000 sq. ft. @ 12½c	P.	52	70	36	52	70	36	125	70	88
Freight house—frame building—shingle roof, 20'x26'x12'—520 sq. ft. @ $1.50	Same	Same	F.	780	60	468	780	50	390	780	60	468
Freight platform—12'x150' and 8'x30' (1909)—2,040 sq. ft. @ 12½c	Same	Same	F.	255	65	166	255	65	166	255	65	166

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
MUNISING JUNCTION												
Combintation freight and passenger depot—frame building, shingle roof (1897)—18'x23'-x9½'—414 sq. ft. @ $1.50—$621 ½ interest	Same	Same	F.& P.	310	80	248	310	60	186	310	80	248
Platform wood 7'x148', 6½'x148', 9'x12', 6'x64', 1897—2,490 sq. ft. @ 12½c	Same except ½ interest	Same except 2,490 ft. @ 12½c=$311—½ interest	F.& P.	311	50	156	311	50	156	156	50	78
AU TRAIN:												
Depot, frame, shingle roof, built 1881—overhauled 1901—15'x25'x12'—375 sq. ft. @ $2.00	Same	Same	F.& P.	750	80	600	750	70	525	750	80	600
Platform—wood—built 1902—16'x36', 5½'x46', 12'x61'—1,561 sq. ft. @ 12½c	Same	Same	F.& P.	195	70	136	195	70	136	195	70	136
ROCK RIVER:												
Platform—cinders—8'x80'—640 sq. ft. @ 10c (1903)	Same	Same	F.& P.	64	90	58	64	90	58	64	90	58
Freight depot 8'x16'x8'—rebuilt in 1910—128 sq. ft.	Omitted	Same	F.& P.	192	100	192				192	75	144
ONOTA:												
Platform (1894)—12'x105'—1,260 sq. ft. @ 12½c	Same	Same	F.& P.	158	50	79	158	50	79	158	50	79
DEERTON:												
Depot, frame, shingle roof, complete general repairs in 1904—15'x25'x12'—375 sq. ft. @ $2.00	Same	Same	F.& P.	750	85	638	750	80	600	750	85	638
Cinder platform—built 1904—8'x60'—480 sq. ft. @ 10c	Same	Same	F.& P.	48	90	43	48	90	43	48	50	24
WHITEFISH:												
Platform, cinder, built 1898—5'x60'—300 sq. ft. @ 10c.	Same	Same	F.& P.	30	90	27	30	90	27	30	90	27

SAND RIVER:												
Depot and pump house—burned 1907 and rebuilt—14½'x26½'x13'—384 sq. ft. @ $1.50	Same (1902)	Same	F.& P.	576	95	547	576	85	490	576	95	547
Platform (1907)—10'x27'—270 sq. ft. @ 12½c	Same (1902)	Same	F.& P.	34	90	31	34	90	31	34	90	31
GORDON:												
Cinder platform (1893)—assumed 480 sq. ft. @ 10c	Same	Same	F.& P.	48	90	43	48	90	43	48	90	43
CHOCOLAY:												
Portable depot, open front—built 1909—9'x16'-x7'—144 sq. ft. @ $1.25	Same	Same—144 sq. ft. @ 50c	F.& P.	180	100	180	180	95	171	72	90	65
Cinder platform (1909)—10'x100'—1,000 sq. ft. @ 10c	Same	Same	F.& P.	100	100	100	100	100	100	100	95	95
		Total								30,598		24,756
		Total Freight and Passenger								14,707		11,886
		Total Freight								8,686		6,676
		Total Passenger								7,205		6,194
		Ore, None										
	Total Sault Ste. Marie	to Marquette		31,955		24,927	28,853		21,482	30,598		24,756
ST. IGNACE TO SOO JUNCTION												
ST. IGNACE:												
Passenger depot—frame and shingle roof, 1887—21½'x53'x14½',12'x12'x9', 14'x14'x11½'—1,480 sq. ft. @ $2.00	Same	Same	P.	2,960	65	1,924	2,960	65	1,924	2,960	65	1,924
Freight station—frame, shingle roof—1881—new roof and siding (1903)												
Freight office 31'x56'x14'—Shed 31'x97'x14'—house 31'x219'x14'—Shed 31'x56'x14'—13,268 sq. ft. @ $1.00—(Frame, shingle roof, 1881, new roof and siding 1903)	Same	Same	F.	13,268	80	10,614	13,268	70	9,288	13,268	80	10,614
		Platform—concrete, 3,000 sq. ft. @ 15c	P.							450	100	450
ALLENVILLE:												
Passenger depot—open face—Carey roof (1907) 10'x16'x8'—160 sq. ft. @ $1.25	Same	Same except 160 sq. ft. @ 50c	F.& P.	200	90	180	200	90	180	80	90	72
Platform—gravel (1899)—8'x54'—432 sq. ft. @ 10c	Same	Same	F.& P.	43	90	39	43	90	39	43	90	39

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
MORAN:												
Passenger depot—frame building, shingle roof (1881) 16'x25'x11'—400 sq. ft. @ $1.50	Same	Same	F.& P.	600	50	300	600	50	300	600	50	300
Platform—gravel 8'x69'—552 sq. ft. @ $10c	Same	Same	F.& P.	55	90	50	55	90	50	55	90	50
KENNETH:												
Platform—gravel 8'x66'—528 sq. ft. @ 10c	Same	Same	F.& P.	53	90	48	53	90	48	53	90	48
OZARK:												
Depot—old box car (8'x30'x6')	Same	Same	F.& P.	133	50	66	133	50	166	133	50	66
Platform—gravel 8'x50'—400 sq. ft. @ 10c	Same	Same	F.& P.	40	90	36	40	90	36	40	90	36
TROUT LAKE:												
Passenger station—frame building, shingle roof, 38'x20'x20'—760 sq. ft. @ $2.00 $1,520—½ interest	Same	Same—Living rooms upstairs for agent Remeasured Annex 18'x30'x12', 18'x30'x12', 18'x30'x12' - 1,620 sq. ft. @ $1.00 —½ interest	F.& P.	760	70	532	760	70	532	760	70	532
Annex—open shed, 18'x30'x11'—540 sq. ft. @ 50c—$270—½ interest	Same	New data—Screenings 200'x12'—2,400 sq. ft. @ 10c along D., S. S. & A. track	F.& P.	135	70	94	135	70	94	810	80	648
Platform 12'x300 (1887), 12'x190' (1907)—5,880 sq. ft. @ 12½c	Same	Plank, 1,984 sq. ft. in front of building, D., S. S. & A. track	F.& P.	735	60	441	735	60	441	240	100	240
			F.& P.							248	60	150
FIBORN:												
Depot—old box car	Same	Same	F.& P.	133	50	66	133	50	66	133	50	66
HENDRIE:												
Platform—cinders, 8'x60'—480 sq. ft. @ 10c	Same	Same	F.& P.	48	90	43	48	90	43	48	90	43
		Total								19,921		15,278

		Total Freight and Passenger									13,268		10,614
		Total Freight									3,410		2,374
		Total Passenger											
		Ore—None											
	Total St. Ignace to Soo	Junction		19,163		14,433	19,163		13,107	19,921		15,278	
		Total S. S. Marie to Marquette		31,955		24,927	28,853		21,482	30,596		24,756	
	Total East of Marquette			51,118		39,360	48,016		34,589	50,519		40,034	
MARQUETTE TO NESTORIA													
MARQUETTE:													
Passenger depot—105.67'x35.67'x24'—two stories basement at one end—18'x35.67'—underground coal bin 12½'x25' outside of building. Building of red sand stone (Superior) veneer with brick walls—slate roof—3,769 sq. ft. @ $7.00	Same, except no unit cost	Same	P.	26,383	95	25,064	26,000	90	23,400	26,383	95	25,064	
Passenger platform—3,600 sq. ft.—cement @ 20c	Same	New data—cement, 7,180 sq. ft. @ 15c	P.	720	95	684	720	90	648	1,077	100	1,077	
		Wood, 7,390 sq. ft. @ 12½c	P.							924	50	462	
Sidewalks, paved driveways, fencing and miscellaneous outside improvements on grounds	Same	Same	P.	1,500	95	1,425	1,500	80	1,200	500	90	450	
Freight house—frame—shingle roof (1881)—30'x102'x12'—3,060 sq. ft. @ $1.00	Same	Omitted—not in use		3,060	50	1,530	3,060	50	1,530				
Platform—wood—1,800 sq. ft. @ 12½c	Same	Omitted—not in use		225	50	112	225	50	112				
None there	Freight office, lower yard—16'x63'x15', frame, 1,008 sq. ft. @ $1.00	None there					1,008	50	504				
New	New	Station new at corner 3rd St. and tracks, brick 40'x130'—prepared roofing, 8" walls and 13" pilasters, steel roof trusses, concrete floor and foundation, hot water heating plant, electric light in building and on platform. Platform 10'x250', wood—total actual cost	F.							8,291	100	8,291

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
SOUTH EAGLE MILLS:												
Platform—cinder (1892) 5½'x60'—330 sq. ft.	Same	Non Railway use		33	90	30	33	90	30			
NEGAUNEE:												
Depot—1910—one story—pressed brick building 112'x22'x14' asbestos shingle roof—overhangs 8 feet. contains Women's waiting room 15½'x21'—women's toilet with 2 stools and basin—Men's toilet has 1 stool and 1 urinal. General waiting room 53'x15'. Baggage room 21'x20'—Western Express 17'x11'—American Express 17'x11'—Concrete floors reinforced—excavated for basement 26'x22'x9'—furnace room—steam heated—large boiler—29 windows—9 single doors—4 double doors. Waiting room and offices have tiled floors. 2,464 sq. ft. @ $6.50—$16,016—½ interest	Same—$17,000—½ int.	Same as 1911	P.	8,008	100	8,008	8,500	100	8,500	8,008	100	8,008
Passenger platform (1911)—concrete—average 7" thick—14'x145' and 10'x227'—4,300 sq. ft.—22'x78', 20'x10', 15'x20', 21'x25', 23'x19' 3,178 sq. ft.—7, 478 sq. ft. @ 20c—$1,516—½ interest	Same	Same	P.	748	100	748	748	100	748	748	100	748
Freight depot—old passenger station—frame building, shingle roof—22½'x93'—2,092 sq. ft. @ $1.00	Sold	Sold		2,092	50	1,046						
Platform—wood—930 sq. ft. @ 12½c	Same	Taken up		116	50	58	116	50	58			
This building was moved from south side of track in 1912.	Freight depot, old M. & W. passenger and freight depot, 1884—30'x90', slate roof, rebuilt with concrete foundations, steam heat, 1912—2,700 sq. ft. @ $1.25	Station included, local freight office and American Express office—frame, concrete foundations and wood plat forms, 22'x90'—1,980 sq. ft. @ 2.00	F.				3,375	70	2,362	3,960	80	3,168

THIS PAGE BOU
VERTICAL IN E

SOUTH ISHPEMING:		Telegraph office, 1881—26'x13'x13											
Omitted	Omitted	338 sq. ft. @ $1.25	O.								422	50	211
Omitted	Omitted	Toilet—4'x5'x7'—1881	O.								30	50	15
NORTH ISHPEMING:													
Passenger depot—frame building, slate roof—built 1881—two toilet rooms added 1905—24'x64'x15'—1,536 sq. ft. @ $2.00	Same	Same	P.	3,072	55	1,690	3,072	55	1,690	3,072	55	1,690	
Passenger platform—built 1904—13'x76', 16'x76', 21'x76', 12'x24', 16'x38', 20'x38'—3,670 sq. ft. @ 12½c	Same	Same except @ 25c	P.	459	75	344	459	60	275	918	75	688	
Freight depot—frame, shingle roof, built 1881—30'x78½'x16½'—2,355 sq. ft. @ $1.00	Same	Same	F.	2,355	55	1,295	2,355	55	1,295	2,355	55	1,295	
Freight platform—built 1904—12'x126', 13'x126', 28'x30', 19'x30'—4,560 sq. ft. @ 12½c	Same	Same except @ 25c	F.	570	75	428	570	75	428	1,140	75	855	
In Miscellaneous Buildings	In Miscellaneous Buildings	Freight Transfer shed 11'x288'—3,168 sq. ft. @ $1.00—$3,168—½ interest	F.							1,584	75	1,188	
In Miscellaneous Buildings	In Miscellaneous Buildings	Freight transfer check house (1896) 10'x11'x10'—110 sq. ft. @ $1.25 $138—½ interest	F.							69	75	52	
STONEVILLE:													
Platform—cinders—built 1893—estimated 480 sq. ft.	Same	Same	F.& P.	48	90	43	48	90	43	48	90	43	
GREENWOOD:													
Platform—cinder—built 1881—8'x90'—720 sq.f.	Same	Same	F.& P.	72	90	65	72	90	65	72	90	65	
LOW MOOR:													
Platform—cinder—built 1897—8'x32—256 sq. ft.	Same	Same	F.& P.	26	90	23	26	90	23	26	90	23	
CLARKSBURG:													
Depot—moved from Summit 1910—12'x20'x10'—240 sq. ft. @ $1.50	Same	Same	F.& P.	360	80	288	360	80	288	360	80	288	
Platform—cinder—built 1902—8'x61'—488 sq. ft. @ 10c	Same	Same	F.& P.	49	90	44	49	90	44	49	90	44	
HUMBOLDT:													
Depot—frame and shingle roof—2 story—general repairs—1907—20½'x40½'—830 sq. ft. @ $2.50	Same	Same	F.& P.	2,075	80	1,660	2,075	80	1,660	2,075	80	1,660	

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
Passenger platform—built 1902—12'x58', 4'x58', 6'x20', 12'x20', 24'x48'—2,440 sq. ft. @ 12½c	Same	Same	F.& P.	305	70	214	305	70	214	305	70	214
REPUBLIC:												
Depot—1 story frame building—drop siding—Carey roof—9 windows—3 single doors—2 sliding freight doors—2 stoves—concrete flooring—2 ticket windows—building contains freight house, office and waiting room 40'x16'x13'—640 sq. ft. @ $1.50	Same	Same	F.& P.	960	100	960	960	90	864	960	95	912
Cinder platform—10'x74', 5'x74'—1,110 sq. ft. @ 10c.	Same	Same	F.& P.	111	100	111	111	100	111	111	95	105
CHAMPION:												
Passenger depot—1887—frame, shingle roof—painted 1906—16'x16x10½', 14'x20'x10½', 24'x52'x12'—1,784 sq. ft. @ $2.00	Same except ½ interest	Same	P.	1,784	60	1,070	1,784	60	1,070	3,568	60	2,141
Passenger platform (wood) 1902—12'x84', 12'x24', 20'x24', 12'x94', 12'x84'—3,912 sq. ft. @ 12½c	Same	Same	P.	489	70	342	489	70	342	489	70	342
Freight depot—frame, shingle roof—1865—new roof 1906—26'x87'x12'—2,262 sq. ft. @ $1.00	Same	Same	F.	2,262	50	1,131	2,262	50	1,131	2,262	50	1,131
Freight platform—1902—13'x122', 12'x26', 8'x 26'—2,106 sq. ft. wood @ 12½c	Same	Same	F.	263	75	197	263	75	197	263	75	197
In Miscellaneous Buildings	In Miscellaneous Buildings	Express office (1887), frame, shingle roof, 14'x20'x11'—280 sq. ft. @ $2.00	P.							560	50	280
MICHIGAMME:												
Depot—frame, comp. roof—one story lap-siding —11windows—1 ticket window—3 doors—2sliding doors—built 1899—20'x65'x12' —1,300sq. ft. @ $1.50	Same	Same	F.& P.	1,950	80	1,560	1,950	80	1,560	1,950	80	1,560
Platform—16'x90', 8'x32', 8'x20', 12'x108', 7'x 32'—3,376 sq. ft. wood @ 12½c	Same	Same	F.& P.	422	75	316	422	75	316	422	75	316

BEAUFORT:												
Depot—open face—built 1909	Same	Same 9'x16'x7'—144 sq. ft. @ 50c	F.& P.	180	90	162	180	90	162	72	90	65
Platform—cinder—estimated 480 sq. ft. @ 10c	Same	Same	F.& P.	48	90	43	48	90	43	48	90	43
THREE LAKES:												
Depot—Open face	Same	Same—9'x16'x7'—144 sq. ft. @50c	F.& P.	180	90	162	180	90	162	72	90	65
Platform—7½'x33'—built 1890—247 sq. ft. @ 10c.	Same	Same	F.& P.	25	90	22	25	90	22	25	90	22
NESTORIA:												
Passenger depot—one story—frame building—built 1904—20 ft. to peak of roof—4 rooms—7 single doors—2 double swing doors—14 windows—3 ticket windows—tapped siding—maple flooring—56'x24'x12'—1,344 sq. ft. @ $2.00	Burned 1912—new passenger depot—one story—frame building—concrete foundation — built 1912—75'x24'x16'—1800 sq. ft. @ $2.50	Same as 1912—comp. shingle roof, waiting rooms, baggage room, offices, lunch room and kitchen in east end. Boiler in baggage 2 waiting rooms 17x'24' each, office 10'x24'—baggage room 16' x24'—lunch room and kitchen 14'x24'	P.	2,688	90	2,419	4,500	100	4,500	4,000	100	4,000
Platform—2" plank—12'x40' and 21'x40'—1,320 sq. ft. @ 12½c	Platform concrete—6,000 sq. ft.	Platform concrete—5,500 sq. ft. concrete curb 3'x8'—160'	P.	165	90	148	1,000	100	1,000	1,264	100	1,264
Freight house—frame, shingle roof—built 1903—16'x32'x11'—512 sq. ft. @ $1.50	Same	Same	F.	768	85	653	768	85	653	768	85	653
Platform—cinder—built in 1900—8'x192'—1,536 sq. ft. @ 10c	Same	Replaced by concrete platform shown above		154	90	139	154	90	139			
		Total								79,250		68,695
		Allocated in 1913										
		Freight and Passenger								6,595		5,425
		Freight								20,692		16,830
		Passenger								51,511		46,214
		Ore								452		226
	Total Marquette to Nestoria			64,725		54,234	69,772		57,389	79,250		68,695
NESTORIA TO HOUGHTON												
HERMAN:	Depot—Old nestoria lunch room—12'x24'x9'	Same as 1912, fitted with windows etc.—12'x24'x9'—288 sq. ft. @ $2.00	F.& P.				500	70	350	576	90	508
Moved in 1912												
Depot—box car body	Freight house	Removed		133	50	66	133	50	66			
Cinder platform—8'x50'—400 sq. ft. @ 10c	Same	Same	F.& P.	40	90	36	40	90	36	40	90	36

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911			1912			1913		
				C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				$		$	$		$	$		$
L'ANSE:												
Depot—2 stories high—shingle roof—built 1906—20'x56'—1,120 sq .ft. @ $2.50	Same	Same	F.& P.	2,800	90	2,520	2,800	90	2,520	2,800	90	2,520
Platform—built 1907—2" plank—11'x88'—968 sq. ft. @ 12½c	Same	Same	F.& P.	121	90	109	121	90	109	121	90	109
BARAGA:												
Depot—frame, shingle roof, built 1892—20'x64'x12'—1,280 sq. ft. @ $1.50	Same	Same	F.& P.	1,920	75	1,440	1,920	70	1,344	1,920	75	1,440
Platform—wood—rebuilt 1902—16'x72', 8'x20'10'x205'—3,362 sq. ft. @ 12½c	Same	Same	F.& P.	420	70	294	420	70	294	420	70	294
MISSION:	ASSININ:	MISSION:										
Platform—cinders—built 1904—7½'x60, 8'x16'—578 sq. ft. @ 10c	Platform— cinders —built 1904—7½'x160'—450 sq. ft @ 10c	Same as 1911	F.& P.	58	90	52	45	80	36	58	90	52
Fish platform—built 1900—8'x16'x4½'—128 sq. ft. @ 25c	Same	Same	F.& P.	32	85	27	32	85	27	32	85	27
KEWEENAW BAY:												
Depot 24'x56'x16'—built 1899—two story frame building—1st floor contains freight room 24'x24'—waiting room 16'x24'—office 12'x30'—2nd floor, 7 rooms, pantry, hall and three closets—26 windows—18 doors—2 sliding freight doors—2 ticket windows—composition roof—1,344 sq. ft. @ $2.50—$3,360—½ int.	Same	Same	F.& P.	1,680	80	1,344	1,680	80	1,344	1,680	80	1,344
Platform—wood—2" plank—1899-1904—10'x48', 20'x20', 24'x56'—2,224 sq. ft. @ 12½c	Same	Same—½ interest	F.& P.	278	75	208	278	75	208	139	75	104
NEWTON:												
Platform—cinder—built 1904—8'x75'—600 sq. ft.	Same	Same	F.& P.	60	90	54	60	90	54	60	90	54

ARNHEIM:												
Depot—Open face—built 1909.	Same	Same—9'x16'x7'—144 sq. ft. @50c	F.& P.	180	95	171	180	95	171	72	95	68
Platform—cinder—built 1900	Same	Same	F.& P.	48	90	43	48	90	43	48	90	43
CHASSELL:												
Depot—frame, shingle roof (1893)—20'x64'x12'—1,280 sq. ft. @ $1.50	Same	Same	F.& P.	1,920	75	1,440	1,920	75	1,440	1,920	75	1,440
Platform—built 1904—16'x84', 20'x20', 16'x82'—3,056 sq. ft. @ 12½c	Same	Same	F.& P.	382	75	286	382	75	286	382	75	286
PILGRIM:												
Platform—sand—built 1907—8'x80'—640 sq. ft. @ 10c	Same	Same	F.& P.	64	90	58	64	90	58	64	90	58
HOUGHTON:												
Freight house—frame, shingle roof, 1883—20'x108'x13'—2,160 sq. ft. @ $1.00	Same except 22'x141'x13'—3,102 sq. ft. @ $1.00	Same	F.	2,160	55	1,188	3,102	60	1,861	2,160	55	1,188
Platform—wood—built 1883—21'x138', 30'x20'3,498 sq. ft. @ 12½c	Same	Same	F.	437	50	218	437	50	218	437	50	218
Transfer platform—wood—(1892)—18'x134'—2,412 sq. ft. @ 25c	Same except 7'x441', 30'x32,'—3,747 sq. ft. @ 25c		F.	603	50	302	937	50	468	603	50	302
Transfer shed—13'x256'x8'—with 12' platform—3,328 sq. ft. @ 30c	Same		F.	998	85	848	998	85	848	998	85	848
		Total								14,530		10,939
		Total Freight and Passenger								10,332		8,383
		Total Freight								4,198		2,556
		Total Passenger—None										
		Total Ore—None										
	Total Nestoria to Houghton			14,334		10,704	6,097		11,781	14,530		10,939
		Total Marquette to Nestoria		64,725		54,234	69,772		57,389	79,250		68,695
	Total Marquette to Houghton			79,059		64,938	85,869		69,170	93,780		79,634
NESTORIA TO STATE LINE												
VERMILAC:												
Platform, cinders 8'x50' (1900)—400 sq. ft. @ 10c	Same	Same	F.& P.	40	90	36	40	90	36	40	90	36

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
MURPHY:				$		$	$		$	$		$
Platform—cinders (1900)—8'x48'—384 sq. ft. @ 10c	Same	Same	F.& P.	38	90	34	38	90	34	38	90	34
Office—frame, shingle roof—9'x9'x7'—81 sq. ft.	Same		F.& P.	121	90	109	121	90	109	121	90	109
COVINGTON:												
Depot (1900) two story cement block building with freight house attached—20'x34'x17'—1st floor, office, waiting room and express—2nd floor, 2 bed rooms, kitchen, hall ,pantry, living and dining rooms—stove heat—16 windows—15 doors and 1 ticket window—Carey roof. Freight house attached—1 story 20'x22'x9'—2 sliding doors—1,120 sq. ft. all taken at an average of $2.50	Same	Same	F.& P.	2,800	100	2,800	2,800	100	2,800	2,800	95	2,660
Platform—limestone screenings—cinder 1911—12'x60'—720 sq. ft. @ 10c	Same except 720 sq. ft. @ 15c	Same	F.& P.	72	100	72	108	90	97	72	95	68
WATTON:												
Omitted	Platform — screenings — 8'x40'—320 sq. ft. @ 10c	Platform—cinder	F.& P.				32	80	26	25	75	19
PERCH:												
Platform—cinder (1900) 8'x50'—400 sq. ft. @ 10c	Same	Same	F.& P.	40	90	36	40	90	36	40	90	36
SIDNAW:												
Depot—frame—high class, canopy shed 30 ft. on west end (1908-1910)—25'x90'—cement platform 12'x200' on D., S. S. & A. side—maple floors—western fir finish mantels—hot water heat—thoroughly modern and up-to-date, $7,000	Same	Same	F.& P.	3,375	100	3,365	3,375	95	3,206	3,375	95	3,206
2,250 sq. ft. building @ $3.00—$6,750—½ int.				480	100	480	480	100	480	480	95	456
2,400 sq. ft. platform @ 20c												
Transfer shed, shingle roof (1895)—10'x16', 160'x7'—2,080 sq. ft. @ 30c—⅓ interest	Same	Same	F.	312	90	281	312	90	281	312	90	281

KITCHIE:												
Passenger depot—frame, shingle roof (1892)—16′x24′x12′—384 sq. ft. @ $2.00	Omitted	Same	F.& P.	768	70	538				768	50	384
Platform —wood—11′x59′—649 sq. ft.	Same except screenings	Same as 1911	F.& P.	81	50	40	97	70	68	81	50	40
KENTON:												
Depot—frame, shingle roof (1892)—16′x18′x10′, 16′x16′x10′, 13′x21′x14′—817 sq. ft. @ $1.50	Same	Same	F.& P.	1,225	70	858	1,225	70	858	1,225	70	858
Platform (1898)—12′x63′—756 sq. ft. @ 12½c	Same	Same	F.& P.	94	55	52	94	55	52	94	55	52
TROUT CREEK:												
Depot—frame, shingle roof—built 1890, painted 1909—30′x34′x12′—1,020 sq. ft. @ $1.50	Same	Same	F.& P.	1,530	70	1,071	1,530	70	1,071	1,530	70	1,071
Platform—14′x145′—2,030 sq. ft. limestone screenings.	Same	Same	F.& P.	254	50	127	254	50	127	254	50	127
AGATE:												
Depot— R. & B. roof (1900)—6′x12′x6′—72 sq. ft. @ $1.50	Omitted	Same	F.& P.	108	85	92				108	85	92
Platform—cinders—8′x50′—400 sq. ft. @ 10c	Same	Same	F.& P.	40	90	36	40	90	36	40	90	36
FALLS:												
Platform—cinder (1900)—8′x50′—400 sq. ft. @ 10c	Same	Same	F.& P.	40	90	36	40	90	36	40	90	36
PAYNESVILLE:												
Depot (1911)—two story concrete block building with freight house attached—building 22′x36′x17′-8″—1st floor, office and waiting rooms—2nd floor, 2 bedrooms, living room, kitchen and pantry, hall and two closets—16 windows, 13 doors, 1 counter. Freight house attached is 22′x20′-6″—2 sliding doors—composition roof—792 sq. ft.—2 story—451 sq. ft., 1 story—1,243 sq. ft. @ $2.50	Same	Same	F.& P.	3,107	100	3,107	3,000	100	3,000	3,108	95	2,953
Platform—wood (1895)—8′x52′—416 sq. ft. @ 12½c	Screenings with concrete curb 8′x52′—800 sq. ft. @ 15c	Platform—limestone screenings with concrete curb 8′x125′—1,000 sq. ft. @ 15c	F.& P.	52	50	26	120	100	120	150	95	142
GEM:												
Omitted	Omitted	Station is half of a box car	F.& P.							70	70	49

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
BRUCE'S CROSSING:												
Depot—frame, shingle roof (1888)—20'x40'x12' 800 sq. ft. @ $1.50	Same	Same	F.& P.	1,200	60	720	1,200	60	720	1,200	60	720
Platform—cinders (1903)—12'x75'—900 sq. ft. @ 10c	Same	Same	F.& P.	90	90	81	90	90	81	90	90	81
BALTIMORE:												
Depot—frame, shingle roof (1903)—9'x9'x7' 81 sq. ft. @ $1.50	Same	Should be telegraph office—81 sq. ft. @ $70	F.& P.	122	80	110	122	90	110	57	90	51
Omitted	*Omitted*	Platform—plank	F.& P.							25	90	22
EWEN:												
Depot—frame, shingle roof (1891)—general repairs 1902—20'x96'x12'—1,920 sq. ft. @ 1.50.	Same	Same	F.& P.	2,880	75	2,160	2,880	70	2,016	2,880	75	2,160
Platform—wood (1902)—16'x110', 14'x20'—2,040 sq. ft. @ 12½c	Same	Same	F.& P.	255	70	178	255	60	153	255	70	178
MATCHWOOD:												
Depot—1 story frame building—flat roof R. R. R. (1905)—5 windows, 3 doors, 2 sliding doors, 2 stores, sides B. & B.—12'x48'x10'—576 sq. ft. @ $1.00	Same	Same	F.& P.	576	80	461	576	80	461	576	80	461
Platform—wood (1904)—14'x87'—1,218 sq. ft. @ 12½c	Same	Same	F.& P.	152	75	114	152	75	114	152	75	114
GROESBECK:												
Platform—cinder (1901)—estimated 400 sq. ft. @ 10c	Same	Same	F.& P.	40	90	36	40	90	36	40	90	36
TOPAZ:												
Depot—12'x14'x7'—built 1905—addition 12'x 20'x8'—built 1910—comp. roof—408 sq. ft. @ $1.50	Same	Same	F.& P.	612	85	520	612	85	520	612	85	520
Platform—cinder—estimated 480 sq. ft. @ 10c	Same	Same except wood @ 12½c	F. &P.	48	90	43	48	90	43	60	90	54

THIS PAGE BOU
VERTICAL IN

BERGLAND:												
Depot—frame, shingle roof (1902)—16′x60′x12′—960 sq. ft. @ $1.50	Same	Same	F.& P.	1,440	85	1,224	1,440	75	1,080	1,440	85	1,224
Platform—12′x80′ and 12′x16′—1,152 sq. ft. @ 12½c	Same	Same	F.& P.	144	70	101	144	70	101	144	70	101
LAKE GOGEBIC:												
Depot—frame, shingle roof—built 1893—new chimney 1902—12′x24′x12′—288 sq. ft. @ $2.00	Same	Same	F.& P.	576	75	432	576	70	403	576	75	432
Platform (1905)—16′x24′, 8′x32′, 8′x8′, 12′x64′—1,472 sq. ft. @ 12½c	Same	Same	F.& P.	184	80	147	184	80	147	184	80	147
Dining hall (1898)—frame, shingle roof—24′x32′x12′—768 sq. ft. @ $1.50	Same	Same	P.	1,152	80	922	1,152	80	922	1,152	80	922
TULA:												
Platform—cinders (1910)—8′x50′—400 sq. ft. @ 10c	Same	Same	F.& P.	40	90	36	40	90	36	40	90	36
THOMASTON:												
	Same—built 1887—rebuilt											
Passenger station—20′x50′—1,000 sq. ft. @ $2	1903	Same	P.	2,000	90	1,800	2,000	80	1,600	2,000	90	1,800
Passenger platform—2,000 sq. ft. @ 12½c	Same	Same	P.	250	75	188	250	75	188	250	75	188
Included in Miscellaneous Buildings	In Miscellaneous Bldgs.	Freight house—frame 14′x24′x12′—336 sq. ft. @ $1.00	F.							336	90	302
ABITOSSE:												
Platform—cinders (1900)—8′x50′—400 sq. ft. @ 10c	Same	Same	F.& P.	40	90	36	40	90	36	40	90	36
BESSEMER:												
Depot—frame, shingle roof (1887)—20′x61′x14′—1,220 sq. ft. @ $1.50	Same	Same	F.& P.	1,830	60	1,098	1,830	60	1,098	1,830	60	1,098
Platform (1904)—12′x27′, 8′x20′, 8′x50′, 16′x20′, 8′x77′—2,420 sq. ft. @ 12½c	Same	Same	F.& P.	302	75	226	302	75	226	302	75	226
NORTH BESSEMER:												
Depot—frame with iron roof (1901)—7′x31′x9′—217 sq. ft. @ $1.00	Depot—old box car	Same as 1912	F.& P.	217	85	184	150	50	75	150	50	75
Platform—cinder (1904)—6′x48′—288 sq. ft. @ 10c	Same	Same	F.& P.	29	90	26	29	90	26	29	90	26

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
MONTREAL:				$		$	$		$	$		$
Platform—logs (1900)—8'x50'—400 sq. ft. @ 12½c	Cinder—8'x50'—400 sq. ft. @ 10c	Same as 1911	F.& P.	50	90	45	40	90	36	50	90	45
		Total								29,241		23,800
		Total Freight and Passenger								25,191		20,307
		Total Freight								648		583
		Total Passenger								3,402		2,910
		Ore—None										
	Total Nestoria to State Line			28,806		24,094	27,898		22,701	29,241		23,800

RECAPITULATION STATION BUILDINGS and FIXTURES

DIVISION	1911 C. R.	1911 P. V.	1912 C. R.	1912 P. V.	1913 C. R.	1913 P. V.
	$	$	$	$	$	$
Sault Ste. Marie to Marquette	31,955	24,927	28,853	21,482	30,598	24,756
St. Ignace to Soo Junction	19,163	14,433	19,163	13,107	19,921	15,278
Marquette to Nestoria	64,725	54,234	69,772	57,389	79,250	68,695
Nestoria to Houghton	14,334	10,704	16,097	11,781	14,530	10,939
Nestoria to State Line	28,806	24,094	27,898	22,701	29,241	23,800
Total in Michigan	158,983	128,392	161,783	126,460	173,540	143,468

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1—A		1911			1912			1913		
			Allocation	C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				$		$	$		$	$		$
EAST OF MARQUETTE		Note:—All shops are joint with Soo Line.										
SAULT STE. MARIE:												
Brick roundhouse—16 stalls—each 12' and 25'x x65'x20'—slate roof—16 stalls @ $1,800	Same	Replaced by new engine house, given below		28,800	80	23,040	28,800	75	21,600			
Steel turntable—concrete pit—70 ft. long, constructed 1907	Same	Same	F.& P.	4,200	95	3,990	4,200	90	3,780	4,200	95	3,990
Clinker pit—4'x83'x3'—stone wall, rail carried on 12"x12" timber—83 lin. ft. @ $5.00	Same	Replaced by new cinder pit given below		415	50	208	415	50	208			
Sand house—old box car—9'x32'x9'—288 sq. ft.	Same—built 1904	Replaced by new sand house given below		144	50	72	144	50	72			
Lamp house—frame, shingle roof, built 1899—9'x9'x7'—81 sq. ft. @ $1.50	Same	Not there		120	80	96	122	80	98			
Scales—Standard track, 1901—36 ft. @ $35.00 per lin. ft.	Same	Transferred to miscellaneous building schedule		1,260	90	1,134	1,260	80	1,008			
Car repair house—no record as to size—1908	Same	Can't identify		200	95	190	200	95	190			
Sleeping car house, frame, shingle roof (1902)—28'x16'x12'—448 sq. ft. @ $1.50	Same	See commissary bldg. in station buildings schedule		672	85	571	672	80	538			
Car repair tool house—frame, Carey roof, built 1908—16'x20'x10'—320 sq. ft. @ $1.50	Same	Car repair store house, frame, same size, shingle roof, 320 sq. ft. @ $1.00	F.& P.	480	95	456	480	90	432	320	50	160
Car repair store house—B. & B., built 1895—8'x12'x6'—96 sq. ft. @ $1.50	Same	Same except called carsmith shop	F.& P.	144	70	101	144	70	101	144	70	101
Built 1912-1913	Built 1912-1913	Engine house, 1912-1913—frame, brick veneer inside, composition roof, concrete foundations and pits, cinder floors—12 stalls, 15' wide front—80' long—25' wide rear—front wall 22'—rear wall 20' high—actual cost	F.& P.							22,046	100	22,046
Omitted	Omitted	Car repair tool house—15'x20'x14'—300 sq. ft. @ $1.50	F.& P.							450	50	225
Omitted	Omitted	Box car tool house	F.& P.							144	75	108
Omitted	Omitted	Box car tool house for car repairs	F.& P.							144	75	108

THIS PAGE BOUN
VERTICAL IN BO

Omitted	Omitted	120 sq. ft. @ $1.50	F.& P.								180	50		90
Omitted	Omitted	Car repairers office—old car body	F.& P.								144	75		108
Omitted	Omitted	Old car house—14'x14'—196 sq. ft. @ $1.00	F.& P.								196	25		49
Omitted	Omitted	Car repairer store house—B. & B. shingle roof—15'x30'—450 sq .ft. @ $1.00	F.& P.								450	75		338
Built 1912-1913	Built 1912-1913	Boiler house, 1912-1913—frame, drop siding, concrete foundations, comp. roof, 36'x48'x22' high—1,728 sq. ft. —actual cost	F.& P.								3,500	100		3,500
Built 1912	Built 1912	Oil house, 1912—concrete block, concrete foundation—17½'x25' 7'x12' high basement and outside entrance —5' platform along 25' side, 450 sq. ft. @ $2.00	F.& P.								900	100		900
Built 1912	Built 1912	Sand drying house, 1912—16'x22½'x 12' high, concrete foundations and floors, concrete block side walls—360 sq. ft. @ $2.00	F.& P.								720	100		720
Built 1912	Built 1912	Sand storage house, 1912—heavy frame building on concrete foundations—16'x40'	F.& P.								953	100		953
Built 1913	Built 1913	Cinder pit, 1913, with depressed tracks, concrete walls and piers with girders under rails	F.& P.								1,730	100		1,730
Omitted	Omitted	Sand house, old—12½'x32½'—not in use—406 sq. ft. @ $1.25	F.& P.								507	75		380
Built 1913	Built 1913	Sewer from new engine house	F.& P.								813	100		813
		Total									37,541			36,319
		D., S. S. & A.—½ interest									18,770			18,160
Total at Sault Ste. Marie				36,435		29,858	36,437		28,027	18,770		18,160		
ST. IGNACE:														
Roundhouse—7 stalls—12' and 25'x65' each—built 1888(sewer 1904—$333.91)—7 stalls @ $800	Same except 6 stalls and frame	Same as 1911	F.& P.	5,600	55	3,080	4,800	55	2,640	5,600	55	3,080		
Cinder pit—3½'x3'x95' @ $5.00 per ft.	Same	Same	F.& P.	475	50	238	475	50	238	475	50	238		

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1911—Exhibit 1—A		1911			1912			1913		
			Allocation	C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				$		$	$		$	$		$
Turntable (Edgemore)— 60 ft.—stone foundation (1881)	Same—built 1888	Same as 1911	F.& P.	3,480	50	1,740	3,500	50	1,750	3,480	50	1,740
Sand house (1881)—12'x15'x12'—180 sq. ft. @ $1.50	Same—shingle roof	Same	F.& P.	270	50	135	270	50	135	270	50	135
Car repair house—frame, shingle roof (1881)—20'x48'x13'—960 sq. ft. @ $1.00	Same	Same	F.& P.	960	50	480	960	50	480	960	50	480
Car repair store house—frame, B. & B. roof (1900)—5'x12'x6½'—60 sq. ft. @ $1.50	Same	Same	F.& P.	90	85	76	90	80	72	90	85	76
Total at St. Ignace				10,875		5,749	10,095		5,315	10,875		5,749
Soo Junction:												
Round house—2 stalls, built 1900—13' and 25'x64', 16' and 20'x64'—2 @ $800.00	Same	Same	F.	1,600	80	1,280	1,600	80	1,280	1,600	80	1,280
Total at Soo Junction				1,600		1,280	1,600		1,280	1,600		1,280
		Total Freight and Passenger								29,645		23,909
		Total Freight								1,600		1,280
Total East of Marquette				48,910		36,887	48,132		34,622	31,245		25,189
MARQUETTE TO HOUGHTON												
Marquette:												
B. & B. shop—frame, shingle roof, built 1881, 30'x50'x12'—1,500 sq. ft. @ $1.00	Omitted	Same—Blacksmith shop in lower Mackinaw yard	F.& P.	1,500	50	750				1,500	50	750
Machine shop—stone building, shingle roof, built 1881—24'x30'x16', 40'x97'x23', boiler room 26'x25'x11'—5,510 sq. ft. @ $1.00	Not there	Not there		5,510	50	2,755						
Roundhouse—stone building, R. R. R. roof, 10 stalls, each 12½' and 27½'x68½ ft—1,370 sq. ft. each—4 stalls each 12½' and 25'x63'—1,181 sq. ft. each—14 stalls @ $1,600	Same—built 1881	Same—in lower yard	F.& P.	22,400	50	11,200	22,400	60	13,440	22,400	50	11,200

Turntable—52 ft, iron (1895) brick lining and center	Same except stone wall	Same—in lower yard except stone pit, wall and center	F.& P.	3,016	70	2,111	3,000	60	1,800	3,016	70	2,111
Clinker pit (1881)—large, about 10'x50' @ $5.00	Same except old timber walls	Same—in lower yard except 4'x50'—depressed track pit, 10'x75'—timber walls	F.& P.	250	50	125	250	40	100	500	50	250
Car smith house (1881)—8½'x19'x7', 8'x14'x7' (assumed to be two halves of old box cars)	2 old car bodies	Can't identify		133	50	66	250	50	125			
Car smith house (1881)—18'x24'x11'—432 sq. ft. @ $1.00	Car smith and scrap houses—12'x 15'; 18'x22'; 10'x12'—696 sq ft. @ $1.00	Can't identify		432	50	216	696	50	348			
Pump repair house (1887)—near Third St., occupied by foreman of water stations—8'x10'—sq ft. @ $1.00	Same except 80 sq. ft. @ $1.50	Transferred to water stations schedule		80	60	48	120	60	72			
Car smith shop (1887)—frame, shingle roof—15'x18'—270 sq. ft. @ $1.00	Included above	Same in upper yard near car shop	F.& P.	270	60	162				270	60	162
Car smith shop (1881)—frame, shingle roof—20½'x21½'x10½'—440 sq. ft. @ $1.00	Can't identify	Can't identify		440	50	220						
Paint shop (1897)—corrugated iron sides and roof—24'x293'x16'—7,032 sq. ft.	Same except 24'x208'x16', 22'x72'x 16— 6,576 sq. ft.											
Addition to above—8'x48'x16'—384 sq. ft. This building is partly B. & B. sides with R. R. R. roof—7,416 sq. ft. @ 50c	Lean to—1902 480 sq. ft. 7,056 sq. ft. @ 50c	Same in upper yard	F.& P.	3,708	70	2,596	3,528	70	2,470	3,708	70	2,596
B. & B. shop—built 1872—30'x48'—1,440 sq. ft. @ $1.00	Same except 30'x50'—1,500 sq. ft.	Same as 1911 in upper yard	F.& P.	1,440	50	720	1,500	50	750	1,440	50	720
Car repair shop—shingle roof (1872)—30'x50'x 12'—1,500 sq. ft. @ $1.00	Omitted	Old Supt. office, lower yard, Jackson St., 1881, now used as yard office	F.& P.	1,500	50	750				1,500	50	750
Pattern store house (1872)—60'x30'—1,800 sq. ft. @ $1.00	Same	Same—in upper yard	F.& P.	1,800	50	900	1,800	40	720	1,800	50	900
Roundhouse, office and oil house—sand brick—built 1872	Can't identify	Can't identify		750	50	375						
Stone shops, adjacent to roundhouse—all under one roof, sandstone walls, shingle composition and tile roof, built 1881—dimensions taken from yard map—upper yard	Same except main building 1869 addition 1881											

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Alloc-ation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
Main building 50'x280' 14,000 sq. ft. Offset 20'x65' 1,300 sq. ft. Power house 30'x28' 840 sq. ft. Boiler shop 54'x60' 3,240 sq. ft. Total..... 19,380 sq. ft. @ $1.00	Main building 51'x282' 14,382 sq. ft. Offset 19'x94' 1,786 sq. ft. Power house 30'x27' 810 sq. ft. Boiler shop 54'x50' 2,700 sq. ft. Total..... 19,678 sq. ft. @ $1.00	Same as 1911	F.& P.	19,380	70	13,566	19,678	70	13,775	19,380	70	13,566
Built 1911-1912 Mackinaw car shop—frame—45'x110'—4,950 sq. ft. @ $1.00	Boiler shop addition 1911—42'x84' concrete floor, brick and frame walls—3,528 sq. ft.	Same except built 1912—upper yard	F.& P.				2,400	100	2,400	3,528	100	3,528
Car shop—brick building, steel trusses, composition roof, floor partly concrete, partly stone—256'x81'—20,736 sq. ft. @ $1.00	Same	Same—now used as repair shop for cars	F.& P.	4,950	50	2,475	4,950	30	1,485	4,950	50	2,475
Roundhouse—stone, 16 stalls @ $1600	Same—built 1910	Same—in upper yard	F.& P.	20,736	100	20,736	20,000	95	19,000	20,736	95	19,699
	Same—tarred paper roof, upper yard	Same	F.& P.	25,600	70	17,920	25,600	60	15,360	25,600	70	17,920
Turntable (1908)—steel—58 ft.—150 tons capacity—upper yard	Same—King Bridge Co. air turning engine—concrete walls	Same	F.& P.	3,190	95	3,030	3,200	90	2,880	3,190	95	3,030
Clinker pit and loading pit in upper yard	Same with concrete walls 11'x128'	Same as 1912	F.& P.	600	50	300	650	60	390	600	50	300
Sidewalks on street and walks and driveways in shop yards	Omitted	Same	F.& P.	300	75	225				300	75	225
Fencing—high board fencing around shop grounds	Omitted	Same—8' high in upper yard	F.& P.	500	60	300				500	60	300
Sewerage and Water:—There are sewers and water piping through the yard. There are no records of length, cost or size of much of the old construction. We found records of 304 ft. 4" sewer pipe 425 ft. 6" water pipe												

THIS PAGE B
VERTICAL IN

304 ft. 6" sewer pipe 37 ft. 8" sewer pipe 888 ft. 12" sewer pipe 18 connections 1 manhole We also found records of the expenditure of $2,631.15 during the past ten years. We estimate that this entire item cannot be reproduced for less than	465 ft. 4" water pipe 6 tees 4 hydrants 725 ft. underground air pipe 1¼" 200 ft. steam and air pipe											
Rail saw mill building (1910)—frame—30'x50'—1,500 sq. ft. @ $1.00	Underground piping system in yards, sewer. water, etc.	Same	F.& P.	5,000	90	4,500	6,000	80	4,800	5,000	90	4,500
Oil house (1909) brick, underground, actual cost Built 1913	Same	Same—upper yard	F.& P.	1,500	100	1,500	1,500	95	1,425	1,500	95	1,425
	Same as 1913 except built 1908—tanks underground Built 1913	Same as 1911 except concrete—1 story and basement—20'x24'—480 sq. ft.—actual cost	F.& P.	2,011	100	2,011	2,000	90	1,800	2,011	95	1,910
		Engine house, upper yard, under construction—total cost to June 30, 1913—15 stalls, brick, concrete pits and foundation. Above cost includes turntable and all material on hand.	F.& P.							27,524	100	27,524
Can't identify In miscellaneous buildings	Hand car shop—20'x30'—600 sq. ft. @ $1.00 In miscellaneous buildings	Can't identify Sand house, lower yard, frame, shingle roof, 1881—18'x24'x9'—432 sq. ft. @ $1.00	F.& P.				600	60	360	432	50	216
Omitted	Omitted	Water closet, lower yard, double, 1881, —6'x8'x6'	F.& P.							75	50	38
Omitted	Omitted	Engine house, lower yard on Lake St., old brick, 1881—iron roof, 4 stalls—12'x25'x63' (used as old locomotive storage)	F.& P.							6,400	50	3,200
Omitted	Omitted	Tool house, lower yard on No. 1 dock approach—8'x10'	F.& P.							80	60	48
Built 1912	Built 1912	Motor car house, in cut north of passenger station—8'x18'x7'—144 sq. ft. @ 50c—new 1912	F.& P.							72	80	58
In miscellaneous buildings	In miscellaneous buildings	Shop office, upper yrad, 1872—office of Supt. of M. P. ,brick	F.& P.							4,047	55	2,226
Built 1912	Included in shop machinery and tools	Turntable tractor—air propelled —installed 1912	F.& P.							413	100	413

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
In miscellaneous buildings	Omitted	Old iron houses (2) storage—upper yard	F.& P.							100	50	50
In miscellaneous buildings	In miscellaneous buildings	Toilet at shops—upper yard, 1881—18'x20'—360 sq. ft. @ $1.00	F.& P.							360	50	180
In miscellaneous buildings	In miscellaneous buildings	Sand house—upper yard, 1900	F.& P.							410	80	328
Omitted	Omitted	Car repair foreman's office, old box car body—Mackinaw yard	F.							150	75	112
Omitted	Omitted	Tool house—old box car body	F.							150	50	75
Omitted	Omitted	Tool house—built 1881—frame—11'x12'x7'—132 sq. ft. @ 75c	F.							99	50	50
Omitted	Omitted	Ore repair shed now used as barn	F.							100	50	50
Omitted	Omitted	Tool house—old car body	F.							75	50	38
Omitted	Omitted	Water closet—double	F.							75	50	38
Omitted	Omitted	Paint shed—12'x12'	F.							50	50	25
Omitted	Omitted	Car repair house—old box car body—10'x34'	P.							150	50	75
Total at Marquette				126996		89,557	120,122		83,500	164191		123061
NORTH ISHPEMING:												
In miscellaneous buildings	In miscellaneous buildings	Carsmith house, 1880—B. & B., shingle roof—10'x18'x7', 7'x9'x6'—243 sq. ft. @ $1.00	F.& P.							243	60	146
Total at North Ishpeming										243		146
SOUTH ISHPEMING:												
Roundhouse—stone building, R. R. R. roof—11½' and 25'x64'—built 1881—7 stalls @ $1,600	Same	Same with brick front	O.	11,200	50	5,600	11,200	50	5,600	11,200	50	5,600
Turntable (1900)—50 ft.—855.13	Same	Same with timber pit walls and center	O.	2,900	80	2,320	2,900	80	2,320	800	50	400
Clinker pit, brick	Same—built 1881	Same	O.	250	50	125	250	50	125	250	50	125
Car repair shop—12'x18'x18'—216 sq. ft. @ $1	Same—built 1881	Same	O.	216	70	151	216	70	151	216	70	151

		x23'x14'—368 sq. ft. @ $1.00	O.								368	50	184
Total at South Ishpeming				14,566		8,196	14,566		8,196	12,834		6,460
HUMBOLDT:													
In miscellaneous buildings	In miscellaneous buildings	Sand house, 1885—shingle roof—16'x 20'x11'—320 sq. ft. @ $1.00	F.& P.							320	55	176
Total at Humboldt										320		176
MICHIGAMME:													
Round house—built 1872—brick, new roof, 1901 R. R. R.—2 stalls @ $1,600	Same except new roof 1900	Same as 1911	F.& P.	3,200	80	2,560	3,200	70	2,240	3,200	80	2,560
Turntable (Edgemore)—50'—1872	Same	Same	F.& P.	2,900	50	1,450	2,900	50	1,450	2,900	50	1,450
Clinker pit (1902)—3'-9"x41'x4' @ $5 per ft.	Same	Same	F.& P.	205	50	102	205	50	102	205	50	102
Roundhouse—wooden, (old)—2 stalls @ $800	Belongs to C. & N. W.	Belongs to C. & N. W.		1,600	50	800						
In miscellaneous buildings	In miscellaneous buildings	Carsmith house, 1902, frame B. & B. roof—8'x8'x8'—64 sq. ft. @ $1.00	F.& P.							64	85	54
Total at Michigamme				7,905		4,912	6,305		3,792	6,369		4,166
L'ANSE:													
Roundhouse—stone—7 stalls @ $1,600.00 (only one stall in use)	Same—built 1872	Same	F.& P.	11,200	50	5,600	2,000	50	1,000	11,200	50	5,600
Machine shop—stone (now used as storehouse) —44'x84'—3,696 sq. ft. @ $1.00	Same	Same	F.& P.	3,696	50	1,848	3,696	50	1,848	3,696	50	1,848
Clinker pit—built fiscal year 1908	Same—4'x4'x22'	Same	F.& P.	220	90	198	200	90	180	220	90	198
Total at L'Anse				15,116		7,646	5,896		3,028	15,116		7,646
KEEWEENAW BAY:													
In miscellaneous buildings	In miscellaneous buildings	Carsmith house, 1901—iron roof—8'x 8'x8'—64 sq. ft. @ $1.00	F.& P.							64	85	54
In miscellaneous buildings	In miscellaneous buildings	Carsmith shop, 1901								64	85	54
Total at Keeweenaw Bay										128		108

Riggs—1911—Exhibit 1	Hansel-1912-Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
HOUGHTON:												
Roundhouse—re-inforced concrete, thoroughly modern—4 stalls @ $2250.00	Same	Same	F.& P.	9,000	100	9,000	9,000	95	8,550	9,000	95	8,550
Turntable (1883)—iron—50½ ft.	Same	Same	F.& P.	2,929	50	1,464	3,000	50	1,500	2,929	50	1,464
Clinker pit (1908)—4'x5'x36' @ $5.00 per lin. ft.	Same	Same	F.& P.	180	90	162	180	90	162	180	90	162
Carsmith shop (1890)—10'x20'—200 sq. ft. @ $1	Same	Same	F.& P.	200	65	130	200	65	130	200	65	130
In miscellaneous buildings	In miscellaneous buildings	Sand house, 1883, shingle roof—16'x20' x10'—320 sq. ft. @ $1.00	F.& P.							320	50	160
In miscellaneous buildings	In miscellaneous buildings	Carsmith house, 1890	F.& P.							64	60	38
In miscellaneous buildings	Omitted	Carsmith shop	F.& P.							64	60	38
In miscellaneous buildings	In miscellaneous buildings	Oil house, 1900—shingle —8'x8'x7', 8'x9'x5'—136 sq. ft. @ $1.50	F.& P.							204	80	163
Total at Houghton				12,309		10,756	12,380		10,342	12,961		10,705
		Total Freight and Passenger								198479		145545
		Total Freight								699		388
		Total Passenger								150		75
		Total Ore								12,834		6,460
Total Marquette to Houghton				176892		121067	168469		113,458	212162		152468
NESTORIA TO STATE LINE												
SIDNAW:												
In miscellaneous buildings	In miscellaneous buildings	Repair house (old cars)—8'x30'x7', 8'x 30'x7'	F.& P.							266	50	133
Total at Sidnaw										266		133
THOMASTON:												
Roundhouse—brick, slate roof trussed—15 stalls @ $1,600	Same except 16 stalls	Old house razed, 1913		24,000	75	18,000	16,000	50	8,000			
		New house under construction—total cost to June 30, 1913	F.& P.							16,370	100	16,370

		11 stalls, brick, concrete foundation and pits; also concrete turntable pit walls and center, above cost, includes turntable and all material on hand.											
Turntable—plate girder—56 ft.	Same—built 1887	Removed—1913		3,248	70	2,274	3,250	70	2,275			
Old shop—brick—50'x60'—3,000 sq. ft. @ $1.00		Same	F.& P.	3,000	60	1,800	3,000	70	2,100	3,000	60	1,800
—now used as oil and ice house	Same	Same										
Clinker pit—40'x3½' deep at $5.00 per ft.	Same		F.& P.	200	50	100	200	50	100	200	50	100
In miscellaneous buildings	In miscellaneous buildings	Sand house (1906)—12'x40'x8' high—480 sq. ft. @ $1.00	F.& P.							480	90	432
In miscellaneous buildings	In miscellaneous buildings	Oil house—8'x8'x7'—64 sq. ft. @ $2.00	F.& P.							128	80	102
Total at Thomaston				30,448		22,174	22,450		12,475	20,178		18,804
BESSEMER:												
Turntable—wooden prairie table—50 ft. (1897)	Omitted	Same as 1911	F.	750		No value				750	No	value
Total at Bessemer				750		0				750	No	value
REPUBLIC:												
Roundhouse—frame, moved from Bessemer—1 stall @ $900	Same	Same	F.& P.	900	75	675	900	70	630	900	75	675
Turntable—wooden—50 ft—built 1900	Same	Same	F.& P.	2,750	75	2,062	400	50	200	800	25	200
Total at Republic				3,650		2,737	1,300		830	1,700		875
		Total Freight and Passenger								22,144		19,182
		Total Freight								750		0
Total Nestoria to State Line				34,848		24,911	33,350		18,105	22,894		19,812

RECAPITULATION SHOPS, ENGINE HOUSES and TURNTABLES

Location	1911		1912		1913	
	C. R.	P. V.	C. R.	P. V.	C. R.	P. V.
	$	$	$	$	$	$
Sault Ste. Marie	36,435	29,858	36,437	28,027	18,770	18,160
St. Ignace	10,875	5,749	10,095	5,315	10,875	5,749
Soo Junction	1,600	1,280	1,600	1,280	1,600	1,280
Marquette	126,996	89,557	120,122	83,500	164,191	123,061
North Ishpeming					243	146
South Ishpeming	14,566	8,196	14,566	8,196	12,834	6,460
Humboldt					320	176
Michigamme	7,905	4,912	6,305	3,792	6,369	4,166
L'Anse	15,116	7,646	5,896	3,028	15,116	7,646
Keewenaw Bay					128	108
Houghton	12,309	10,756	12,380	10,342	12,961	10,705
Sidnaw					266	133
Thomaston	30,448	22,174	22,450	12,475	20,178	18,804
Bessemer	750	0			750	0
Republic	3,650	2,737	1,300	830	1,700	875
Total in Michigan	260,650	182,865	231,151	156,785	265,301	197,469
Added in testimony by Mr. Hansel:						
L'Anse Engine House			9,200	4,600		
Thomaston Engine House			9,600	4,800		
Overhead Expense—15% on above			2,820	2,820		
Deducted in Exhibit 50 by Mr. Riggs:						
Republic Turntable—Error	2,350	1,862				
Total	258,300	181,003	252,771	169,005	265,301	197,469

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911			1912			1913		
				C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				$		$	$		$	$		$
ROUND HOUSE AND MACHINE SHOP, MARQUETTE:												
1 double head wheel lathe, Bement & Sons	Same			5,000	90	4,500	5,000	80	4,000			
7—7 ft. single head wheel lathes—Putnam	Same			1,500	85	1,275	1,500	80	1,200			
1—18" slotter N. P. P. Co.	Same			2,100	85	1,785	2,100	85	1,785			
1—12" slotter—Lowell Machine Co.	Same			1,000	70	700	1,000	70	700			
1—14" compound planer, Lowell Machine Co.	Same			800	80	640	800	75	600			
1—18" shaper, Hendee Machine Co.	Same			250	70	175	250	60	150			
1—46" engine lathe, Bement & Sons	Same			2,000	80	1,600	2,000	70	1,400			
1—32" engine lathe, Bement & Sons	Same			1,500	80	1,200	1,500	80	1,200			
1—36" engine lathe, Putnam Co.	Same			1,500	80	1,200	1,500	85	1,275			
1—No. 1 Acme bolt cutter	Same			400	90	360	400	85	340			
1—Universal lathe grinder, American Tool Co.	Same			750	95	712	750	90	675			
1—30"x30"—7 ft. planer, Wm. Sellers	Same			1,000	85	850	1,000	85	850			
1—36"x36"—10 ft. planer, Niles Tool Works	Same			1,800	85	1,530	1,800	85	1,530			
1—36 inch wheel boring mill, Bement & Sons	Same			1,500	80	1,200	1,500	75	1,125			
1—36 inch wheel boring mill, New York Steam Engine Co.	Same			1,500	75	1,125	1,500	65	975			
1—Milling machine, New York Steam Eng. Co.	Omitted			700	70	490						
1—Wheel press, Bement & Son	Same			2,000	80	1,600	2,000	75	1,500			
1—Small drill press, Putnam Mach. Co.	Same			200	70	140	200	70	140			
1—Large drill press, Putnam Mach. Co.	Same			350	85	297	350	80	280			
3—18" engine lathes @ $400	Same			1,200	80	960	1,200	75	900			
1—Duplex air compressor No. 10, Rand Drill Co.	Same			2,800	95	2,660	2,800	90	2,520			
1—Small wall drill press—Putnam Machine Co.	Same			125	70	87	125	70	87			
1—18" engine lathe, 10 ft. bed	Same			475	85	404	475	80	380			
1—22" engine lathe, 10 ft.bed	Same			525	85	446	525	80	420			
1—18" engine lathe, 8 ft. bed	Same			500	85	425	500	80	400			
1—17" engine lathe, 8 ft. bed	Same			400	85	340	400	80	320			
1—24" engine lathe, 14 ft. bed	Same			500	85	425	500	80	400			
18—Machinist vises @ $19.20	Miscellaneous machine tools			346	70	242	5,500	70	3,850			
10—Hanging air hoists 4"x6"—cylinder @ $12.50	Included above			125	95	119						
1,000 ft. ¾ inch 4 ply air hose	Included above			250	50	125						

1—1 ton duplex chain block	Included above				25	80	20						
1—2 ton differential chain block	Included above				8	80	6						
1—½ ton triplex chain hoist	Included above				18	80	14						
1—Small block and tackle	Included above				3	70	2						
3—¾ inch block and tackle	Included above				12	70	8						
1—52 inch grindstone and frame	Same				20	60	12	20	55	11			
1—Double emery wheel tool grinder	Same				40	80	32	40	75	30			
1—Valve setting machine	Included above				125	80	100						
1—Portable boring bar	Included above				200	70	140						
1—Valve setting machine	Included above				75	70	52						
4—No. 3 combination air drills @ $40	Included above				160	75	120						
2—No. 8 Thor close quarter drills @ $62.50	Included above				125	80	100						
2—No. 4 Chicago close quarter drills @ $95.00	Included above				190	80	152						
5—Large air drills @ $90.00	Included above				450	80	360						
4—35 ton Norton ball bearing jacks @ $93.50	Included above				374	80	299						
1—Shop air plant, tool room	Included above				350	75	262						
1—Worthington duplex—9″x5½″ pump for washing out engines	Included above				200	65	130						
2—Air jack for jacking engines @ $75.00	Included above				150	75	112						
1—Air jack for jacking wheels	Included above				40	75	30						
1—Drop pit air jack	Included above				100	80	80						
1—Pipe stand and two pipe vices	Included above				30	70	21						
1—8′x24″ air hoist	Included above				35	80	28						
1—Hydraulic press for driving boxes	Included above				75	75	56						
1—Hand derrick	Included above				100	60	60						
1—Lot machine and hand tools	Included above				2,688	50	1,344						
Shafting, pulleys, belting, etc.	Same				889	70	622	900	70	630			
		Same as Exhibit No. 1		$39,578			$31,774	$38,135		$29,683	$39,578		$31,774
Bought 1911-12	1—Sturtevant blower	In Blacksmith Shop	F.& P.					621	95	590			
Bought 1911-12	1—Vertical Turret boring machine (N. B. P. Co.)	Same	F.& P.					1,295	95	1,230	1,420	95	1,349
Bought 1911-1912	1—Car wheel borer (N. B. P. Co.)	Same—48″	F.& P.					1,876	95	1,782	1,900	95	1,805
Bought 1911-1912	1—84″ driving wheel lathe (N.B.P. Co.)	Same	F.& P.					8,812	95	8,371	8,162	95	7,754
Bought 1911-1912	1—Tools for driving wheel lathe	Same	F.& P.					346	85	294	350	95	332
Bought 1911-1912	1—Turntable tractor	In Shops, Eng. House and Turntable Schedule	F.& P.					433	95	411			
Bought 1911-1912	1—5 ft. Radial drill —gear driven	Same	F.& P.					977	95	928	1,000	95	950

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911			1912			1913		
				C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				$		$	$		$	$		$
Bought 1911-1912	1—Double portable crank pin press (Watson Stillman Co.)	Same—250 ton	F.& P.				760	95	722	835	95	793
Bought 1912-1913	Bought1912-1913	1—G. E. Co. No. 8—75 a., 220 v., 60 cycle—motor complete erected	F.& P.							600	95	570
Total				39,578		31,774	53,255		44,001	53,845		45,327
BOILER SHOP, MARQUETTE:												
1—Power punch, 25 inch throat, built by D. S. S. & A.	Same			650	85	552	650	70	455			
1—Power shears, 28 inch throat, built by D., S. S. & A.	Same			650	85	552	650	70	455			
1—Bolt cutter, Acme Machine Co.	Same			600	90	540	600	85	510			
1—Pair 8" clamps	Same			250	85	212	250	80	200			
1—Air punch	Same			150	85	127	150	75	112			
1—Machine flue cutter, built by D., S. S. & A.	Same			100	75	75	100	75	75			
1—Hacksaw machine	Same			60	85	51	60	80	48			
1—Air hoist for clamps	Miscellaneous tools			50	90	45	2,000	70	1,400			
1—Portable oil burner	Included above			75	70	53						
1—Perfect flue cutter and cutters	Included above			50	70	35						
1—Pneumatic rivet forge	Included above			16	70	11						
2—Rivet forges, D., S. S. & A. @ $12.50	Included above			25	70	18						
4—Pair rivet tongs	Included above			3	60	2						
1—Forged steel screw punch with ratchet wrench	Included above			35	65	23						
1—Pair hand rollers	Included above			25	80	20						
1—Hand shear	Included above			10	80	8						
1—Little giant reversible drill	Included above			90	80	72						
1—Thor pneumatic riveting hammer No. 50	Included above			53	85	45						
1—Long stroke Boyer Hammer No. 90	Included above			75	85	64						
1—Long stroke Boyer hammer No. 60	Included above			150	85	127						
1—Long stroke Boyer hammer No. 0	Included above			50	85	42						
4—Chipping hammers No. 3 @ $45.40	Included above			182	70	127						

					12	80	10								
1—Anvil	Included above				175	95	166								
8,000 lbs flange blocks @ 2¾c	Included above				50	80	40								
1—Testing pump	Included above				15	60	9								
1—Jam bolder on	Included above				8	80	6								
1—Differential pulley block—2 ton	Included above				7	80	6								
1—Differential pulley block—1½ ton	Included above				25	80	20								
1—Yale and Towne duplex —1 ton chain block	Included above				10	50	5								
20 rivet sets	Included above				10	65	6								
2—Stay bolt chucks	Included above				45	70	32								
6—Spindle taps—15/16" to 1⅜"	Included above				42	70	29								
6—Echols Pat. stay bolt taps 15/16" to 1⅜"	Included above				12	70	8								
10—Boiler taps	Included above				45	75	34								
8—Reamers assorted,	Included above				36	75	27								
6—Plug taps—2" to 3¼"	Included above				137	70	96								
10—Flue rollers, assorted	Included above				3	60	2								
1—Pair skeleton flue rollers	Included above				5	65	3								
1—1¼ inch flue roller	Included above				45	70	32								
5—Prosser flue expanders, assorted	Included above				38	50	19								
134—Machine punches, assorted	Included above				21	65	14								
30—Machine dies, assorted	Included above				28	70	20								
7—Drill chucks	Included above				154	60	92								
Shafting pulleys and belting	Included above														
1 lot hand tools consisting of hammers, wrenches, sledges, etc.	Included above				124	50	62								
Total		Same as Exhibit No. 1	F.& P.	4,396		3,539	4,460		3,255	4,396		3,539			
Bought 1912	1—Set plate bending rolls, Niles Bement Pond	Same—No. 6 plate bending rolls, belt driven countershaft	F.& P.				3,438	95	3,266	3,663	95	3,480			
Bought 1913		1—Flue rattler and motor erected	F.& P.							775	95	736			
Total				4,396		3,539	7,898		6,521	8,834		7,755			
BLACKSMITH SHOP, MARQUETTE:															
1—Bar iron shears	Same			500	85	425	500	80	400						
1—Steam hammer	Same			1,000	80	800	1,000	70	700						
1—Hammer furnace	Same			200	75	150	200	70	140						
1—Spring furnace	Same			200	75	150	200	70	140						
1—Bolt furnace	Same			100	70	70	100	70	70						
1—1¼" bolt furnace	Same			500	80	400	500	75	375						

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
1—45 inch Buffalo cupalo and forge	Same			100	80	80	100	70	70			
1—McGrath pneumatic flue welding machine	Same			250	80	200	250	65	163			
1—Flue furnace	Same			75	70	52	75	70	53			
1—Double emery grinder	Same			75	75	56	75	70	53			
1—Air bull dozer—14"x28"	Same			350	75	262	350	75	262			
1—Lot cast iron tools for bull dozer, 3,660 lbs	Miscellaneous tools			73	75	55	1,650	70	1,155			
2—Cast iron anvils, 1,600 lbs @ 2c	Included above			32	75	24						
8—Peter Wright anvils, 3,070 lbs @ 5½c	Included above			169	75	127						
1,150 lbs hammer swadges iron @ 4½c	Included above			63	70	44						
900 lbs tools, soft steel, @ 4½c	Included above			49	50	24						
1,500 lbs shop tongs @ 5c	Included above			75	50	38						
1,600 lbs steel tools, chisels, etc., @ 15c	Included above			240	50	120						
2—1 ton Weston's chain hoist @ $14.23	Included above			28	75	21						
1—3 ton Y. & T. triplex chain hoist	Included above			60	75	45						
1—3 ton Boss patent chain hoist	Included above			50	75	38						
2—Jib cranes on wall, 13 ft. long @ $25.00	Included above			50	50	25						
1—Jib cranes in center of shop, 17 ft. long	Included above			150	50	75						
3—Single forges, 4 ft, 5 in square cast iron @ $15.00	Included above			45	50	22						
4—Double forges—8'-10"x4'-5"	Included above			150	50	75						
8—Smoke jacks 15 inches in diameter by 22 ft. long	Included above			144	50	72						
Shafting, pulleys, belting, etc.	Included above		F.& P.	284	60	170						
Total		Same as Exhibit No. 1		5,012		3,620	5,000		3,581	5,012		3,620
Bought 1911-1912	1—1,500 lb single frame hammer	Same—erected	F.& P.				1,603	95	1,523	1,700	95	1,615
Bought 1911-1912	1—2 inch bar shear, Long & Allstatter	Same	F.& P.				987	95	938	985	95	936
Bought 1911-1912	In round house	1—Motor driven jaw—complete with motor	F.& P.							620	95	589
Total				5,012		3,620	7,590		6,042	8,317		6,760

THIS PAGE BO
VERTICAL IN

Brass Foundry, Marquette:												
2—Furnaces and stacks	Same			200	65	130	200	60	120			
1—Crane	Same			25	50	12	25	50	12			
40—Flasks	Same			60	40	24	60	40	24			
2—Emery wheels and stands	Miscellaneous tools			30	50	15	135	70	95			
1—Vise	Included above			15	70	10						
Babbitting implements	Included above			25	70	18						
25—Car brass mandrels	Included above			20	80	16						
1 scale	Included above			2	65	1						
1 lot moulders' tools	Included above			41	70	29						
Total		Same as Exhibit No. 1		418		255	420		251	418		255
Tin Shop, Marquette:												
18—Tinners machine tools	Same			262	75	196	262	75	196			
1—Lot hand tools	Same			63	70	44	63	70	44			
13—Bench stakes	Same			46	80	37	46	80	37			
10—Steel mandrels, 1 to 3 inches	Same			2	100	2	2	100	2			
Total		Same as Exhibit No. 1		373		279	373		279	373		279
Engine and Boiler Room, Marquette:												
2—200 H. P. stationery boilers and equipment	Same			4,250	70	2,975	4,250	70	2,975			
1—Stationery engine—18"x24"	Same			1,000	50	500	1,000	55	550			
1—Boiler feed pump	Same			100	50	50	100	55	55			
Total		Same as Exhibit No. 1		5,350		3,525	5,350		3,580	5,350		3,525
Fire Apparatus, Marquette:												
1—12"x12" Fire pump	Same			250	80	200	250	80	200			
600 ft. 2½ inch fire hose	Same			360	70	252	360	70	252			
Total		Same as Exhibit No. 1		610		452	610		452	610		452
Yard Marquette:												
1—Large air hoeit for loading material	Same			300	80	240	300	80	240			
Miscellaneous car repair tools at passenger depot	Same		F.& P.	55	80	44	55	80	44			
Total		Same as Exhibit No. 1		355		284	355		284	355		284

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
LOWER ROUNDHOUSE, MARQUETTE:												
1—Locomotive heating boiler, piping, etc.	Same			800	70	560	800	70	560			
1—Air plant, piping, for car testing	Same			300	70	210	300	70	210			
2—15 ton hydraulic jacks	Same			40	70	28	40	70	28			
7—Screw Jacks assorted	Same			26	60	16	26	60	16			
1—Lot hand tools	Same			191	50	96	191	50	96			
Miscellaneous car repair tools	Same		F.& P.	398	80	318	398	80	318			
Total		Same as Exhibit No. 1		1,755		1,228	1,755		1,228	1,755		1,228
CAR SHOP, MARQUETTE:												
1—No. 5 J. A. Fay & Egan Co. large band sawing machine 581.20	Same						627	95	596			
6—Saws 16.50												
1—No. 363 Std. Weiland pipe threading and cutting machine with dies 720.00	Same						795	90	715			
1—2" double Acme bolt cutter, class A with dies ½" to 2" 680.00	Same						740	95	703			
1—No. 132 Hamilton 24" power feed sander 295.00	Same						335	95	318			
1—12" Prentice Sherman & Co. pattern-makers turning lathe, 6 ft. frame 100.00	Same						80	85	68			
1—Putnam drill press to 1½" drills 275.00	Same except 2 instead of 1						600	85	510			
1—No. 1 J. A. Fay & Egan Co. improved variety saw 135.07	Same						159	85	135			
1—Bolt pointer 40.00	Same						50	85	42			
1—20 H. P. General Electric Co. motor No. 267329 209.59	Same											
Installing 86.99	Same											
Foundation labor and material 100.56	Same including labor of installing, foundations, etc.						395	90	355			

3—20′ cold rolled 2¼″ shafts	18.24	All shafting and belting					600	90	540	
8—Pulleys	91.09	Included above								
9—Hangers	45.51	Included above								
8—Belts	215.25	Included above								
Total					3,610	100	3,610			
1—Shim boring machine	25.00	Same					40	90	36	
1—Norton Company's emery wheel stand	30.00	Same					40	90	36	
2—Emery wheels—18″ diameter—3″ thick—1½″ arbor	29.36	Same					30	80	24	
1—5′-8″ face grindstone and frame	30.00	Same					45	85	38	
1—Beatricks & Harvey band saw setting and filing machine	92.71	Same					140	85	119	
1—Buffing machine	35.00	Same					40	90	36	
1—No. 71 Baldwin, Tuthill & Bolton 40″ automatic rip and cross-cut saw sharpener	101.85	Same					120	90	108	
1—7½ H. P. Westinghouse Electric Co. motor No. 129,409	193.68	Same including labor of installing, foundation, etc.					348	95	331	
Installing	86.97									
Foundation, labor and material	75.42									
7 belts	58.84	Included above								
3 pulleys	27.07	Included above								
1—20 foot cold rolled 2¼″ shaft	6.08	Included above								
Total					792	100	792			
1—No. 325 Greenlee Bros. & Co. automatic 3-spindle vertical boring machine	740.00	Same					740	95	703	
1—Belt	12.19	Included above								
1—7½ H. P. General Electric Co. motor No. 404,249	187.14	Same including labor of installing, foundation, etc.					295	95	280	
Installing	86.99									
Foundation, labor and material	18.68									
Total					1,045	100	1,045			
1—No. 3 J. A. Fay & Co. universal woodworking machine	743.02	Same					750	85	637	
4 belts	29.26	Included above								

Riggs—1911—Exhibit 1		Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
					$		$	$		$	$		$
1—15 H. P. General Electric Co. motor No. 252612	239.63	Same including labor of installing, foundation, etc.											
Installing	86.99							345	95	328			
Foundation, labor and material	16.10												
Total					1,115	100	1,115						
1—No. 6,460 J. A. Fay & Co. rip sawing machine	200.00	Same						158	90	142			
4 saws	22.40	Omitted											
1 belt	9.60	Included above											
1—10 H. P. General Electric Co. motor No. 270,740	274.44	Same including labor of installing, foundations, etc.						375	95	356			
Installing	86.99												
Foundation, labor and material	12.57												
Total					606	100	606						
1—No. 1 J. A. Fay & Egan Co. car sill and timber dresser	1,728.92	Same						1,855	90	1,669			
3 belts	61.65	Included above											
1—50 H. P. Westinghouse Electric Co. motor No. S69625	400.76	Same including labor of installing, foundation, etc.						400	95	380			
Installing	86.99												
Foundation, labor and material	18.68												
Total					2,297	100	2,297						
1—No. 457 Greenlee Bros. & Co. auto cut-off. machine	470.00	Same						570	90	513			
2 saws—32" and 40"	38.65	Omitted											
2 belts	14.07	Included above											
1—20 H. P. Westinghouse Electric Co. motor No. 399,856	309.59	Same including labor of installing, foundation, etc.						300	95	285			
Installing	86.99												
Foundatiln, labor and material	14.00												
Total					933	100	933						

1—J. A. Fay & Co. tenoning machine	300.00	Same						400	85	340			
1 belt	10.29	Included above											
1—10 H. P. General Electric Co. motor No. 270,512	232.72	Same including labor, installing, foundation, etc.						243	95	231			
Installing	86.99												
Foundation, labor and material	17.00												
Total				647	100	647							
1—No. 238 Greenlee Bros. & Co. extra range vertical hollow car chisel mortiser	1,410.00	Same						1,519	90	1,367			
2 belts	16.45	Included above											
1—15 H. P. Westinghouse Electric Co. motor No. 129,422	243.88	Same including labor of installing, foundation, etc.						239	95	227			
Installing	86.99												
Foundation, labor and material	18.68												
Total				1,776	100	1,776							
Miscellaneous small tools in car shop		Same		739	80	591		90	80	72			
Total in Car Shops			Same as Exhibit No. 1	13,560		13,412		13,463		12,240	13,560		13,412
MACHINERY IN RAIL MILL, MARQUETTE:													
1—100 H. P. C. C. L. motor, 2,200 v.—7,200 alts.	697.47	Same						697					
60 hours labor wiring	21.00	Same						21					
1—Bed plate S 64,160 and auto starter	21.87	Same						22					
1—42" cold sliding saw with 5 H. P. crane tie piece A. C. and motor table, United Eng. & Foundry Co.	1,678.34	Same						1,678					
4—Extra saw blades	68.30	Same						68					
1—3-spool rail drill	1,012.01	Same						1,012					
Labor	239.12	Same						239					
1—Belt—39 5-12' long—18" wide	105.42	Same						105					
1—Canvas belt	34.00	Same						34					
2—Shafts—2" diameter—20' long	11.50	Same						12					
1—Wood pulley—42" diameter—10" face	11.00	Same						11					
1—Wood pulley—20" diameter—11" face	5.65	Same						6					
1—Belt—4½" wide—25' long	9.25	Same						10					
1—Belt—4½" wide—28' long	10.36	Same						10					
1—Belt—8" wide—28'-6" long	18.52	Same						19					

Riggs—1911—Exhibit 1		Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
					$		$	$		$	$		$
4—Shaft Boxes	8.33	Same						8					
104—Bags cement	42.86	Same		F.& P.				43					
Total			Same as Exhibit No. 1 except P. V.		3,995	100	3,995	3,995		3,595	3,995	95	3,795
Bought 1911-1913		Bought 1911-1913	1—Shingle machine for making track shims	F.& P.							350	95	332
Bought 1911-1913		Bought19 11-1913	1—Knife grinding machine	F.& P.							200	95	190
Total					3,995	100	3,995	3,995	90	3,595	4,545		4,317
PAINT SHOP, MARQUETTE:													
Miscellaneous tools and equipment		Same	Same as Exhibit No. 1	F.& P.	313	80	250	313	80	250	313		250
PATTERNS, MARQUETTE:													
835 car patterns		Same											
1,145 brass patterns		Same											
1,525 engine patterns		Same											
1,538 miscellaneous patterns		Same											
5,043 total patterns @ an average of $2.00 each		Same	Total as per Exhibit No. 1		10,086	70	7,060	10,086	70	7,060	10,086		7,060
SAULT STE. MARIE:													
1—Locomotive boiler for heating purposes, including all piping, etc.		Same			850	70	595	850	70	595			
1—Large forge and air pump for air blast		Same			105	70	74	105	70	74			
1—Cummings hand forge		Same			32	65	21	32	65	21			
1—Air drum for storage		Same			18	95	17	18	95	17			
1—Anvil		Same			20	80	16	20	80	16			
2—Ball bearing 35-ton Norton jacks @ $93.50		Same			187	75	140	187	75	140			
11—Screw jacks		Same			39	65	25	39	65	25			
2—Dudgeon hydraulic jacks—30 ton @ $50		Same			100	80	80	100	80	80			
1—Bull dozer		Same			10	70	7	10	70	7			
1—Driving spring puller		Same			6	65	4	6	65	4			
2—Equalizer pullers @ $5.96		Same			12	70	8	12	70	8			

50—Feet steam hose	Same			39	50	20	39	50	20				
1—Air drum and apparatus for heating and setting tires	Same			35	75	26	35	75	26				
1—Apparatus for blowing out flues	Same			25	70	18	25	70	18				
Miscellaneous tools and equipment in car shop	Same			1,028	80	823	1,028	80	823				
1—Lot hand tools, etc.	Same		F.& P.	218	50	109	218	50	109				
		Same as Exhibit No. 1—$2,724—½ interest								1,362		992	
Bought 1913	Bought 1913	Equipment in new boiler house consists of 2—60" x18'-00" tubular boilers, complete with steam fittings, stack, breeching and suspension, including grates, etc. $1,970											
		1—12"x8"x12" Blake duplex boiler washout pump 540											
		1—6"x4"x6" Blake duplex boiler feed pump 83											
		1—10½" Westinghouse cross compound air compressor (complete) 268											
		Labor and material for piping and equipment of boilers and labor installing steam, water and air plant in both boiler and engine house 3,152											
		$6,013											
		D., S. S. & A.—½ interest	F.& P.							3,006	100	3,006	
Total				2,724		1,983	2,724		1,983	4,368		3,998	

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
ST. IGNACE:												
1—Locomotive boiler for heating purposes, piping, etc.	Same			700	70	490	700	70	490			
2—35 ton Norton jacks	Same			187	75	140	187	75	140			
1—8 inch air pump	Same			89	65	58	89	65	58			
150—Feet hose	Same			87	50	44	87	50	44			
2—15 ton hydraulic jacks @ $20.00	Same			40	65	26	40	65	26			
2—20 ton hydraulic jacks @ $25.00	Same			50	65	32	50	65	32			
1—Air drum and apparatus for heating tire	Same			35	75	26	35	75	26			
4—Screw jacks	Same			17	50	8	17	50	8			
1—Lot hand tools	Same			140	50	70	140	50	70			
Miscellaneous tools and equipment in car shop	Same		F.& P.	262	80	210	262	80	210			
Total at St. Ignace		Same as per Exhibit No. 1		1,607		1,104	1,607		1,104	1,607		1,104
SOO JUNCTION:												
1—Small lot hand tools	Same	Total as per Exhibit No. 1		8	50	4	8	50	4	8	50	4
TROUT LAKE:												
Miscellaneous car repair tools	Same	Total as per Exhibit No. 1		24	80	19	24	80	19	24	80	19
NEGAUNEE:												
Miscellaneous car repair tools	Same	Total as per Exhibit No. 1		179	70	125	179	70	125	179	70	125
ISHPEMING (South):												
10—Screw Jacks, assorted	Same			56	60	34	56	60	34			
1—Portable forge	Same			13	60	8	13	60	8			
2—Driving spring pullers $5.96	Same			12	65	8	12	65	8			
3—Large coal stoves for heating purposes @ $40	Same			120	60	72	120	60	72			
1—Sand dryer	Same			100	70	70	100	70	70			
1—Lot hand tools	Same			103	50	52	103	50	52			
Miscellaneous car repair tools	Same		O.	47	70	33	47	70	33			
Total		Same as Exhibit No. 1		451		277	451		277	451		277

MICHIGAMME:													
1—Lot hand tools	Same			78	50	39	78	50	39				
Miscellaneous car repair tools	Same		F.& P.	37	70	26	37	70	26				
Total				115		65	115		65	115		65	
NESTORIA:													
Miscellaneous car repair tools	Same	Same as Exhibit No. 1	F.& P.	221	70	155	221	70	155	221	70	155	
HOUGHTON:													
1—Locomotive boiler for heating purposes, piping, etc.	Same			750	70	525	750	70	525				
1—Large pump for general purposes	Same			200	60	120	200	60	120				
7—Screw jacks, assorted	Same			34	60	20	34	60	20				
2—Ratchet jacks, 18 inches	Same			30	60	18	30	60	18				
1—Spring puller	Same			6	65	4	6	65	4				
1—Lot hand tools	Same			47	50	24	47	50	24				
Miscellaneous car repair tools	Same		F.& P.	263	70	184	263	70	184				
Total		Same as Exhibit No. 1		1,330		895	1,330		895	1,330		895	
THOMASTON:													
1—Locomotive for heating purposes, piping, etc.	Same			850	70	595	850	70	595				
1—Cameron pump No. 7 for pumping from slough	Same			300	70	210	300	70	210				
1—Worthington Duplex pump—4"x6"x4"	Same			90	65	58	90	65	58				
2—35 ton Norton jacks @ $93.50	Same			187	70	131	187	70	131				
1—20 ton Hydraulic jack				25	70	18	25	70	18				
2—15 ton hydraulic jacks @ $20.00				40	60	24	40	60	24				
6—Screw jacks, assorted				16	50	8	16	50	8				
1—Driving spring puller				6	70	4	6	70	4				
1—Driving equalizer puller				10	70	7	10	70	7				
1—Forge				32	65	21	32	65	21				
1—Anvil				5	70	4	5	70	4				
1—8 inch air pump and reservoir				79	70	55	79	70	55				
250—Feet 2½ inch hose				167	50	84	167	50	84				
1—Steam test gauge for testing engines				20	90	18	20	90	18				
1—Iron wheelbarrow				8	60	5	8	60	5				
1—2 wheel truck				5	50	2	5	50	2				
1—Lot hand tools				276	50	138	276	50	138				
Miscellaneous car repair tools				311	70	218	311	70	218				
Total		Same total as Exhibit No. 1	F.& P.	2,427		1,600	2,427		1,600	2,427		1,600	

	1911		1912		1913	
	C. R.	P. V.	C. R.	P.V.	C. R.	P. V.
	$	$	$	$	$	$
MARQUETTE:						
Round House and Machine Shop	39,578	31,774	53,255	44,001	53,845	45,327
Boiler Shop	4,396	3,539	7,898	6,521	8,834	7,755
Blacksmith Shop	5,012	3,620	7,590	6,042	8,317	6,760
Brass Foundry	418	255	420	251	418	255
Tin Shop	373	279	373	279	373	279
Engine and Boiler Room	5,350	3,525	5,350	3,580	5,350	3,525
Fire Apparatus	610	452	610	452	610	452
Yard Apparatus	355	284	355	284	355	284
Lower Roundhouse	1,755	1,228	1,755	1,228	1,755	1,228
Car Shop	13,560	13,412	13,463	12,240	13,560	13,412
Rail Mill	3,995	3,995	3,995	3,595	4,545	4,317
Paint Shop	313	250	313	250	313	250
Patterns	10,086	7,060	10,086	7,060	10,086	7,060
Total	85,801	69,673	105,463	85,783	108,361	90,904
MARQUETTE	85,801	69,673	105,463	85,783	108,361	90,904
SAULT STE. MARIE	2,724	1,983	2,724	1,983	4,368	3,998
ST. IGNACE	1,607	1,104	1,607	1,104	1,607	1,104
SOO JUNCTION *	8	4	8	4	8	4
TROUT LAKE	24	19	24	.9	24	19
NEGAUNEE	179	125	179	125	179	125
ISHPEMING (South) *	451	277	451	277	451	277
MICHIGAMME	115	65	115	65	115	65
NESTORIA	221	155	221	155	221	155
HOUGHTON	1,330	895	1,330	895	1,330	895
THOMASTON	2,427	1,600	2,427	1,600	2,427	1,600
Total in Michigan	94,887	75,900	114,549	92,010	119,091	99,146

* 1911 and 1912 appraisals, not allocated, 1913 all Freight and Passenger except Soo Junction which is Freight and South Ishpeming which is Ore.

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS — ROADWAY AND CONSTRUCTION TOOLS

The items and amounts in this schedule are the same in all three appraisals, therefore the details are omitted in this comparison and the results by divisions are given. There has been no change in the number of sections nor in the equipment.

	Riggs—1911 Exhibit 1		Hansel—1912 Exhibit 15		Riggs—1913 Exhibit 1-A	
	C. R.	P. V.	C. R.	P. V.	C. R.	P. V.
	$	$	$	$	$	$
FREIGHT AND PASSENGER	16,040	12,832	16,040	12,832		
Saulte Ste. Marie to Marquette					4,931	3,944
St. Ignace to Soo Junction					1,524	1,219
Marquette to Nestoria					3,488	2,791
Nestoria to Houghton					2,111	1,689
Nestoria to State Line					3,508	2,806
FREIGHT:						
Sault Ste. Marie to Marquette—None						
St. Ignace to Soo Junction					160	128
Marquette to Nestoria—None						
Nestoria to Houghton—None						
Nestoria to State Line—None						
PASSENGER:						
None						
ORE:						
Sault Ste. Marie to Marquette—None						
St. Ignace to Soo Junction—None						
Marquette to Nestoria					319	255
Nestoria to Houghton—None						
Nestoria to State Line—None						
TOTAL IN MICHIGAN	16,040	12,832	16,040	12,832	16,041	12,832

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
			C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
			$		$	$		$	$		$
SAULTE STE. MARIE TO MARQUETTE:											
SAULT STE. MARIE		All items in 1913 appraisal are freight and passenger except as noted.									
Tank, 16'x24'	Same	Tank, 1913, Standard wood, 50,000 gals., $1,830 ½ interest	1,870	80	1,496	2,000			915	100	915
City Supply, stand pipe	Same	Standpipe. 10' Fairbanks, concrete pit, complete, $1,292—½ interest	700	60	420	700			646	100	646
		Water main from city main to tank, $618—½ interest							309	100	309
			2,570		1,916	2,700	70	1,890	1,870		1,870
WELLSBURG:											
Tank, 24'x16'	Same	Same	1,870	80	1,496	2,000			1,870	90	1,683
Pump house, frame, shingle roof (1896), 12'x15'x14'—180 sq. ft. @ $1.00	Omitted	Same as 1911	180	80	144				180	80	144
Well, 22'x22'x25'=12,000 cu. ft.											
450 cu. yds. excavation @ $1.00 $450	Omitted	Abandoned									
100 cu. yds. wall 6.00 600	Omitted	Abandoned									
Curbing and piping 50	Omitted	Abandoned	1,100	100	1,100						
Dam and pipe line (1910) 7,500 ft. of 4" wood. Actual cost	Same	Same	2,592	100	2,592	2,592			2,592	100	2,592
Pump and boiler	Omitted	Removed	450	80	360						
Miscellaneous tools and supplies	Same	Same	50	80	40	50			50	80	40
			6,242		5,732	4,642	70	3,249	4,692		4,459
ECKERMAN											
Tank, 16'x24'	Same	Same as 1911	1,870	80	1,496	2,000			1,870	80	1,496
Pump house, frame, iron roof 12'x14'x10' 252 sq. ft. @ $1.00 6'x14'x 8'	Same	Same as 1911	252	80	202	252			252	80	202

No. 8 McGowan Pump and boiler on foundation		Same		Same as 1911	450	60	270	450			450	80	270	
Miscellaneous tools and supplies		Same		Same as 1911	50	80	40	50			50	80	40	
Well, 14'x14'x14'—2,744 cu. ft.—3 "plank covering														
105 cu. yds. excavation @ $1.00	$105	105 c. y. excavation @ $1.00		Same as 1911				105						
30 cu. yds. masonry 6.00	180	30 c. y. masonry 6.00		Same as 1911				180						
Curbing and piping	30	Curbing and piping		Same as 1911				250						
	315				315	100	315				315	100	315	
Soo Junction:					2,937		2,323	3,287	70	2,301	2,937		2,323	
Tank, standard, 16'x24' (1905)		Same		Same	1,870	90	1,683	2,000			1,870	90	1,683	
Stand pipe, 8" Dooge, concrete pit		Same		Same	700	90	630	700			700	90	630	
Pump house (1905) 9'x14'x12' } 238 sq. ft. @ $1.00		Pump House (1905)												
Addition to (1909) 8'x14'x6' }		14'x18'x10' } 364 s.q												
		Addition to (1909)												
		8'x14'x6' } @ 1.00		Same	238	90	214	364			238	90	214	
Worthington pump—McGowan boiler, foundation and setting		same		Same	450	80	360	450			450	80	360	
Miscellaneous tools and supplies		Same		Same	50	80	40	50			50	80	40	
Well and pipe line built, 1909, at actual cost		Same		Same	585	100	585	585			585	100	585	
McMillan:					3,893		3,512	4,149	70	2,904	3,893		3,512	
Tank, 16'x24' (1911), moved from 3 miles east of Dollarville, remodelled, and put in first class condition		Same		Same	1,870	100	1,870	2,000			1,870	95	1,776	
Well and pipe line		Same		Same	500	80	400	300			500	80	400	
Pump house, 12'x14'x10', addition 6'x14'x6'=252 sq. ft. @ $1.00. Rebuilt 1911		Same		Same	252	100	252	252			252	95	239	
No. 8 McGowan pump and boiler, erected complete including foundation		Same		Same	450	80	360	450			450	80	360	
Miscellaneous tools and supplies		Same		Same	50	80	40	50			50	80	40	
					3,122		2,922	3,052	70	2,136	3,122		2,815	
Seney:														
Tank 24'x16' (1887) new posts 1907, new roof 1904		Same		Same	1,870	80	1,496	2,000			1,870	80	1,496	
Pump house—shingle roof (1887)														
12'x14'x10' } 25[illegible] sq. ft. @ $1.00		Same		Same	252	60	151	252			252	60	151	
6'x14'x 6' }														
No. 8 McGowan pump and boiler including foundations		Same		Same	450	55	248	450			450	55	248	
Miscellaneous tools and supplies		Same		Same	40	80	32	40			40	80	32	
Water supply from Fox River, intake and suction		Same		Same	45	80	36	125			45	80	36	
					2,657		1,963	2,867	70	2,007	2,657		1,963	

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
			C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
CRESWTON:			$		$	$		$	$		$
Tank, 24'x16'—1887											
Pump house—1887—12½'x19'x10'—238 sq. ft. @ $1.00	Same	Same	1,870	60	1,122	2,000			1,870	60	1,122
No. 8 McGowan pump and boiler	Same	Same	238	60	143	238			238	60	143
Miscellaneous tools and supplies	Same	Same	450	55	248	450			450	55	248
Water supply—River, well and intake	Same	Same	40	80	32	40			40	80	32
	Same	Same	45	80	36	135			45	80	36
WETMORE:			2,643		1,581	2,863	70	2,004	2,643		1,581
Tank (1887) 24'x16'—New posts 1905, new roof and deck, 1904											
Water supply from Anna River, intake and suction	Same	Same	1,870	80	1,496	2,000			1,870	80	1,496
Pump house 12'x14'x10' } 252 sq. ft. @ $1.00	Same	Same	45	80	36	130			45	80	36
6'x14'x8' }	Same	Same	252	55	139	252			252	55	139
No. 8 McGowan pump and boiler on foundation	Same	Same	450	55	248	450			450	55	248
1—No. 8 McGowan boiler	Same	Removed	220	55	121	220					
Miscellaneous tools and supplies	Same	Same	50	80	40	50			50	80	40
AU TRAIN:			2,887		2,080	3,102	70	2,171	2,667		1,959
Tank, 24'x16'—1887—New posts, deck and shingles 1905											
Pump House 12'x14'x10' } 252 sq. ft. @ $1.00	Same	Same	1,870	80	1,496	2,000			1,870	80	1,496
6'x14'x8' }	Same	Same	252	60	151	252			252	60	151
No. 8 McGowan pump and boiler, including foundation	Same	Same	450	55	248	450			450	55	248
Water supply Au Train River, intake and suction	Same	Same	45	80	36	70			45	80	36
Miscellaneous tools and supplies	Same	Same	50	80	40	50			50	80	40
SAND RIVER:			2,667		1,971	2,822	70	1,975	2,667		1.971
Tank, standard, 16'x24'—1887—Carey roof, new posts, deck and roof, 1907											
Pump house	Same	Same	1,870	85	1,590	2,000			1,870	85	1,590
No. 8 McGowan pump and boiler, including foundation	Same	Removed	252	60	151	252					
Miscellaneous tools and supplies	Same	Same	450	55	248	450			450	55	248
Water supply from Grand River, intake and suction	Same	Same	50	80	40	50			50	80	40
	Same	Same	45	80	36	50			45	80	36
			2,667		2,065	2,802	70	1,961	2,415		1,914

St. Ignace to Soo Junction:											
St. Ignace:											
Tank, 24'x16'	Same	Same	1,870	70	1,309	2,000			1,870	70	1,309
Stand pipe	Same	Removed	700	70	490	700					
Pump house 14'x30'x12', 420 sq. ft. @ $1.00	Same	Same	420	70	294	420			420	70	294
(Water supply from city)	Same	Same									
			2,990		2,093	3,120	70	2,184	2,290		1,603
Bissell:											
Tank, standard, 16'x24'—1910	Same	Same	1,870	100	1,870	2,000			1,870	90	1,683
Pump house, moved from Dollarville	Same	Same	252	100	252	252			252	90	227
No. 8 McGowan pump and boiler, complete on foundation	Same	Same	450	100	450	450			450	90	405
Miscellaneous tools and supplies	Same	Same	40	100	40	40			40	90	36
Water supply	Same	Same	50	100	50	50			50	90	45
			2,662		2,662	2,792	90	2,513	2,662		2,396
Trout Lake:											
Tank, 24'x16'—1887	Same	Same	1,870	60	1,122	2,000			1,870	60	1,122
Pump house 12'x14'x10' \ 252 sq. ft. @ $1.00 6'x14'x 6' /	Same	Same	252	60	151	252			252	60	151
No. 8 McGowan pump and boiler, complete on foundation	Same	Same	450	50	225	450			450	50	225
Miscellaneous tools and supplies	Same	Same	50	80	40	50			50	80	40
Well and pipe line	Same	Same	500	80	400	500			500	80	400
			3,122		1,938	3,252	70	2,276	3,122		1,938
Total East of Marquette			41,059		32,758	41,450		29,571	37,637		30,304
Marquette to Nestoria:											
Marquette:											
Tank 18'x18'—1881—Lower Mackinaw yard, city water supply	Same	Rebuilt 1912, same tub with new concrete foundation	1,800	50	900	1,800	30	540	1,800	75	1,350
Tank 24'x16' shingle, 10 years old, upper yard	Same	Same	1,870	50	935	2,000	70	1,400	1,870	75	1,402
Pump house, 1887, frame, shingle roof	Same	Pump repair house (1887) frame, shingle roof, 3rd and Jackson St., 8'x10'—80 sq. ft. @ $1.00	252	50	126	252	70	176	80	60	48

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
			C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
			$		$	$		$	$		$
Stand pipe 8 ft. high, 8" discharge nozzle	None there		700	90	630						
Stand pipe 10 ft. high, 8" discharge nozzle (Upper yard, near engine house)	Same		700	90	630	700	70	490	700	90	630
			5,322		3,221	4,752		2,606	4,450		3,430
NEGAUNEE:											
Tank, standard, 16'x24'—1907—shingle roof, pile foundation, 2 spouts, 16 posts, city water supply	Same	Same	1,950	95	1,852	2,000			1,950	95	1,852
	Stand pipe					700					
			1,950		1,852	2,700	70	1,890	1,950		1,852
ISHPEMING:											
Tank 18'x16', general repairs, 1902 (City water supply to this tank)	Tank 18'x16'—1881—City Water supply	Same as 1911	1,800	80	1,440	1,800	70	1,260	1,800	80	1,440
Stand pipe		Stand pipe, 8" Dooge, concrete pit	700	80	560				700	80	560
Tank 15'x16', moved from Humboldt in 1901 (City water supply)	Tank 15'x16'—1881—City water supply	Same as 1911 (South Ishpeming)	1,700	60	850	1,700	70	1,190	1,700	50	850
			4,200		2,850	3,500		2,450	4,200		2,850
HUMBOLDT:											
Water tank, standard, 16'x24' (Old tank removed to South Ishpeming)	Same	Same	1,870	90	1,683	2,000			1,870	90	1,683
Pump house, frame, shingle roof (1880)											
$6\frac{1}{2}$'x20'x5' \ 442 sq. ft. @ $1.00	Same	Same	442	50	221	442			442	50	221
13' x24'x7' /	Same	Same	436	60	262	436			436	60	262
2—No. 8 McGowan pumps @ $218.00	Same	Same	360	60	216	360			350	60	216
1—Horizontal return tubular boiler, 30 H. P.	Same	Same	50	80	40	50			50	80	40
Miscellaneous tools and supplies	Same	Same	50	90	45	270			50	90	45
Water supply from River, intake and piping											
			3,208		2,467	3,558	70	2,491	3,208		2,467

MICHIGAMME:											
Tank, 24'x16', shingle roof—1907	Same	Same	1,870	95	1,776	2,000			1,870	95	1,776
Pump house 14½'x14½'x10'—210 sq. ft. @ $1.00 (1887—New posts, floor and beams to joists, 1906)	Same	Same	210	80	168	210			210	80	168
No. 8 McGowan pump and boiler	Same	Same	450	60	270	450			450	60	270
Stand pipe—Track, with pipe, angles and connections in place	Same	Stand pipe—8" Dooge, concrete pit, $700, joint with C. & N. W. —½ int.	700	60	420	700			350	60	210
Miscellaneous tools and supplies	Same	Same	50	80	40	50			50	80	40
Water supply from Lake Michigamme—Intake	Same	Same	45	80	36	45			45	80	36
			3,325		2,710	3,455	70	2,419	2,975		2,500
NESTORIA TO HOUGHTON:											
SUMMIT											
Tank, 16'x16'. The tank is there but not in use. The pump house, pumps, etc., have been removed. No value assigned to this old station.	Removed	Removed									
HERMAN:											
Tank 24'x16'—1902	Same		1,870	85	1,590	2,000			1,870	85	1,590
Spring house, spring and pipe line. Actual cost. Note:—The actual cost of entire installation in 1902 was $3,857	Same	1½ mi. Bay City, wood pipe, 4" inside diam. Actual cost	1,987	85	1,689	1,987			1,987	85	1,689
			3,857		3,279	3,987	70	2,791	3,857		3,279
L'ANGE:											
Pump house 10'x12'—120 sq. ft. @ $1.00	Pump house 12'x14' 168 sq. ft. @ $1.00	Same	120	50	60	168			200	50	100
Shed to house 8'x10'—80 sq. ft. @ $1.00	Same	Same	80	50	40	80					
Hydraulic ram 6"x2"	Same	Szme	125	90	112	125			125	90	112
Hydraulic ram 4"x2"	Same	Same	85	90	76	85			85	90	76
New hydraulic ram, 1901—6"x3"	Same	Same	125	90	112	125			125	90	112
350 ft. 4" pipe \ Extimated at $1.00 per ft. laid 300 ft. 6" pipe /	Same	Same	650	90	585	650			650	90	565
Standard tank (1903) 16'x24'	Same	Same	1,870	90	1,683	2,000			1,870	90	1,683
			3,055		2,668	3,233	70	2,263	3,055		2,668

Riggs—1911—Exhibit 1		Hansel—1912—Exhibit 15		Riggs—1913—Exhibit 1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
KEWEENAW BAY:					$		$	$		$	$		$
Tank 24'x16'—1899	$1,870	Same	$2,000										
Gravity supply 1¼ mi. of 4" pipe laid													
Pipe and joints 47c		Laid pipe and jts. 47c											
Excav. and fill 23		Excav. and fill 23											
70—6,600 ft. @ 70c	4,620	6,600 ft. @ 70c	4,620										
	$6,490		$6,620										
½ interest with Mineral Range R. R.		½ interest with Mineral Range R. R.		Same	3,245	80	2,596	3,310	70	2,317	3,245	80	2,596
HOUGHTON:													
Tank 16'x16', Carey roof (1911)		Same		Same	1,800	100	1,800	1,800			1,800	95	1,710
Pump house 1887— 6'x14'x7' / 14'x24'x9½' } 420 sq. ft. @ $1.00		Same		Same	420	60	252	420			420	60	252
Pump located in roundhouse, included in shop machinery and tools		Same		Same									
Water supply—Portage Lake		Same		Same	250	100	250	250			250	100	250
					2,470		2,302	2,470	70	1,729	2,470		2,212
CHASSELL:													
Tank 24'x16'		It was an error to show a water station at Chassell, as there has never been one there.			1,870	70	1,309						
Pump house					120	70	84						
Pump and boiler					450	70	315						
Miscellaneous tools and supplies					50	80	40						
Water supply from lake					45	80	36						
					2,535		1,784						
Total Marquette to Houghton					33,167		25,729	30,965		20,956	29,410		23,854
NESTORIA TO STATE LINE:													
VERMILAC:													
Tank, shingle roof, 24'x16'		Same		Same	1,870	85	1,590	2,000			1,870	85	1,590
Pump house, iron roof 6'x14'x6' / 12'8'14'x10' } 252 sq. ft.		Same		Same	252	85	214	252			252	85	214
(All had general repairs—1908)													

Water supply from Vermilac River, intake and piping	Same	Same	45	90	40	45			45	90	40
No. 8 McGowan boiler, pump and foundations	Same	Same	450	60	270	450			450	60	270
Miscellaneous tools and supplies	Same	Same	50	80	40	50			50	80	40
			2,667		2,154	2,797	70	1,958	2,667		2,154
SIDNAW:											
Tank 24'x16', Carey roof—Built 1887, Gen repairs 1907	Same	Same	1,870	85	1,590	2,000			1,870	85	1,590
Pump house 6'x14'x 6' \ 252 sq. ft. @ $1.00	Same	Same	252	60	151	252			252	60	151
12'x14'x10' /											
Water supply—Hill Creek, intake and piping	Same	Same	45	90	40	45			45	90	40
No. 8 McGowan Pump, boiler and foundation	Same	Same	450	60	270	450			450	60	270
Miscellaneous tools and supplies	Same	Same	50	80	40	50			50	80	40
			2,667		2,091	2,797	70	1,958	2,667		2,091
TROUT CREEK:		Same	1,870	82	1,533	2,000			1,870	82	1,533
Tank 24'x16', shingle roof, general repairs 1912	Same	Same	45	60	27	45			45	60	27
Water supply —Trout Creek, intake and pipe	Same	Same	252	80	202	252			252	80	202
Pump house 6'x14'x 6' \ 252 sq. ft. @ $1.00	Same										
12'x14'x10' /		Same	450	60	270	450			450	60	270
No. 8 McGowan pump and boiler, complete on foundation	Same		50	80	40	50			50	80	40
Miscellaneous tools and supplies			2,667		2,072	2,797	70	1,958	2,667		2,072
EWEN:											
Tank 24'x16', shingle roof—1887	Same	Same	1,870	60	1,122	2,000			1,870	60	1,122
Pump house 6'x14'x 6' \ 252 sq. ft. @ $1.00	Same	Same	252	60	151	252			252	60	151
12'x14'x10' /											
Water supply, river, intake and pipe	Same	Same	45	90	40	160			45	90	40
No. 8 McGowan pump and boiler on foundation	Same	Same	450	60	270	450			450	60	270
Miscellaneous tools and supplies	Same	Same	50	80	40	50			50	80	40
			2,667		1,623	2,912	70	2,038	2,667		1,623
LAKE GOGEBIC:											
Tank 24'x16'	Same	Same	1,870	65	1,216	2,000			1,870	65	1,216
Pump house 8½'x8½'x7' / 6'x14'x7' / 12'x14'x10' } 324 sq. ft. @ $1.00	Same	Same	324	80	259	324			324	80	259
Water supply—Lake Gogebic—Intake and pipe	Same	Same	45	80	36	45			45	80	36
Pump and boiler on foundation	Same	Same	450	65	292	450			450	65	292
Miscellaneous tools and supplies	Same	Same	50	80	40	50			50	80	40
			2,739		1,843	2,869	70	2,008	2,739		1,843

Riggs—1911—Exhibit 1		Hansel-1912-Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
				C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	PV.
THOMASTON:				$		$	$		$	$		$
Tank 24'x16' complete		Same	Same	1,870	80	1,496	2,000			1,870	80	14 96
Pump house 14'x20'—280 sq. ft. @	$1.00	Same	Same	280	80	224	280			280	80	224
Well 20'x20'x113' stone lined												
1,672 cu. yds excavation @ $1.50	2,508											
670 cu. yds. Stone wall @ $6.00	4,020											
Curbing, pipe, etc.	100											
	$6,628	Same	Same	6,628	80	5,302	6,628			6,628	80	5,302
Pump assumed to be included in shop machinery and tools.												
				8,778		7,022	8,908	70	6,236	8,778		7,022
NORTH BESSEMER:												
Tank, 1896—16'x16'x11'		Same	Tank 16'x24'	1,800	75	1,350	2,000			1,870	70	1,309
Spring house—12'x12'x6'—144 sq. ft. @ $1.00		Same	Same	144	75	108	144			144	75	108
Water supply—Spring, intake and piping		Same	Same	50	85	42	50			50	85	42
				1,994		1,500	2,194	70	1,536	2,064		1,450
Total Nestoria to State Line				24,179		18,305	25,274		17,692	24,249		18,264

RECAPITULATION

WATER STATIONS

	1911				1912				1913			
	C.R.	Total C.R.	P.V.	Total P.V.	C.R.	Total C.R.	P.V.	Total P.V.	C.R.	Total C.R.	P.V.	Total P.V.
EAST OF MARQUETTE:	$	$	$	$	$	$	$	$	$	$	$	$
Sault Ste. Marie	2,570		1,916		2,700		1,890		1,870		1,870	
Wellsburg	6,242		5,732		4,642		3,249		4,696		4,459	

Eckerman	2,937		2,323		3,287		2,301		2,937		2,323	
Soo Junction	3,893		3,512		4,149		2,904		3,893		3,512	
McMillan	3,122		2,912		3,052		2,136		3,122		2,815	
Seney	2,657		1,963		2,867		2,007		2,657		1,963	
Creighton	2,643		1,581		2,863		2,004		2,643		1,581	
Wetmore	2,887		2,080		3,102		2,171		2,667		1,959	
Au Train	2,667		1,971		2,822		1,975		2,667		1,971	
Sand River	2,667		2,065		2,802		1,961		2,415		1,914	
St. Ignace	2,990		2,093		3,120		2,184		2,290		1,603	
Bissell	2,662		2,662		2,792		2,513		2,662		2,396	
Trout Creek	3,122		1,938		3,252		2,276		3,122		1,938	
Total East of Marquette	41,059	41,059	32,758	32,758	41,450	41,450	29,571	29,571	37,637	37,637	30,304	30,304
MARQUETTE TO HOUGHTON:												
Marquette	5,322		3,221		4,752		2,606		4,450		3,430	
Negaunee	1,950		1,852		2,700		1,890		1,950		1,852	
Ishpeming	4,200		2,850		3,500		2,450		4,200		2,850	
Humboldt	3,208		2,467		3,558		2,491		3,208		2,467	
Michigamme	3,325		2,710		3,455		2,419		2,975		2,500	
Herman	3,857		3,279		3,987		2,791		3,857		3,279	
L'Anse	3,055		2,668		3,233		2,263		3,055		2,668	
Keweenaw Bay	3,245		2,596		3,310		2,317		3,245		2,596	
Houghton	2,470		2,302		2,470		1,729		2,470		2,212	
Chassell	2,535		1,784		0,000		0,000		0,000		0,000	
Total Marquette to Houghton	33,167	33,167	25,729	25,729	30,965	30,965	20,956	20,956	29,410	29,410	23,854	23,854
NESTORIA TO STATE LINE:												
Vermilac	2,667		2,154		2,797		1,958		2,667		2,154	
Sidnaw	2,667		2,091		2,797		1,958		2,667		2,091	
Trout Creek	2,667		2,072		2,797		1,958		2,667		2,072	
Ewen	2,667		1,623		2,912		2,038		2,667		1,623	
Lake Gogebic	2,739		1,843		2,869		2,008		2,739		1,843	
Thomaston	8,778		7,022		8,908		6,236		8,778		7,022	
North Bessemer	1,994		1,500		2,194		1,536		2,064		1,459	
Total Nestoria to State Line	24,179	24,179	18,305	18,305	25,274	25,274	17,692	17,692	24,249	24,249	18,264	18,264
Total in Michigan		98,405		76,792		97,689		68,219		91,296		72,422

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
			C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
			$		$	$		$	$		$
Side Tracks constructed for Coaling Stations are included in Schedule No. 16, Side Tracks, and are therefore eliminated from this schedule.		All items in the 1913 appraisal are Freight and Passenger except as noted.									
SAULT STE. MARIE Coaling Station:											
Embankment 1,000 c. y. @ $0.30	Embankment 100 c. y. @ $0.30	Coaling station, built by Soo Line.	300	100	300	30					
Timber 99.5 M.B.M. 43.64	Timber 99.5 M.B.M. 38.00	Fairbanks-Morse Co., two pocket	4,342	65	2,822	3,781					
Air hoist, derricks and coal house	Same	frame, concrete block house 14'x14'	800	75	600	800					
Coal buckets, ½ ton capacity	Coal buckets, ½ ton capacity	for elevating machinery, weighing									
weight 400 lbs 16 @ 40.00	weight 400 lbs 16 18.00	apparatus, hopper at rear under coal	640	80	512	288					
Total		track—Actual cost $6,650. ½ interest—$3,325.	6,082		4,234	4,899	65	3,184	3,325	100	3,325
ST. IGNACE—Coal Shed:											
Timber 158.5 M.B.M. @ 43.65	Timber 158.5 M.B.M. @ $38.00	Same as 1911	6,917	65	4,496	6,023			6,917	65	4,496
Derricks, complete with ropes											
and clips 2 55.00	Same	Same	110	88	110				110	80	88
Coal buckets 24 40.00	Coal buckets 24 18.00	Coal buckets 24 15.00	960	80	768	432			360	80	288
Coal bucket cars 6 8.00	Same	Same	48	80	38	48			48	80	38
Miscellaneous	Same	Same	140	75	105	140			140	75	105
Total			8,175		5,495	6,753	65	4,389	7,575		5,015
SOO JUNCTION—Coal Shed											
Timber 49.9 M.B.M. @ $43.64	Timber 49.9 M.B.M. @ $38.00	Same as 1911	2,178	65	1,416	1,896			2,178	65	1,416
Hand hoist complete	Same	Same	55	75	41	55			55	75	41
Coal bucket' 15 40.00	Coal buckets 15 18.00	Coal buckets 15 @ $15.00	600	80	480	270			225	80	180
Steel plate 643 lbs 0.03½	Same	Same	22	90	20	22			22	90	20
Total			2,855		1,957	2,243	65	1,458	2,480		1,657

SENEY—Coal Shed																					
Timber	213.8 M.B.M.	@ $43.64	Timber	213.8 M.B.M.	@ $38.00	Same as 1911					9,330	65	6,064	8,124			9,330	65	6,064
Coal buckets	21	40.00	Coal buckets	21	18.00	Coal buckets	21	@ $15.00			840	80	672	378			315	80	252
Hand hoists, complete	2	55.00	Same			Same					110	75	83	110			110	75	83
Coal bucket cars	3	8.00	Same			Same					24	80	19	24			24	80	19
Miscellaneous			Same			Same					143	75	107	143			143	75	107
Total											10,447		6,945	8,779	65	5,706	9,922		6,525
SAND RIVER—Coaling Station																					
Timber	124.3 M.B.M.	@ $43.64	Timber	124.3 M.B.M.	@ $38.00	Same as 1911					5,424	65	3,526	4,723			5,424	65	3,526
Coal buckets	16	40.00	Coal buckets	16	18.00	Coal buckets	16	@ $15.00			640	80	512	288			240	80	192
Standard derrick			Same			Same					55	70	38	55			55	70	38
Coal bucket cars	2	8.00	Same			Same					16	80	13	16			16	80	13
Miscellaneous			Same			Same					95	75	71	95			95	75	71
Total											6,230		4,160	5,177	65	3,365	5,830		3,840
MARQUETTE—Coaling Station:																					
Concrete in floors	800 c. y.	@ $10.50	Concrete	86.5 c. y.	@ $8.00	Same as 1911					8,400	90	7,560	6,920			8,400	90	7,560
Concrete in abutments	6.5 c. y.	9.00	Same			Same as 1911					585	90	526				585	90	526
Timber	33.3 M. B.M.	43.64	Timber	39.0 M.B.M.	38.00	Same as 1911					14,532	80	11,626	14,820			14,532	80	11,626
Standard derricks	4	55.00				Standard derricks	2	@ $55.00			220	85	187	220			110	85	94
Buckets	40	40.00	Buckets	40	18.00	Buckets	40	15.00			1,600	85	1,360	720			600	85	510
Bucket cars	4	8.00	Same			Same					32	85	27	32			32	85	27
Miscellaneous			Same			Same					462	75	347	462			462	75	347
			Additions 1912			Coal pockets, 2 sets, built 1912, actual cost								1,630			3,006	100	3,006
			Shown in shop, machinery and tools			Locomotice crane for filling pockets, 12 tons capacity, 1912, actual cost installed, including clam shell bucket											6,995	100	6,995
Total											25,831		21,633	24,804	75	18,603	34,722		30,691
SOUTH ISHPEMING—Coaling Station																					
Timber	14.8 M.B.M.	@ $43.64	Timber	14.8 M.B.M.	@ $38.00	Same as I911			Ore		646	65	420	562			646	65	420
Standard derrick			Same			Same			Ore		55	70	38	55			55	70	38
Buckets	9	40.00	Buckets	9	18.00	Buckets	9	@ $15.00	Ore		360	80	288	162			135	80	108
Total											1,061		746	779	65	506	836		566

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
			C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
			$		$	$		$	$		$
REPUBLIC—Coaling Station											
Timber 8.0 M. B. M. @ $43.64	Timber 8.0 M.B.M. @ $38.00	Same as 1911 Freight	349	65	227	304			349	65	227
Standard derrick	Same	Same Freight	55	70	38	55			55	70	38
Buckets 9 40.00	Buckets 9 18.00	Buckets 9 @ $15.00 Freight	360	80	288	162			135	80	108
Total			764		553	521	65	339	539		373
MICHIGAMME—Coaling Station											
Timber 9.4 M.B.M. @ $43.64	Timber 9.4 M.B.M. @ $38.00	Same as 1911	410	65	267	357			410	65	267
Standard derrick	Same	Same	55	70	38	55			55	70	38
Buckets 9 40.00	Buckets 9 18.00	Buckets 9 @ $15.00	360	80	288	162			135	80	108
Total			825		593	574	65	373	600		413
NESTORIA—Coaling Station:											
Timber 284.6 M.B.M. @ $43.64	Timber 284.6 M.B.M. @ $38.00	Same as 1911	12,420	75	9,315	10,815			12,420	75	9,315
Derrick with air hoist complete	Same	Same	150	80	120	150			150	80	120
Buckets 22 40.00	Buckets 22 18.00	Buckets 22 @ $15.00	880	80	704	396			330	80	264
Bucket cars 5 8.00	Same	Same	40	80	32	40			40	80	32
Miscellaneous	Same	Same	224	75	168	224			224	75	168
Total			13,714		10,339	11,625	75	8,719	13,164		9,899
L'ANSE—Coaling Station:											
Timber 63.7 M.B.M. @ $43.64	Timber 63.7 M.B.M. @ $38.00	Same as 1911	2,780	65	1,807	2,420			2,780	65	1,807
Standard derrick	Same	Same	55	70	38	55			55	70	38
Buckets 13 40.00	Buckets 13 18.00	Buckets 13 @ $15.00	520	80	416	234			195	80	156
Bucket cars 2 8.00	Same	Same	16	80	13	16			16	80	13
Miscellaneous	Same	Same	35	75	26	35			35	75	26
Total			3,406		3,200	2,760	65	1,794	3,081		2,040

HOUGHTON—Coaling Station:																				
Timber	32.4 M.B.M. @ $43.64		Timber	32.4 M.B.M. @ $38.00		Same			1,414	65	919	1,231			1,414	65	919		
Standard derrick			Same			Same			55	70	38	55			55	70	38		
Buckets	16	40.00	Buckets	16	18.00	Buckets	16	@ $15.00	640	80	512	288			240	80	192		
Total									2,109		1,469	1,574	65	1,023	1,709		1,149		
EWEN—Coal Shed:																				
Timber	144.7 M.B.M. @ $43.64		Timber	144.7 M.B.M. @ $38.00		Same as 1911			6,315	75	4,736	5,498			6,315	75	4,736		
Standard hoist			Same			Same			55	80	44	55			55	80	44		
Buckets	18	40.00	Buckets	18	18.00	Buckets	18	@ $15.00	720	80	576	324			270	80	216		
Bucket cars	14	8.00	Same			Same			112	80	90	112			112	80	90		
Miscellaneous			Same			Same			119	75	89	119			119	75	89		
Total									7,321		5,535	6,108	60	3,665	6,871		5,175		
THOMASTON—Coaling Station:																				
Timber	247.8 M.B.M. @ $43.64		Timber	247.8 M.B.M. @ $38.00		Same as 1911			10,814	80	8,651	9,416			10,814	80	8,651		
Standard derrick with air hoist			Same			Same			150	90	135	150			150	90	135		
Buckets	21	40.00	Buckets	21	18.00	Buckets	21	@ $15.00	840	85	714	378			315	85	268		
Total									11,804		9,500	9,944	75	7,458	11,279		9,054		

LOCATION	1911		1912		1913	
	C. R.	P. V.	C. R.	P. V.	C. R.	P. V.
	$	$	$	$	$	$
Sault Ste. Marie	6,082	4,234	4,899	3,184	3,325	3,325
St. Ignace	8,175	5,495	6,753	4,389	7,575	5,015
Soo Junction	2,855	1,957	2,243	1,458	2,480	1,657
Seney	10,447	6,945	8,779	5,706	9,922	6,525
Sand River	6,230	4,160	5,177	3,365	5,830	3,840
Marquette	25,831	21,633	24,804	18,603	34,722	30,691
Ishpeming (South)	1,061	746	779	506	836	566
Republic	764	533	521	339	539	373
Michigamme	825	593	574	373	600	413
Nestoria	13,714	10,339	11,625	8,719	13,164	9,899
L'Anse	3,406	2,300	2,760	1,794	3,081	2,040
Houghton	2,109	1,469	1,574	1,023	1,709	1,149
Ewen	7,321	5,535	6,108	3,665	6,871	5,175
Thomaston	11,804	9,500	9,944	7,458	11,279	9,054
Total in Michigan	100,624	75,459	86,540	60,582	101,933	79,722
Allocated, 1913:						
Freight and Passenger					100,558	78,783
Freight					539	373
Ore					836	566

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
	The tracks on these docks are eliminated from this schedule and included under Side Tracks.	Same note as in 1911										
MARQUETTE: Track material and labor cut out of Docks and Wharves Schedule and included under Sidetracks, Schedule No. 16. Items of actual cost for freight charges and engineering disregarded here by reason of inclusion of freight charges in unit prices and engineering in a general percentage charge.												
IRON ORE DOCK NO. 1: This structure, which was given a reproduction cost of $318,333 and a present value of $193,207 in 1900, has been dismantled, and during the years 1910-11 large credits to capital appear by reason of such abandonment. The pile foundations are all in place. Considerable timber is as yet in position and much of the iron work is on hand. There remains value: (a) Contingent on future use of the pile foundations which are sound. (b) Scrap value of material not yet removed. We assign, by reason of both these elements, a value of	No value allowed	No value allowed		50,000	50	25,000						

Iron Ore Dock No. 2. No change since 1900. Abandoned as iron ore dock in 1892 and used as a general merchandise dock and steamer wharf. No value assigned as ore dock.	No value allowed	No value allowed											
Iron Ore Dock No. 3: In 1900 was being dismantled and was there assigned reproduction value of $27,388, and a present value of $9,129, which values now disappear. This structure has been replaced by Iron Ore Dock No. 5, on the same site. Dock No. 3 therefore entirely disappears.	No value allowed	No value allowed											
Iron Ore Dock No. 4: Remains as reported in 1900. Large expenditures having been made for maintenance and upkeep. The dock is in daily use.		Total as per Exhibit 1	Ore								315,478	25	78,870
Dock and Approaches.	Iron Ore Dock No. 4—Including Approaches:												
111,775 lin. ft. piling in place @ 40c per lin. ft.	111,800 lin. ft. piling in place @ $ 0.30			44,710	70	31,297	33,540						
4,130,000 F.B.M. timber in place @ $43.64 per M. B. M.	4,046 M.B.M. timber in place @ 38.00			180,233	50	90,117	153,748						
523,141 lbs. rods, bolts and iron in place @ 3½c per lb.	528,200 lbs. rods, bolts, and iron in place 0.035			18,310	75	13,732	18,487						
200 Denton hoists @ $160.00				32,000	75	24,000	32,000						
200 steel chutes and fixtures @ $117.00				23,400	75	17,550							
Water system—1,730 ft. 4" pipe in place				1,278	75	958	1,278						
Electric lighting on dock				2,200	80	1,760	2,200						
Coal chute	Miscellaneous tools			500	50	250	250						
Stairways				486	50	243							
Foreman's house 10'x24'—240 sq. ft. @ $1.00				240	50	120							
Dredging—actual cost				12,121	100	12,121	12,121						
Total				315,478	*61	192,148	253,624	40	101,450	315,478	25	78,870	

* Computed

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911				1912			1913		
			Allocation	C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				$		$	$		$	$		$
IRON ORE DOCK No. 5:												
On site of Old Dock No. 3.	Including Approaches	Total cost of reproduction Per Exhibit 1	Ore							496,091	80	396,873
Labor overhauling old foundation and clearing of site—actual cost				1,088	100	1,088						
Inspection—actual cost	160,000 lin ft.			3,394	100	3,394						
Piling, 159,865 lin. ft. in place $ 0.40	in place @ $ 0.30			63,946	85	54,354	48,000					
Timber, 6,678,750 F.B.M. in place 43.64	6,608 M.B.M. in place 38.00			291,461	80	233,169	251,104					
Rods, bolts and iron in place 661,916 lbs 0.035	656,000 lbs 0.035			23,167	85	19,692	22,960					
Hoists and fixtures	Same			55,622	85	47,279	55,622					
Spouts	Same			35,117	80	28,094	35,117					
Water system	Same			1,858	80	1,486	1,858					
Electric lights	Poles			202	90	182	202					
Dredging	Same			18,936	100	18,936	18,936					
Miscellaneous	Rock fill, miscellaneous tools, etc.			1,300	80	1,040	1,250					
Omitted	Plate girder over Front St. and viaduct over Lake St. 296,000 lbs. steel @ $0.04						11,840					
	Concrete fastings for tower and excavation for same 24 c. y. @ $10.00						240					
	Omitted	Rest room and office 14'x36' built 1906	Ore							350	80	280
Total Dock No. 5				496,091		408,714	447,129	75	325,347	496,441		397,153
Pier 42'x1,100'—Pile and timber construction		(This item is included exactly as included by Mr. Hutchinson in the 1900 Cooley appraisal for the reason that it is of value in protecting the bank	F.	30,800	07	2,156				30,800	07	2,156
Trestle approach			F.	468	10	47				468	10	47
Crib—rock filled—10'x10'x550'—Timber and stone			F.	6,050	60	3,630				6,050	60	3,630

Merchandise Pier—Pile and timber construction		from wash, and if it were not there would necessitate a large amount of rip rap).	F.	54,614	40	21,846				54,614	25	13,654
Wharf, 18'x420'			F.	5,040	25	1,260				5,040	25	1,260
Revetment—Pile and timber construction—180 ft.			F.	1,440	35	504				1,440	35	538
Coal dock—90'x1,053'			F.	63,180	20	12,636				63,180	10	6,318
Dock—Pile and timber consruction—20'x200'			F.	2,667	20	533				2,667	20	533
Dredging			F.	59,000	100	59,000				59,000	100	59,000
Freight warehouse			F.	4,795	35	1,678				4,795	35	1,678
Omitted	Omitted	Coal dock office 12'x12'								200	75	150
Total Miscellaneous Docks				228,054		103,290				228,254		88,930
Dock No. 1				50,000		25,000						
Dock No. 4				315,478		192,148	253,624		101,450	315,478		78,870
Dock No. 5				496,091		408,714	447,129		325,347	496,441		397,153
Total at Marquette				1,089,623		729,152	700,753		426,797	1040,173		564,953
BARAGA:												
New ferry dock—actual cost			F.& P.	750	100	750	750	100	750	750	90	675
HOUGHTON:												
Revetment, in front of station, rip-rap	Same	Total as per Exhibit 1	F.& P.	500	40	200	500	40	200	2,884		1,710
Trestle	Same			1,584	60	950	1,584	60	950			
Dock—actual cost	Same			800	70	560	800	70	560			
Total at Houghton				2,884		1,710	2,884		1,710	2,884		1,710
ST. IGNACE:												
Revetment and fill, pile and timber construction	Same	Same	F.	1,979	30	594	1,979	30	594	1,979	30	594
Approach fill and timber revetment	Same	Same	F.	322	40	129	322	40	129	322	40	129
Foot walk, pile and timber construction	Same	Same	Pass.	1,100	65	715	1,100	65	715	1,100	65	715
Merchandise pier	Same	Same	F.	61,164	30	18,349	61,165	30	18,349	61,164	30	18,349
Lumber pier	Same	Same	F.	10,970	25	2,742	10,970	25	2,742	10,970	25	2,742
Lumber and coal pier, exclusive of pile foundation for coal pockets	Same	Same	F.	27,884	30	8,365	27,884	30	8,365	27,884	30	8,365
Approach to pier	Same		F.	992	40	397	992	40	397	992	40	397
Freight wa rehouse 30'x313'	Same		F.	3,662	80	2,930	3,662	80	2,930	3,662	80	2,930
Car ferry dock—Guide wing, double row piles	Same	Total as per Exhibit 1	F.& P.	5,824	60	3,494	5,824	60	3,494	40,540		24,581
Anchorage for guide wings	Same			1,973	60	1,184	1,973	60	1,184			

Riggs—1913—Exhibit 1-A				Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
							$		$	$		$	$		$
Relay slip															
Approach pier				Same			2,193	40	877	2,193	40	877			
Approach fill				Same			21,160	60	12,696	21,160	60	12,696			
Plank extension to approach pier				Same			1,683	50	842	1,683	50	842			
Trestle platform				Same			550	50	275	550	50	275			
Apron deck, main girders and transform beam—Actual cost							1,608	50	804	1,608	55	884			
Gallows frame and foundation							1,500	80	1,200	1,500	80	1,200			
Hinge support							700	80	560	700	80	560			
Apron guard							553	80	442	553	80	442			
Platform							397	80	318	397	80	318			
Rods, bolts, counterweights and iron in place							300	70	210	300	70	210			
Electric lights on dock							1,674	80	1,339	1,674	80	1,339			
							425	70	340	425	80	340			
Total at St. Ignace							148,613		58,802	148,614		58,882	148,613		58,802
MACKINAC TRANSPORTATION CO.:				The same items are shown in the Appendix.											
Coal pockets, timber and piles	$17,743	50	88,72												
Buckets	1,100	30	350												
Dump car track and switches	341	75	256 280												
Dump cars	525		280												
Derrick hoists	2,000	50	1,000												
Hoisting plant	1,265	75	949												
	22,974		11,687												
D., S. S. & A. R'y, ½ interest.					Same as 1911		7,658		3,896				7,658		3,896

LOCATION	1911		1912		1913	
	C.R.	P. V.	C. R.	P. V.	C. R.	P. V.
Marquette	1,089,623	729,152	700,353	426,797	1,040,173	654,953
Baraga	750	750	750	750	750	675
Houghton	2,884	1,710	2,884	1,710	2,884	1,710
St. Ignace	148,613	58,802	148,614	58,882	148,613	58,802
Mackinac Trans. Co.	7,658	3,896			7,658	3,896
Total in Michigan	1,249,528	794,310	853,001	488,139	1,200,078	630,036

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS

Schedule No. 27
ELECTRIC PLANTS

Riggs—1911—Exhibit 1		Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
				C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				$		$	$		$	$		$
MACHINERY:												
1—70 K. W. direct connected set consisting of A. C. generator, 240 volts, 156 ampere, 2 phase, 60 cycle, 277 r. p. m., including 10 K. W. exciter and one 100 H. P. Ideal engine 11½"x14" @ $50 per K. W.			Total as per Exhibit 1—page 242 This plant is at Marquette Shops and furnished current for lighting shops and yards. Freight and Passenger							9,607		8,855
Foundations and labor of erection of above set		Same—erected complete		350	90	3,15	4,130	90	3,717			
Steam and exhaust piping		Included above		350	90	315						
1—2 panel switchboard erected complete		Included above		280	90	252						
		1—Panel switchboard erected complete		1,200	100	1,200	1,200	95	1,140			
1—50 light mercury arc rectifier with a constant current transformer		Same		1,250	100	1,250	1,250	95	1,187			
1—30 K. W. 2 phase transformer, 60 cycle		Included below		221	100	221						
2—Lighting arresters		Included below		9	100	9						
16—40 ft. poles erected	@ $7.92	Included below		127	90	114						
105—30 ft. poles erected	5.17	Included below		543	75	407						
27—25 ft. poles erected	4.00	Included below		108	75	81						
199—Wood cross arms erected	.47	Included below		94	65	61						
436—Glass insulators in place	0.04	Included below		17	100	17						
1,890 ft. guy wire in place	0.03	Included below		57	100	57						
9 guy rods in place	0.60	Included below		5	100	5						
24 arc lamps erected	31.80	24 arc lamps and distribution line complete		763	90	687	3,027	90	2,724			
4,420 pounds of No. 6 W. P. copper wire	18½	Included above		818	95	777						
Labor of erection of 4,420 pounds of wire	0.06	Included above		265	95	252						
Total in Michigan				9,607		8,855	9,607		8,768	9,607		8,855

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
SAULT STE. MARIE TO MARQUETTE				$		$	$		$	$		$
SAULT STE. MARIE:												
Tool house 12'x12'x7' B. & B. 1887—144 sq. ft. @ 90c	Same	Tool house—10'x12'x7'—120 sq. ft. @ 90c—$108—½ interest	F.& P.	130	50	65	130	50	65	54	50	27
Tool house 12'x12'x8'—1901—144 sq. ft. @ 90c	Tool house 10'x12'x8'—120 sq. ft. @ 90c	Tool house—10'x12'x7'—120 sq. ft. @ 90c—$108—½ interest	F.& P.	130	80	104	108	80	86	54	75	40
The standard tool house has shingle roof, B. & B. sides, double doors—2 windows	Same											
Yard master's office—frame shingle roof, 1902—16'x 24'x12'—384 sq. ft. @ $1.25	Same except 384 sq. ft. @$1	Transferred to station building schedule		480	90	432	384	80	307			
Toilet (yard) 1902—4'x6'x6'—24 sq. ft. @ $1.25	Same	Water closet—4½'x4'x7'—18 sq. ft. @ $1.25—$22—½interest	F.& P.	30	80	24	30	80	24	11	70	8
Coal house—1889	Same	Removed		25	50	12	25	50	12			
Ice house—frame, shingle roof—built in 1900—26'x76'x 18'—1,976 sq. ft. @ $1.00	Same	Same—$1,976—½ interest	F.& P.	1,976	85	1,680	1,976	80	1,581	988	85	840
Flag house—frame, shingle roof 6'x6'x7'—36 sq. ft. @$2	Same	Same—$72—½ interest	F.& P.	72	80	58	72	80	58	36	80	29
Oil house—R. R. R. roof—10'x12'x8'—120 sq. ft. @ $1.50	Same	Transferred to shops, Eng. houses, etc.		180	80	144	180	80	144			
Stock yard chute (double)	Same	Same—$50—½ interest	F.	50	60	30	50	60	30	25	60	15
Stock yards 50'x200'—10,000 sq. ft. @ 3c	Same	Same—$300—½ interest	F.	300	60	180	300	60	180	150	60	90
Cement block factory, 1908	Same	Should have been in Marquette		875	90	788	875	90	788			
Custom house—1907	Same	Transferred to station building schedule		370	95	352	370	90	333			
Omitted	Omitted	Switchman's house—9'x9'x7'—81 sq. ft. @$1.25—$101—½ interest	F.& P.							50	75	38
Omitted	Omitted	Lamp house—10'x12'x7'—120 sq. ft. @ $1.25—$150—½ interest	F.& P.							75	75	56
Omitted	Omitted	Tool house—½ box car—$70—½ interest	F.							35	75	26
Included in shops, engine houses, etc.	Included in shops, engine houses, etc.	Track scales, 1904—rebuilt 1901—36 ft. @ $35—½ interest	F.							630	50	315
Omitted	Omitted	Scale house—4'x8'x7' @ $1.50—½ int.	F.							24	80	19
BAYSHORE:												
Section house—frame and shingle roof, 1887—24'x28'x 16'—672 sq. ft. @ $2.00	Same	Same	F.& P.	1,344	65	874	1,344	65	874	1,344	65	874

Tool house—log, B. & B. roof, 10'x13'x6'—130 sq. ft. @ 90c	Same	Same	F.& P.	117	70	82	117	70	82	117	70	82
Tool house—frame, B. & B. roof, 11'x16'x6'—176 sq. ft. @ 90c	Same	Same	F.& P.	158	70	111	158	70	111	158	70	111
2 toilets—frame, 4'x5'—1887 and 1889—@ $30.00	Same	Same	F.& P.	60	50	30	60	50	30	60	50	30
WELLSBURG:												
Section house 24'x28'x16'—annex 13'x16'x7'—880 sq. ft. @ $2.00—frame, shingle roof, 1887	Same	Same	F.& P.	1,760	65	1,144	1,760	65	1,144	1,760	65	1,144
Tool house—log, B. & B. roof, 11'x13'x7'—143 sq. ft. @ 90c	Same	Same	F.& P.	129	50	64	129	50	64	129	50	64
Toilet, B. & B., 4'x4'x6'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Telegraph office—frame, shingle roof, 9'x9'x7'—81 sq. ft. @ $1.25	Included in Station Building Schedule, page 561.	Transferred to Station Building Schedule		101	80	81						
REXFORD:												
Section house—frame, shingle roof, 1887—24'x28'x16'—672 sq. ft. @ $2.00	Same	Same	F.& P.	1,344	65	874	1,344	65	874	1,344	65	874
Tool house—1887—B. & B.—12'x14'x6'—168 sq. ft. @ 90c	Same	Same	F.& P.	151	50	76	151	50	76	151	50	76
1 dug well, 3'x3'x26' deep	Same	Same	F.& P.	59	90	53	59	90	53	59	90	53
1 driven well 27 feet	Same	Same	F.& P.	34	90	31	34	90	31	34	90	31
Water closet, 4'x4'x7'—B. & B.	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
STRONG:												
Tool house—B. & B., 13'x18'x6½'—234 sq. ft. @ 90c	Same	Same	F.& P.	211	50	106	211	50	106	211	50	106
ECKERMAN:												
Section house 22'x28'x16'—annex 12'x14'x9'—784 sq. ft. @ $2.00—frame, shingle roof, 1887	Same	Same	F.& P.	1,568	65	1,019	1,568	65	1,019	1,568	65	1,019
Well	Same	Same	F.& P.	50	100	50	50	90	45	50	100	50
Tool house—1907—10'x14'x7'—140 sq. ft. @ 90c	Same	Same	F. &P.	126	90	113	126	90	113	126	90	113
HULBERT:												
Section house—frame, shingle roof, 1909—18'x24'x17'—432 sq. ft. @ $2.00	Same	Same	F.& P.	864	100	864	864	95	821	864	95	821
Toilet, 4'x6'	Same	Same	F.& P.	30	90	27	30	90	27	30	90	27
Well	Same	Same	F.& P.	50	100	50	50	100	50	50	100	50
Omitted	Omitted	Section tool house—½ box car	F.& P.							75	60	45

MISCELLANEOUS STRUCTURES—Continued

Riggs—1911—Exhibit 1	Hansel—1911—Exhibit 15	Riggs—1912—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
Soo Junction:												
Section house—frame, shingle roof, 1902—24'x40'x18' 960 sq. ft. @ $2.00	Same	Same	V.& P.	1,920	70	1,344	1,920	70	1,344	1,920	70	1,344
Barn—no record of size	Same	Same	V.& P.	50	70	35	50	70	35	50	70	35
Cellar—dug out—1902	Same	Same	V.& P.	25	85	21	25	85	21	25	85	21
Track scales—1906—36 sq. ft. @ $35.00	Same	Same	V.	1,260	95	1,197	1,260	90	1,134	1,260	95	1,197
Toilet, 5'x8'x7'—1887	3 toilets @ $30	Same as 1911	V.& P.	30	50	15	90	60	54	30	50	15
Coal house—9'x9'x6'—1887	Same	Same	V.& P.	36	50	18	36	50	18	36	50	18
Tool house—1887—12½'x16'x7'—200 sq. ft. @ 90c	Same	Same	V.& P.	180	50	90	180	50	90	180	50	90
Toilet—1900—B. & B., 4'x6'x6'	Included above	Same	V.& P.	30	75	22				30	75	22
Toilet—1892—4'x7'	Included above	Same	V.& P.	30	50	15				30	50	15
Tool house—1891—B. &. B., 12½'x15½'x7'—194 sq. ft. @ 90c	Same	Same	V.& P.	175	50	88	175	50	88	175	50	88
Iron house—1887—shingle roof—moved from Soo in '03—12'x12'x7'—144 sq. ft.	Same	Same	V.& P.	70	50	35	70	50	35	70	50	35
Omitted	Omitted	Oil house—⅓ box car	V.& P.							75	50	38
Sage:												
Section house—frame, shingle roof, 1881—general repairs, 1903—10'x12'x8, and 16'x24'x16'—504 sq. ft. @ $2.00	Same	Same	V.& P.	1,008	50	504	1,008	50	504	1,008	50	504
Tool house—1902—B. & B.—10'x14'x7'—140 sq. ft. @ 90c	Same	Same	V.& P.	126	80	101	126	80	101	126	80	101
Toilet—1895—4'x4'x6'	Same	Same	V.& P.	30	60	18	30	60	18	30	60	18
Newberry:												
Section house—frame, shingle roof—10'x24'x9', 10'x24'x6', 16'x24'x14'—1056 sq. ft. @ $2.00	Same	Same	V.& P.	2,112	50	1,056	2,112	60	1,267	2,112	50	1,056
Toilet—1881—6½'x9½'x7'	2 toilets	Same	V.& P.	50	50	25	80	50	40	50	50	25
Block shanty—1910—4'x18'—72 sq. ft. @ 90c	Omitted	Same	V.	65	100	65				65	95	62
Toilet—1881—B. & B.—4'x4'x6'	Included above	Same	V.& P.	30	50	15				30	50	15
Tool house—1881—11'x13'x7'—143 sq. ft. @ 90c	Same	Same	V.& P.	129	50	64	129	50	64	129	50	64
Agent's house—frame, shingle roof—repaired and painted 1906—12½'x16½'x8' and 20½'x26½'x17'—750 sq. ft. @ $2.00	Same	Same	V.& P.	1,500	75	1,125	1,500	75	1,125	1,500	75	1,125

Tool house—1881—10'x13'x7'—130 sq. ft. @ 90c	Same	Same	F.& P.	117	50	58	117	50	58	117	50	58
Lineman's store house—1907—12'x15'x18'—180 sq. ft. @ 90c	Same	Same	F.& P.	162	95	154	162	95	154	162	95	154
Loading chute and stock yard	Same	Same	F.	40	50	20	40	50	20	40	50	20
DOLLARVILLE:												
Toilet—frame, shingle roof, 1881—6'x8'x6'	Same	Same	F.& P.	50	50	25	50	50	25	50	50	25
Stock shanty—1881—4'x10'—76 sq. ft. @ 90c	Omitted	Same	F.	68	50	34				68	50	34
Stock chute	Same	Same	F.	25	50	12	25	50	12	25	50	12
McMILLAN:												
Section house—1906—frame, shingle roof, 12'x24'x8', 18'x24'x16'—720 sq. ft. @ $2.00	Same	Same	F.& P.	1,440	95	1,368	1,440	90	1,296	1,440	95	1,368
Toilet—1911—5'x6'x7'	2 toilets @ $30	Same	F.& P.	30	100	30	60	90	54	30	95	28
Section tool house, 1906—10'x12'x8'—120 sq. ft. @ 90c	Same	Same	F.& P.	108	95	103	108	90	97	108	95	103
Lamp house—logs, shingle roof, 1900—9'x11'x5'—99 sq. ft. @ 90c	Same	Same	F.& P.	89	85	76	89	85	76	89	85	79
Toilet—1906—shingle roof—5'x6'x8'	Included above	Same	F.& P.	30	90	27				30	90	27
LARETON:												
Section house, 1906—frame, shingle roof—18'x24'x16', 12'x24'x8'—720 sq. ft. @ $2.00	Same	Same	F.& P.	1,440	95	1,368	1,440	90	1,296	1,440	95	1,368
Section tool house—1892—B. & B. roof—10'x15'x7'—150 sq. ft. @ 90c	Same	Same	F.& P.	135	60	81	135	60	81	135	60	81
Toilet—1906—5'x5x6'	Same	Same	F.& P.	30	90	27	30	90	27	30	90	27
SENEY:												
Section house—shingle roof—general repairs 1901—18'x25'x13', 9'x12½'x8'—562 sq. ft. @ $2.00	Same	Same	F.& P.	1,124	80	899	1,124	80	899	1,124	80	899
Coal house, 10'x12'	Same	Same	F.& P.	40	60	24	40	60	24	40	60	24
Tool house—10'x12'x7'—120 sq. ft. @ 90c	Same	Same	F.& P.	108	60	65	108	60	65	108	60	65
Toilet—4'x4'x6'—1881	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Stock chute	Same	Same	F.	25	50	12	25	50	12	25	50	12
DRIGGS:												
Section house, 1881—shingle roof—10'x24'x8' and 18'x 24'x14'—672 sq. ft. @ $2.00	Same	Same	F.& P.	1,344	55	739	1,344	55	739	1,344	55	739
Tool house, 1881—B. & B. roof—12'x16'x8'—192 sq. ft. @ 90c	Same	Same	F.& P.	173	50	86	173	50	86	173	50	86
Toilet—1881—B. & B.—4'x4'x6'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Wood house—1881—11'x5'x8'	Same	Same	F.& P.	40	50	20	40	50	20	40	50	20

Riggs—1911—Exhibit 1	Hansel—1911—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
CREIGHTON:												
Section house, 1881—shingle roof—general repairs 1902—18'x24'x14', 10'x24'x8'—672 sq. ft. @ $2.00	Same	Same	F.& P.	1,344	60	806	1,344	60	806	1,344	60	806
Tool house—log, B. & B. roof, 1905—15'x18'x7—270 sq. ft. @ 50c	Same	Same	F.& P.	135	90	122	135	90	122	135	90	122
Tool house—log, B. & B. roof, 1900—12'x18'x6½'—216 sq. ft. @ 50c	Same	Same	F.& P.	108	85	92	108	85	92	108	85	92
Toilet—1881—5'x5'x6'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
SHINGLETON:												
Section house—12'x14'x6'—18'x24'x14'—kitchen (1909) 10½'x12½'x7'—600 sq. ft. @ $2.00	731 sq. ft. @ $2.00	Same as 1911	F.& P.	1,200	85	1,020	1,462	80	1,170	1,200	85	1,020
General repairs, 1901												
Tool house—frame,shingle roof, 1881—new shingles 1903—11'x16'x7'—176 sq. ft. @ 90c	Same	Same	F.& P.	158	60	95	158	60	95	158	60	95
Toilet, 1881, B. & B. roof—4'x4'x6'	2 toilets @ $30	Same	F.& P.	30	50	15	60	60	36	30	50	15
Wood shed, 1900—12'x16'x7'	Same	Same	F.& P.	50	80	40	50	80	40	50	80	40
Toilet frame, shingle roof, 1902—5'x8'x7'	Included above	Same		30	80	24				30	80	24
WETMORE:												
Tool house, 1892—shingle roof—14'x20'x8'—280 sq. ft. @ 90c	Same	Same	F.& P.	252	60	151	252	60	151	252	60	151
Toilet, 1900, B. & B. roof—4'x5'x6'	Same	Same	F.& P.	30	75	22	30	75	22	30	75	22
Stock chute	Same	Same	F.	25	50	12	25	50	12	25	50	12
MUDDSON JUNCTION:												
Toilet, 1900—4'x6'—$30.00—half interest	Same	Same	F.& P.	15	100	15	15	90	14	15	95	14
RIDGE:												
Section house—concrete blocks, Carey roof, 1907—24'x32'x16'—768 sq. ft. @ $3.00	Same	Same	F.& P.	2,304	90	2,074	2,304	90	2,074	2,304	90	2,074
Tool house—frame, shingle roof, 1900—12'x14x'7½'—168 sq. ft. @ 90c	Same	Same	F.& P.	151	80	121	151	80	121	151	80	121
Toilet, 1900—moved from Hallston—6'x8'x9'	Same	Same	F.& P.	50	75	38	50	75	38	50	75	38

THIS PAGE B
VERTICAL IN

Barn, 1900—8'x11'x4½', 9'x11'x7'—187 sq. ft. @ 90c	Same	Same	F.& P.	168	80	134	168	80	134	168	80	134
Spring house—old timber—iron—16'x16'x6½'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Hog barn—1901—11'x15'x8'	Same	Same	F.& P.	20	75	15	20	75	15	20	75	15
AU TRAIN:												
Tool house, 1881—13'x13'x6'—169 sq. ft. @ 90c	Same	Same	F.& P.	152	50	76	152	50	76	152	50	76
Toilet, 1900, B. & B.—4'x4'x6'	Same	Same	F.& P.	30	75	22	30	75	22	30	75	22
		Section house—private residence purchased—1912	F.& P.							500	75	375
ONOTA												
Tool house, frame, B. & B. roof, 1881—12'x14'x7'—168 sq. ft. @ 90c	Same	Same	F.& P.	151	50	76	151	50	76	151	50	76
Coal house—frame, B. & B. roof, 1881—6'x12'x5'—72 sq. ft. @ 50c		Same	F.& P.	36	50	18	36	50	18	36	50	18
SAND RIVER:												
Section house, 1887—new roof 1907—9'x23'x6', 24'x 25'x16'—807 sq. ft. @ $2.00	Same	Same	F.& P.	1,614	75	1,210	1,614	75	1,210	1,614	75	1210
Lamp house, 1892—frame, new shingle roof, 1901—6'x8'x7'—48 sq. ft. @ $1.50	Same	Same	F.& P.	72	75	54	72	75	54	72	75	54
Agent's house, 1881—frame, new shingle roof, 1901—15'x25'x12'—375 sq. ft. @ $2.00	Warehouse — same description—375 sq. ft. @ $1.00	Same as 1911	F.& P.	750	70	525	375	70	262	750	50	375
Tool house, 1887, B. & B.—12'x15'x6'—180 sq. ft. @ 90c	Same	Same	F.& P.	162	50	81	162	50	81	162	50	80
Toilet, 1887, B. & B.—4'x4'x6'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Omitted	Omitted	½ box car	F.& P.							70	80	56
Omitted	Omitted	One box car	F.& P.							133	80	106
GORDON:												
Section house—18'x24'x14'—addition 1906—14'x16'x 8½'—moved from Deerton, 1893—originally built, 1881—new siding in 1902—rebuilt in 1906—656 sq. ft. @ $2.00	Same	Same	F.& P.	1,312	90	1,181	1,312	80	1,050	1,312	90	1,181
Well—30' deep in 1911	Same	Same	F.& P.	75	100	75	75	100	75	75	100	75
Tool house, 1893—frame, shingle roof—10'x12'x8'—120 sq. ft. @ 90c	Same	Same	F.& P.	108	75	81	108	75	81	108	75	81
Toilet—4'x4'x6'	Same	Same	F.& P.	30	60	18	30	60	18	30	60	18
CHOCOLAY:												
Section house reported in 1902 was burned in 1906—not rebuilt	Section house—2 old box cars	Omitted					250	50	125			

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
Tool house, 1881, B. & B. roof—10'x10'x7'—100 sq. ft. @ 90c	Same	Same	F.& P.	90	50	45	90	50	45	90	50	45
Toilet—frame, B. & B., 1881—4'x4'x8'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
		Total								37,406		26,950
		Allocated 1913										
		Freight and Passenger								35,034		25,136
		Freight								2,372		1,814
Total Sault Ste. Marie to Marquette				39,140		28,977	38,925		28,362	37,406		26,950
ST. IGNACE TO SOO JUNCTION												
St. Ignace:												
Section tool house, 1887—frame, B. & B. roof—6'x16'x 7'—96 sq. ft. @ 90c	Same	Same	F.& P.	86	50	43	86	50	43	86	50	43
Tool house—frame and shingle roof, 1888—9'x16'x7'—144 sq. ft. @ 90c	Tool house—frame, shingle roof, 1888—6'x16'x7'—96 sq. ft. @ 90c	Same as 1911	F.& P.	130	50	65	86	50	43	130	50	65
Track scales—Fairbanks'—36 ft. @ $35.00	Same	Same	F.	1,260	80	1,008	1,260	70	882	1,260	80	1,008
Toilet—5'x5'x6'—frame with B. & B. roof—1900	Same	Same	F.& P.	30	75	22	30	75	22	30	75	22
Flag house—frame, 1881—8'x8'x7'—64 sq. ft. @ $2.00	Same except built 1900	Same as 1911	F.& P.	128	50	64	128	80	102	128	50	64
Oil house—1899—frame, shingle roof—6'x8'x7'—48 sq. ft. @ $1.50	Same	Same	F.& P.	72	75	54	72	75	54	72	75	54
Switchman's house—frame, shingle roof, 1888—6'x8'x7' 48 sq. ft. @ $2.00	Same	Same	F.& P.	96	65	62	96	65	62	96	65	67
Car foreman's house—frame, shingle roof, 1888—7'x 9'x7'—63 sq. ft. @ $1.25	Same	Same	F.	79	60	47	79	60	47	79	60	47
Coal house, B. & B.—6'x10'x7'—60 sq. ft. @ 90c	Same	Same	F.& P.	54	50	27	54	80	43	54	50	27
Ice house and buffet, car office, 1896—frame, shingle roof—18½'x70'—1,295 sq. ft. @ $1.00	Same	Same	F.& P.	1,295	95	1,230	1,295	80	1,036	1,295	95	1,230
Gravel elevator—1901	Same	Same	F.& P.	1,024	50	512	1,024	60	614	1,024	50	512
Omitted	Omitted	House—4'x8'—for track scales	F.							48	80	38

THIS PAGE BO
VERTICAL IN

ALLENVILLE:												
Section house—18'x24'x16'—annex 10'x18'x6½—612 sq. ft. @ $2.00—overhauled 1902	Same	Same	F.& P.	1,224	80	979	1,224	70	857	1,224	80	979
Tool house—B. & B.—12'x12'x7'—144 sq. ft. @ 90c	Same	Same	F.& P.	130	70	91	130	70	91	130	70	91
Well—4'x4'x18'	Same	Same	F.& P.	73	100	73	73	100	73	73	100	73
Barn—1902—B. & B.—12'x21½x9'—258 sq. ft. @ 90c	Same	Same		232	80	186	232	80	186	232	80	186
MORAN:												
Section house—frame, shingle roof—1902—18'x24'x16' kitchen 7½'x10'x7'—507 sq. ft. @ $2.00	Same	Same	F.& P.	1,014	90	913	1,014	70	710	1,014	90	913
Cellar under house, add to house	Same	Same	F.& P.	50	100	50	50	100	50	50	100	50
Well—4'x4'x25' deep	Same	Same	F.& P.	101	100	101	101	90	91	101	100	101
Coal house—7'x9'x5'—63 sq. ft. @ 50c	Same	Same	F.& P.	32	80	26	32	50	16	32	80	26
Toilet—4'x4'x6'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Tool house—1902—log ,shingle roof—13'x14'x6½'—182 sq. ft. @ 90c	Same	Same	F.& P.	164	80	131	164	80	131	164	80	131
KENNETH:												
Section house, frame, shingle roof—18'x24'x16'—kitchen 10'x22x8'—652 sq. ft. @ $2.00	Same	Same	F.& P.	1,304	90	1,174	1,304	90	1,174	1,304	90	1,174
Storehouse, 1902—logs and B. & B. roof—9'x12'x5'—108 sq. ft. @ 90c	Same	Same	F.& P.	97	85	82	97	85	82	97	85	82
Toilet—4'x5'x7'	Same	Same	F.& P.	30	70	21	30	70	21	30	70	21
Tool house—B. & B. all over—9'x13'—117 sq. ft. @ 90c	Same	Same	F.& P.	105	70	74	105	70	74	105	70	74
TROUT LAKE:												
Tool house—frame, shingle roof—10'x12'x8'—120 sq. ft. @ 90c	Same	Same	F.& P.	108	50	54	108	50	54	108	50	54
Tool house—log, shingle roof, 1881—11½'x13'x6'—150 sq. ft. @ 50c	Same except 1887—10'x12'—120 sq. ft. @ 50c	Same as 1911	F.& P.	75	50	38	60	50	30	75	50	38
Toilet, 1887—5'x8'x8'	Same	Same	F.& P.	50	50	25	50	50	25	50	50	25
Oil house, 1906—8'x16'x7' (½ box car)	Same	Same	F.& P.	67	50	34	67	50	34	67	50	34
FIBORN JUNCTION:												
Omitted	Omitted	3 box cars @ $133	F.& P.							399	60	239
Omitted	Omitted	Section tool house—10'x14'x6'—140 sq ft. @ 90c	F.& P.							126	60	76

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
HENDRIE:												
Section house—frame, shingle roof—18'x24'x14½', 14'x14'x12', 10'x16'x6'—788 sq. ft. @ $2.00	Same		F.& P.	1,576	50	788	1,576	50	788	1,576	50	788
Tool house, 1881—10½'x10'x6½'—168 sq. ft. @ 90c	Same		F.& P.	151	50	76	151	50	76	151	50	76
Toilet—6'x6'x7'	Same		F.& P.	50	50	25	50	50	25	50	50	25
		Total								11,490		8,443
		Allocated 1913										
		Freight and Passenger								10.103		7,350
		Freight								1,387		1,093
Total St. Ignace to Soo Junction				10,917		8,090	10,858		7,551	11,490		8,443
Total Sault Ste. Marie to Marquette				39,140		28,977	38,925		28,362	37,406		26,950
Total East of Marquette				50,057		37,067	49,783		35,913	48,896		35,393
MARQUETTE TO NESTORIA												
MARQUETTE:												
Toilet, 1881—frame, shingle roof—10'x10'x7½'	Same	Can't identify		70	50	35	100	50	50			
Sand house, 1881—shingle roof—18'x24'x9'—432 sq. ft. @ $1.00	Lower yard—same description	Included in Eng. House Schedule		432	50	216	350	40	140			
Flag house—Jackson St., 1881—tin roof—6'x9'x7'—54 @ $2.00	15 flag and switch houses (1872) (1881) @ $1.20	Same as 1911	F.& P.	108	50	54	1,800	50	900	108	50	54
Flag house, 1881—6'x9'x7'—54 sq. ft. @ $2.00	Included above	Can't identify		108	50	54						
Tool house, 1881—11'x12'x7'—132 sq. ft. @ 90c	3 tool houses 10'x18', 10'x14', 8½'x8½'—392 sq. ft. @ 90c	Same	F.& P.	119	50	60	353	50	176	119	50	60
Flag house, 1881—8'x8'x6½'—64 sq. ft. @ $2.00	Included above	Can't identify		128	50	64						
Superintendent of motive power office, brick, 1881	Same—2 story—24'x64'	Included in Shops, Engine House Schedule		4,047	55	2,226	4,000	50	2,000			

THIS PAGE BO
VERTICAL IN

Toilet, 1881—6'x8'x6'	4 toilets (1881) @ $30	Can't identify		50	50	25	120	50	60			
Ice house, 1881	Omitted	Same—at Jackson St.	F.& P.	600	50	300				600	50	300
Flag house—Lake St.—1900	Included above	Can't identify		128	85	109						
Stock chute—1900	Stock chute—16'x5½' sides 5' high—1900	Omitted		25	85	21	20	80	16			
Switch house, 1881—4'x6'x6'—24 sq. ft. @ $2.00	Can't identify	Can't identify		48	50	24						
Storehouse—stone, 1881—20'x84'x27'—2,436 sq. ft. @ $2.50	Same	Same—corner Lake and Baraga Ave.	F.& P.	6,090	50	3,045	6,090	60	3,654	6,090	50	3,045
Ore dock office—stone, iron roof, 1872—31'x40'x16'—1,240 sq. ft. @ $2.00	Same, 30'x36'x20'—1½ st'y	Same—old M. H. & O. general office building	O.	2,480	50	1,240	2,160	70	1,512	2,480	50	1,240
Coal dock office—stone, iron roof, 1872—21'x26'x12'—546 sq. ft. @ $2.00	Cant' identify	Moved away		1,092	50	546						
Coal dock tool house—shingle roof—12'x18'x7½'—216 — sq. ft. @ 90c	Coal dock office—12'x10'x 7½'—1872	Same as 1911 except called Coal Dock office—Pickands dock	F.	194	50	97	120	60	72	194	50	97
Bulkhead tool house—iron roof—8'x20'x7'—160 sq. ft. @ 90c	Coal dock	Can't identify		144	50	72						
Flag house—Front St.—1887	Included above	Same—9'x9'—81 sq. ft. @ $2.00	F.& P.	128	60	77				162	60	97
Flag house, 1872—shingle roof—6'x8'x7'—48 sq. ft. @ $2.00	Included above	Same—on Spring St.	F.& P.	96	50	48				96	50	48
Flag house—3rd St.—8'x10'x7'—80 sq. ft. @ $2.00	Included above	Can't identify		160	50	80						
Flag house, 1881—N. Third St.—8'x10'x7'—80 sq. ft. @ $2.00	Included above	Can't identify		160	50	80						
Watch house	Included above	Can't identify		96	50	48						
Flag house—4th St.	Included above	Flag house 4th St.—old yard master's office	F.& P.	96	50	48				500	75	375
Flag House—5th St.	Included above	Same	F.& P.	96	50	48				96	50	48
Tool house, 1872—180 sq. ft. @ 90c	Included above	Same	F.& P.	162	50	81				162	50	81
Toilet—1881—18'x20'—360 sq. ft.	Same—stone, round house lean to	Transferred to Shops Engine House Schedule		360	50	180	360	50	180			
Stable—1872	Same—16'x30'	Transferred to Shop Eng. House Schedule		300	50	150	300	50	150			
Oil cellar—earth roof	Removed	Removed		60	75	45						
Store house and office, 1872—iron roof and sides—dimensions not given	Omitted	Same—dimensions 20'x40'	F.& P.	1,500	50	750				1,500	50	750
Scrap house	Old car body near 3d St.	Box and bodies, 3 old	F.& P.	100	50	50	100	40	40	150	50	75
Sand house—1900	Upper yard—18'x24'x20'—432 sq. ft. @ $1.00	Included in Shops Engine House Schedule		410	80	328	432	80	346			
Track scales—40 ft.—I beam on dead rails—Fairbanks' 1907—actual cost	Omitted	Same—in lower Mackinaw yard	F.	1,600	95	1,520				1,600	95	1,520
Scale house—8'x8'x7'—64 sq. ft. @ $1.50	4-8½'x4½' @ 90c	Same—lower Mackinaw yard	F.	96	75	72	360	70	252	96	75	72
Scales—Fairbanks—7'x24'	None there	None there		860	75	645						
Scales—Fairbanks—7'x34'—1887	Omitted	Same except 38 ft.—at Lake St.	F.	1,190	75	893				1,190	75	893

Riggs—1911—Exhibit 1	Hansel—1911—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
Scale house—8'x8'x7'	Included above	Same except 4'x8'x7'—32 sq. ft. @ $1.50										
Switch house—1872—west of coal shed	Can't identify	at Lake St.	F.	96	75	72				48	90	43
Cement block factory	Same, 16'x20'x12, frame and shed	Can't identify		96	50	48						
Scale house	Included above	Same	F.& P.	875	90	788	1,000	80	800	875	90	788
		Same—4'x8'x7'—32 sq. ft. @ $1.50—Lake St.	F.	96	95	91				48	90	43
Scale house	2—10'x14' @ $2.00	Over automatic scales—9'x12'—108 sq. ft. @ $1.00	O.	96	95	91	400	70	280	108	75	81
Scale house	Included above	Ore yard over east scales—14'x16'—224 sq. ft. @ $1.00	O.	96	85	82				224	75	168
Scales—1907—7'x36'—Fairbanks	Omitted	Same—West End Ore Yard—East Scales	O.	1,260	95	1,197				1,260	95	1,197
Scales—1907—7'x24'—Fairbanks	Omitted	Same except 27'—self-registering (West End Ore Yard—West Scales)	O.	840	95	798				840	95	798
Scales—1890—7'x28'—Standard	Omitted	Same except 1889 at Lake St.	F.	980	85	833				980	85	833
Switch house—shingle—8½'x8½'x8'—72 sq. ft. @ $2	Can't identify	Same—at fly switch	O.	144	75	108				144	75	108
Toilet—4'x4'x6'	Included above	Can't identify		30	50	15						
Barn	Omitted	Same—18'x24'—frame	F.& P.	150	50	75				150	50	75
Toilet—1881	Included above	Can't identify		30	50	15						
3 iron houses—various sizes	Same except iron sides and roof—30'x168'— (1872) lean to 22'x68'—frame	Included in Shops Eng. House Schedule		150	50	75						
Company's store house—upper yard—frame—30'x165'—4,950 sq. ft. @ $1.00		Same as 1911	F.& P.	4,950	85	4,208	3,600	60	2,160	4,950	85	4,208
Dwelling—Genesee St.—18'x16'x7', 12'x16'x8', 18'x24'x14'—912 sq. ft. @ $2.00	Omitted	Same—not used	F.& P.	1,824	50	912				1,824	50	912
Dwelling—Division St.—14'x16'x7', 22'x38'x13'—1,060 sq. ft. @ $2.00	Omitted	Same	F.& P.	2,120	50	1,060				2,120	50	1,060
Dwelling—Division St.—18'x23'x14'—414 sq. ft. @ $2	Omitted	Same	F.& P.	828	50	414				828	50	414
Dwelling—Hampton St.—10'x12'x7', 18'x28'x14'—624 sq. ft. @ $2.00	Omitted	Same	F.& P.	1,248	50	624				1,248	50	624
Dwelling—Woods St.—16'x26'x9'—416 sq. ft. @ $2.00	Omitted	Same except on Furnace St.	F.& P.	832	50	416				832	50	416
Fences, sidewalks, sheds, etc.	Same	Included in Station Building Schedule		200	50	100	800	60	480			

Toilet—4'x4'x6'	Included above	Same	O.	30	50	15				30	50	15
Flag house—Hampton—1897—5'x7'x6'—35 sq. ft.	Included above	Same—35 sq. ft. @ $2.00	F.& P.	70	80	56				70	80	56
Omitted	Ice house 28'x61'x23'—(1881)—rebuilt 1900	Ice house at Lake St.—30'x60'x20'—1,800 sq. ft.					1,700	75	1,275	2,000	70	1,400
Omitted	Omitted	Weight master's office—west end ore yard—14'x16'—224 sq. ft. @ $1.00	O.							224	75	168
Omitted	Omitted	Switch shanty at fly switch	O.							96	50	48
Omitted	Store house—lower yard—old brick round house											
Omitted	Stationery store house—5th St.—12'x42'—frame	Included in Shop Eng. House Schedule					3,000	40	1,200			
		Omitted					500	60	300			
Can't identify	Included above	Flag house—corner Lake and Mesnard St. 9'x9'x7'—81 sq. ft. @ $2.00	F.& P.							162	50	81
Cant identify	Included above	Flag house—Genessee St.—9'x9'x7'—81 sq. ft. @ $2.00	F.& P.							162	50	81
Can't identify	Included above	Flag house—Lake St., near old frt house—6'x6'x7'—36 sq. ft. @ $2.00	F.& P.							72	85	61
Can't identify	Included above	Flag house—West end lower yard—4'x5'—20 sq. ft. @ $2.00	F.& P.							40	50	20
Can't identify	Included above	Flag house—corner 3rd and Maple St.—6'x8'x7'—48 sq. ft. @ 2.00								96	50	48
Can't identify	Can't identify	Target between 3rd and 4th Sts.—12'x14'	F.& P.							96	50	48
BAGDAD:												
Toilet—4'x4'x6'—moved to side track	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
GRAND VIEW:												
Tool house—1896—rebuilt, 10½'x12½'x7'—131 sq. ft. @ 90c	Same	Same	F.& P.	118	80	94	118	80	94	118	80	94
EAGLE MILLS:												
Telegraph office, 1892—8'x8'x7½'—1905, 7'x8'x7'—120 sq. ft. @ $2.00	Same	Telegrgph office—1905—7'x8'x7'—56 sq. ft. @ $2.00	F.& P.	240	85	204	240	85	204	112	85	95
Tool house, 1881—10'x18'x7'—180 sq. ft. @ 90c—moved from Bagdad	Same	Same	F.& P.	162	50	81	162	50	81	162	50	81
Tool house	Same	Removed		162	50	81	162	50	81			
SOUTH EAGLE MILLS:												
Section tool house, 1881—shingle roof—12'x16'x8'—192 sq. ft. @ 90c	Same	Same	F.& P.	173	50	87	173	50	87	173	50	87

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
NEGAUNEE:												
Tool and coal house, 1899—shingle roof, cost $109.62—12'x24'x8'—288 sq. ft. @ 90c	Same	Same	F.& P.	259	76	194	259	75	194	259	75	194
Flag house—6'x6'x7'—1905—shingle roof	Same	Same—Pioneer Ave.	F.& P.	72	90	65	72	90	65	72	90	65
Flag house—7'x8'x8'	Same	Same—Gold St.	F.& P.	112	60	67	112	60	67	112	60	67
Flag house—8'x8'x7'—1881—iron roof	Same	Same—Silver St.—64 sq. ft. @ $2.00	F.& P.	128	50	64	128	50	64	128	50	64
Omitted	Omitted	Section house—½ box car—8'x16'	F.& P.							125	75	94
NEGAUNEE JUNCTION:												
Signal house—8'x8'x8'—iron roof	Omitted	Same except at Negaunee	F.& P.	128	50	64	128	50	64	128	50	64
PALMER:												
Section house, 1872—14'x20'x9', 20'x26'x16'—general repairs, 1904—800 sq. ft. @ $2.00	Same	Same	Ore	1,600	85	1,360	1,600	80	1,280	1,600	85	1,360
Well	Same	Same	Ore	50	90	45	50	90	45	50	90	45
Tool house—R. R. R., 1907—10'x12'x7', 10'x20'x7'—320 sq. ft. @ 90c	Same	Same	Ore	288	95	274	228	95	217	288	95	274
Toilet—5'x6'x7'—shingle roof, 1872	Same	Same	Ore	30	50	15	30	50	15	30	50	15
NORTH ISHPEMING:												
Section house—14'x20'x8', 14'x22'x14'—588 sq. ft. @ $2.00—general repairs, 1902	Same except 12'x20'x8 instead of 14'x20'x8'—548 sq. ft. @ $2.00	Same as 1911	F.& P.	1,176	75	882	1,096	70	767	1,176	75	882
Freight train shed—11'x288'—3,168 sq. ft. @ $1.00—$3,168—½ interest	Same except $2,500—½ interest	Transferred to Station Building Schedule		1,584	75	1,188	1,250	70	875			
Freight train check house, 1896—10'x11'x10'—110 sq. ft. @ $1.25	Same	Transferred to Station Building Schedule		138	75	104	138	75	104			
Track scales—Fairbanks—7'x36'—pile foundation @ $35.00	Same	Same	F.	1,260	70	882	1,260	70	882	1,260	70	882
Flag house, 1889—shingle roof—8'x8'x7'—64 sq. ft. @ $2.00	Same	Same	F.& P.	128	50	64	128	50	64	128	50	64
Car smith house, 1889—B. & B. shingle—10'x18'x7', 7'x9'x6'—243 sq. ft. @ $1.00	Same	Transferred to Shops Eng. House Sched.		243	60	146	243	60	146			

THIS PAGE B

Barn, 1881—frame, shingle roof—14′x20′x12, 16′x24′x 12′—664 sq. ft. @ 90c	Same	Same	F.& P.	598	50	299	598	50	299	598	50	299
Toilet—4′x5′x6′	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Tool house, 1881—12′x16½′x7½′—198 sq. ft. @ 90c	Same	Same	F.& P.	178	50	89	178	50	89	178	50	89
SOUTH ISHPEMING:												
Section house, 1881—14′x13′x8′, 16′x24′x16′—566 sq. ft. @ $2.00	Same	Sold		1,132	50	566	1,132	50	566			
Telegraph office, 1881—26′x13′x13′—338 sq. ft. @ $1.25	Same	Transferred to Station Building Schedule		422	50	211	422	50	211			
Toilet—4′x5′x7′—built 1881	Same	Removed		30	50	15	30	50	15			
Tool house—10′x8′x7′—80 sq. ft. @ 90c	Same	Same	Ore	72	50	36	72	50	36	72	50	36
Roadmaster's dwelling—frame, shingle roof—13′x16′x9′ 13′x24′x16′—520 sq. ft. @ $2.00	Same except called yard-master's house	Same except called round house, foreman's dwelling	Ore	1,040	70	728	1,040	70	728	1,040	70	728
Sand house, 1881—frame, shingle roof—16′x23′x14′—368 sq. ft. @ $1.00	Same	Transferred to Shops, Eng. Houses Sched.		368	50	184	368	50	184			
Toilet	Same	Same	Ore	30	50	15	30	50	15	30	50	15
Toilet	Same	Same	Ore	30	50	15	30	50	15	30	50	15
WINTHROP:												
Section house, 1887—20′x14′x9′, 20′x21′x14′, 20′x11′x7′—920 sq. ft. @ $2.00	Same except built 1881	Sold		1,840	60	1,104	1,840	60	1,104			
Register house—frame, shingle—5′x10′x7′—50 sq. ft. with fixtures @ $2	Same—1887	Same as 1911	F.& P.	100	70	70	100	70	70	100	70	70
Tool house, 1887—10′x20′x8′—200 sq. ft. @ 90c	Same	Razed		180	50	90	180	50	90			
Toilet, 1902—4′x5′x7′	Same	Same	F.& P.	30	80	24	30	80	24	30	80	24
STONEVILLE:												
Section house—frame, shingle roof, 1872—9′x11′x9′, 13′x11′x8′, 16½′x24½′x16′—646 sq. ft. @ $2.00	Same	Same	F.& P.	1,292	50	646	1,292	50	646	1,292	75	969
Tool house, 1872—12′x14′x8′—168 sq. ft. @ 90c	Same	Same	F.& P.	151	50	76	151	50	76	151	50	76
Toilet—4′x6′x7′	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Well	Same	Same	F.& P.	75	90	68	75	90	68	75	90	68
GREENWOOD:												
Section house ,1872—frame, shingle roof—11½′x22′x9′, 22′x28′x7′, 16′x21′x7′—1,205 sq. ft. @ $2.00	Same	Same	F.& P.	2,410	50	1,205	2,410	50	1,205	2,410	50	1,205
Well—3′x3′x25′ @ 25.2c per cu. ft.	Same	Same	F.& P.	57	90	51	57	90	51	57	90	51
Tool house, 1872—11′x18½′x8′—203 sq. ft. @ 90c	Same	Same	F.& P.	183	50	92	183	50	92	183	50	92
Toilet—4′x6′x7′	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
REPUBLIC:												
Coal house—5½'x12½'—old timber	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Tool house—12'x14'x8'—168 sq. ft. @ 90c	Same	Same	F.& P.	151	50	76	151	50	76	151	50	76
Standard stock chute—4'x16'	Same	Same	F.	25	80	20	25	80	20	25	80	20
Stock yard	Same	Same	F.	25	80	20	25	80	20	25	80	20
Section car house, 1900—8'x8'x7'—64 sq. ft. @ 90c	Same	Same	F.& P.	58	85	49	58	85	49	58	85	49
Section house—18'x29'—1½ story—addition 13'x24'—1 story, 1900—834 sq. ft. @ $2.00	Same	Same	F.& P.	1,668	85	1,418	1,668	85	1,418	1,668	85	1,418
HUMBOLDT:												
Section house, 1908—shingle roof—18½'x24'x17'—444 sq. ft. @ $2.00	Same	Same	F.& P.	888	90	799	888	90	799	888	90	799
Well	Same	Same	F.& P.	50	100	50	50	100	50	50	100	50
Sand house, 1885—shingle roof—16'x20'x11'—320 sq. ft.	Same	Transferred to Shops Eng. House Sched.		320	55	176	320	55	176			
Tool house, 1885—new roof, 1900—12'x14'x7'—168 sq. ft. @ 90c	Same	Same	F.& P.	151	80	121	151	80	121	151	80	121
Cinder pit, brick, 1872—4'x18'x3½' @ $5.00 per lin. ft.	Same	Abandoned		90	50	45	90	50	45			
Coal house—frame, shingle roof, 1887—8'x15'x7½'—120 sq. ft. @ 50c	Same	Same	F.& P.	60	50	30	60	50	30	60	50	30
Toilet, 1887—5½'x9'x7½'	Same	Same	F.& P.	50	50	25	50	50	25	50	50	25
Section tool house, 1880—frame, shingle roof—10'x18'7"—180 sq. ft. @ 90c	Same	Same	F.& P.	162	50	81	162	50	81	162	50	81
CHAMPION:												
Tool house, 1865—B. & B. roof—10'x18'x7'—180 sq. ft. @ 90c	Same	Same	F.& P.	162	50	81	162	60	97	162	50	81
Toilet—9'x9'x8'—1887—painted 1906	Same	Same	F.& P.	50	50	25	50	50	25	50	50	25
Coal bin, 1887—8'x28'x8'—224 sq. ft. @ 50c	Same	Same	F.& P.	112	50	56	112	50	56	112	50	56
Express office, 1887—frame, shingle roof—14'x20'x11'—280 sq. ft. @ $2.00	Same	Transferred to Station Building Schedule.		560	50	280	560	50	280			

MICHIGAMME:											
Tool house, shingle, 1872—10'x18'x8'—180 sq. ft. @ 90c	Same	Same	F.& P.	162	50	81	162	50	81	162	50	81
Car smith house—frame, B. & B. roof—8'x8'x8' (1902) 64 sq. ft. @ $1.00	Same	Transferred to Shops, Engine Houses, etc.		64	85	54	64	85	54			
Toilet, 1872—4'x6½'x7'	Same	Same	F.& P.	30	90	27	30	90	27	30	90	27
Agent's dwelling, 1872—new sills and roof 1901—8'x 12'x8', 20'x24'x11', 16'x26'x16'—992 sq. ft. @ $2.00	Same	Same	F.& P.	1,984	80	1,587	1,984	80	1,587	1,984	80	1,587
Toilet—shingle roof—4'x4½'x6½'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Toilet—shingle roof—4'x5'x7'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Coal shed—12'x14'x7'—B. & B.	Same	Same	F.& P.	84	50	42	84	50	42	84	50	42
Stock chute	Same	Same	F.	25	50	12	25	50	12	25	50	12
SPURR:												
Tool house, 1872—14'x14'x6'—196 sq. ft. @ 90c	Same except 10'x14'x6'—140 sq. ft. @ 90c	Same as 1911	F.& P.	176	50	88	126	50	63	176	50	88
Well	Same	Same	F.& P.	50	90	45	50	90	45	50	90	45
Root cellar—8'x11½'x6'	Abandoned	Abandoned		25	50	12						
THREE LAKES:												
Section house, 1880—shingle roof—general repairs 1905 12'x12'x7', 20'x26'x16'—664 sq. ft. @ $2.00	Same	Same	F.& P.	1,328	75	996	1,328	75	996	1,328	75	996
Well with pump—2'x3½'x10'.	Same	Same	F.& P.	25	90	22	25	90	22	25	90	22
Tool house—11'x14'x4' B. & B.—11'x14'x7' shingle—308 sq. ft. @ 90c	Same	Same	F.& P.	277	50	139	277	50	139	277	50	139
Toilet—4'x5'x7'—frame, shingle, 1880	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Lamp house, 1880—6½'x8½'x9'—55 sq. ft. @ $1.50	Same	Same	F.& P.	82	50	41	82	50	41	82	50	41
NESTORIA:												
Section house, 1872—frame, shingle roof—general repairs 1904—14'x20'x9', 20'x26'x16'—800 sq. ft. @ $2	Same	Same	F.& P.	1,600	85	1,360	1,600	75	1,200	1,600	85	1,360
Well—spring—curbing	Same	Same	F.& P.	15	75	11	15	75	11	15	75	11
Lunch room—frame, comp. roof, open glass sides—built 1900—12'x24'x9'—288 sq. ft. @ $2.00	Moved to Herman	Moved to Herman—Station Building Schedule		576	70	403						
Tool house, 1872—12'x14'x8'—168 sq. ft. @ 90c	Same	3 tool houses—1872—12'x14'x8'—168 sq. ft. @ 90c—$151—3x$151	F.& P.	151	50	76	151	50	76	453	50	227
Coal house for depot—8½'x12½'x7½'	Same	Burned		53	50	26	53	50	26			
Toilet, 1872—5'x6'x7'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Toilet, 1872—5'x9'x8'	Same	Same	F.& P.	50	50	25	50	50	25	50	50	25
Barn—12'x21'x19'—252 sq. ft. @ 90c	Same	Same	F.& P.	227	80	182	227	80	182	227	80	182

Riggs—1911—Exhibit 1	Hansel—1911—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911			1912			1913		
				C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				$		$	$		$	$		$
Dwelling—2 story—cost $1,475.54, 1906—26'x24'—624 sq. ft. @ $2.50	Same except called agent's dwelling	Same as 1912	F.& P.	1,560	90	1,404	1,560	90	1,404	1,560	90	1,404
Agent's dwelling—8'x11'x16' and 15'x28'x6'—508 sq. ft. @ $2.00	Omitted	Same as 1911	F.& P.	1,016	85	864				1,016	85	864
Toilet—B. & B.—4'x4'x6'	Same	Same	F.& P.	30	70	21	30	70	21	30	70	21
Scales, 1907—Fairbanks—36' long @ $35	Same	Same	F.	1,260	95	1,197	1,260	95	1,197	1,260	95	1,197
None there	Scale house, 1898—4½'x9'	None there					50	70	35			
Omitted		Iron house—B. & B. Dept.—12'x12'x8'—144 sq. ft. @ 50c								72	50	36
Omitted	Omitted	2 car bodies	F.& P.							266	50	133
	Omitted	Stock pen and loading chute	F.							75	50	38
		Total								61,566		42,277
		Allocated 1913										
		Freight and Passenger								46,194		30,296
		Freight								6,826		5,670
		Ore								8,546		6,311
Total Marquette to Nestoria				74,345		49,171	59,545		37,812	61,566		42,277
NESTORIA TO HOUGHTON												
SUMMIT:												
Section house, 1883—frame, shingle roof—general repairs 1904—8'x14'x6½', 12'x14'x8' and 16'x26'x16'—696 sq. ft. @ $2.00	Same	Same	F.& P.	1,392	50	696	1,392	50	696	1,392	50	696
Tool house, 1883—10'x20'x8'—200 sq. ft. @ 90c	Same	Same	F.& P.	180	50	90	180	50	90	180	50	90
Toilet—3'x4'x6'—B. & B., 1883	Same	Same	F.& P.	30	50	15	30	50	15	30	15	15
Barn, 1902—logs, B. & B. roof—12'x12'x6'—144 sq. ft. @ 50c	Omitted	Same	F.& P.	72	90	65				72	90	65
HERMAN:												
Tool house, 168 sq. ft. @ 90c	Same	Same	F.& P.	151	50	76	151	50	76	151	50	76
Purchased 1913	Purchased 1913	Section house	F.& P.							1,900	100	1,900

TAYLOR:												
Section house, 1872—frame, shingle roof—general repairs 1904—8'x10'x7' and 20'x26'x16'—600 sq. ft. @ $2.00	Same	Same	F.& P.	1,200	80	960	1,200	75	900	1,200	80	960
Well	Same	Same	F.& P.	50	90	45	50	90	45	50	90	45
Tool house, 1872—frame, shingle—10'x16'x7'—160 sq. ft. @ 90c	Same	Same	F.& P.	144	50	72	144	50	72	144	50	72
Toilet—3'x4'x7'—shingle roof	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
L'ANSE												
Section house, 1876—2 story—rebuilt 1904—20'x26' and 12'x26'—712 sq. ft. @ $2.00	Same, except built 1872—12'x12' instead of 12'x26'—664 sq. ft. @ $2.00	Same as 1911	F.& P.	1,424	90	1,282	1,328	75	996	1,424	90	1,282
Standard stock chute	Same	Same	F.	25	50	12	25	50	12	25	50	12
Stock yards	Same	Same	F?	25	50	12	25	50	12	25	50	12
Tool house, 1906—10'x14'x6'—140 sq. ft. @ 90c	Same	Same	F.& P.	126	90	113	126	90	113	126	90	113
Old hotel—roof and paint, 1902—36'x50'—1,800 sq.ft.	Omitted	Same	F.& P.	5,000	50	2,500				5,000	50	2,500
Dwelling—1½ story—24'x24'—576 sq. ft. @ $2.00	Omitted	Same	F.& P.	1,152	50	576				1,152	50	576
BARAGA:												
Section house—shingle roof—general repairs 1904—12'x14'x8' and 16'x26'x16'—584 sq. ft. @ $2.00	Same	Same	F.& P.	1,168	85	993	1,168	80	934	1,168	85	993
Well	Same	Same	F.& P.	50	90	45	50	90	45	50	90	45
Tool house, 1883—10'x20'x8'—200 sq. ft. @ 90c	Same	Same	F.& P.	180	50	90	180	50	90	180	50	90
Toilet—4'x5'x7'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
IRON BRIDGE:												
Section house—frame, shingle roof—general repairs 1904—12'x14'x10' and 16'x26'x16'—584 sq. ft. @ $2	Same	Same	F.& P.	1,168	80	934	1,168	80	934	1,168	80	934
Well	Same	Same	F.& P.	50	90	45	50	90	45	50	90	45
Tool house—shingle roof—10'x20'x8'—200 sq. ft. @ 90c	Same	Same	F.& P.	180	50	90	180	50	90	180	50	90
Toilet—4'x4½'x6'	Same	Same	F.& P.	30	70	21	30	70	21	30	70	21
Ice house, 1900—12'x14'x10—168 sq. ft. @ $1.00	Omitted	Same	F.& P.	168	85	143				168	85	143
KEWEENAW BAY:												
Toilet—shingle roof—3½'x7'x7'—$30—½ interest	Same	Same	F.& P.	15	50	8	15	50	8	15	50	8
Car smith house—iron roof, 1901—8'x8'x8'—64 sq. ft. @ $1.00	Same	Transferred to Shops Engine Houses, etc.		64	85	54	64	85	54			
Car smith shop, 1901	Same—old car body	Transferred to Shops, Eng. Houses, etc.		64	85	54	64	85	54			
Tool house, 1906—shingle roof—10'x12'x8'—120 sq. ft. @ 90c	Same	Same		108	95	103	108	90	97	108	95	103

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
NEWTON:												
Section house, 1883—new roof 1900—general repairs 1904—9'x12'x6', 12'x14'x12', 16'x26'x16'—692 sq. ft. @ $2.00	Same	Same	F.& P.	1,384	85	1,176	1,384	80	1,107	1,384	85	1,176
Well	Same	Same	F.& P.	75	90	68	75	90	68	75	90	68
Tool house—11'x20'x8'—220 sq. ft. @ 90c	Same	Same	F.& P.	198	50	99	198	50	99	198	50	99
Toilet—4'x4'x6'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
STURGEON:												
	Called Sturgeon River											
	Section house, 1883—general repairs 1904—16'x 26'x12', 12'x14'x8', 8'x14' x6½'—696 sq. ft. @ $2.	Same as 1912	F.& P.				1,392	80	1,114	1,392	80	1,114
Omitted	Tool house, 1883—10'x20'x 8'	Same as 1912	F.& P.				180	60	108	180	60	108
Omitted	Toilet, 1883—3'x4'x6'	Same as 1912	F.& P.				30	50	15	30	50	15
Omitted	Omitted	Well	F.& P.							75	90	68
CHASSELL:												
Toilet, 1893—shingle roof—4'x8'x7'	Same	Same	F.& P.	30	60	18	30	60	18	30	60	18
Tool house, 1883—new roof 1907—10'x20'x8'—200 sq. ft.— @ 90c	Same	Same	F.& P.	180	75	135	180	75	135	180	75	135
HOUGHTON:												
Sand house, 1883—shingle roof—16'x20'x10'—320 sq. ft. @ $1.00	Same	Transferred to Shops, Eng. House Sched.		320	50	160	320	50	160			
Tool house, 1906—12'x17'x8'—294 sq. ft. @ 90c	Same	Same	F.& P.	184	90	166	184	90	166	184	90	166
Car smith house, 1890	Same	Transferred to Shops Eng. Sched.		64	60	38	64	60	38			
Ice house, 1883—shingle roof—15'x65'x12'—975 sq. ft. @ $1.00	Same	Same	F.& P.	975	50	488	975	50	488	975	50	488
Car smith shops	Omitted	Transferred to Shops Eng. Sched.		64	60	38						
Scales—standard, 1900, stone foundation, 36 ft. @ $35	Same	Same	F.	1,260	80	1,008	1,260	80	1,008	1,260	80	1,008
Scale house, 1900—4'x8½'x6½'—34 sq. ft. @ $1.50	Same	Same	F.	51	80	41	51	80	41	51	80	41

THIS PAGE R

Oil house, 1900—shingle—8'x8'x7' and 8'x9'x5'—136 sq. ft. @ $1.50	Same	Transferred to Shops Eng. Houses., etc., Schedule		204	80	163	204	80	163		
Coal house, 1900—B. & B.—7'x18½'x6'—129 sq. ft. @ 50c	Same	Same	F.& P.	65	80	52	65	80	52	65	80	52
Toilet, 1883—shingle roof—4'x7'x6'	Same	Same	F.& P.	50	50	25	50	50	25	50	50	25
Boarding house, 1883—general repairs 1904—20'x26'x 16', 25'x33'x21'—1,345 sq. ft. @ $2.00	Omitted	Same	F.& P.	2,690	80	2,152				2,690	80	2,152
Toilet, 1900—4'x6'x6'	3 toilets, 1900—4'x6'x6' @ $30	Same	F.& P.	30	75	22	90	70	63	30	75	22
Toilet, 1900—4'x6'x6'	Included above	Same	F.& P.	30	75	22				30	75	22
Stocks yards, 1883—18'x80'	Same except 25'x82'	Same as 1911	F.	43	50	22	40	50	20	43	50	22
Stock chute	Same	Same as 1911	F.	25	50	12	25	50	12	25	50	12
Coal house, 1883—8'x8'x4' and 12'x16'x8'—256 sq. ft. @ 50c	Same	Same	F.& P.	128	50	64	128	50	64	128	50	64
Well house—4'x4'x5'	Same	Same	F.& P.	16	50	8	16	50	8	16	60	8
Toilet, 1900	Included above	Same	F.& P.	30	75	22				30	75	22
Two wells	Same	Same	F.& P.	100	90	90	100	90	90	100	90	90
Barn	Same	Same		100	50	50	100	50	50	100	50	50
		Total								25,399		16,869
		Allocated 1913										
		Freight and Passenger								23,970		16,869
		Freight								1,429		1,107
Total Nestoria to Houghton				22,602		15,278	14,959		10,556	25,399		17,976
Total Marquette to Nestoria				74,345		49,171	59,545		37,812	61,566		42,277
Total Marquette to Houghton				96,947		64,449	74,504		48,368	86,965		60,253
NESTORIA TO STATE LINE												
VERMILAC:												
Section house—frame, shingle roof, 1887—11'x24'x9' and 18'x24'x16'—696 sq. ft. @ $2.00	Same	Same	F.& P.	1,392	60	835	1,392	75	1,044	1,392	60	835
Tool house, 1887—12'x20'x7'—240 sq. ft. @ 90c	Same	Same	F.& P.	216	50	108	216	50	108	216	50	108
Toilet—4'x4'x7'—B. & B., 1887	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
COVINGTON:												
Section house, 1895—frame, shingle roof—12'x12'x6', 12'x25'x9'—444 sq. ft. @ $2.00	Same	Same	F.& P.	888	75	666	888	75	666	888	75	666
Well	Same	Abandoned	F.& P.	50	100	50	50	100	50			
Tool house, 1906—10'x12'x8'—120 sq. ft. @ 90c	Same	Same	F.& P.	108	90	97	108	90	97	108	90	97
Office building	Omitted	Same	F.& P.	80	75	60				80	75	60

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911			1912			1913		
				C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
				$		$	$		$	$		$
PEACH:												
Section house—frame, shingle roof, 1887—11'x24'x9' and 18'x24'x16'—696 sq. ft. @ $2.00	Same—general repairs 1902	Same as 1911	F.& P.	1,392	50	696	1,392	75	1,044	1,392	50	696
Tool house, 1895—10'x11'x6'—110 sq. ft. @ 90c	Same	Same	F.& P.	99	75	74	99	75	74	99	75	74
Toilet—4'x4'x6'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Ice house, 1901—logs, B. & B. roof—10'x12'x8'—120 sq. ft. @ $1.00	Omitted	Same as 1911	F.& P.	120	90	108				120	90	108
SIDNAW:												
Coal house—shingle roof—10'x12'x10'—120 sq. ft. @ 50c	Same—built 1897	Same	F.& P.	60	60	36	60	70	42	60	60	36
Tool house, 1897—B. & B.—11½'x11'x6'—126 sq. ft. @ 90c	Same		F.& P.	113	75	85	113	75	85	113	75	85
Repair house (old cars)—8'x30'x7' and 8'x30'x7'	Same	Transferred to Shops Eng. Houses Sched.		266	50	133	200	50	100			
Tool house, 1902—shingle roof—12½'x15'x6½'—188 sq. ft. @ 90c	Same	Same	F.& P.	169	85	144	169	85	144	169	85	144
Stock chute—portable	Same	Same	F.	25	75	19	25	75	19	25	75	19
		Car bodies—2 @ $50								100	50	50
KITCHI:												
Section house, 1887—shingle roof—general repairs 1902—11'x24'x9' and 18'x24'x16'—696 sq. ft. @ $2.00	Same	Same	F.& P.	1,392	75	1,044	1,392	75	1,044	1,392	75	1,044
Water from trains	Same											
Tool house, 1895—logs, B. & B.—12'x15'x6'—180 sq. ft. @ 90c	Same	Same	F.& P.	162	70	113	162	70	113	162	70	113
Toilet	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
KENTON:												
Coal house, 1898—shingle roof—8'x10'x7'—80 sq. ft. @ 50c	Same	Same	F.& P.	40	80	32	40	80	32	40	80	32
Tool house, 1892—10'x16'x7'—160 sq. ft. @ 90c	Same	Same	F.& P.	144	65	94	144	65	94	144	65	94
Purchased since 1912	Purchased since 1912	Section house	F.& P.							300	100	300
Omitted	Omitted	Stock chute, portable	F.							25	75	19
TROUT CREEK:												
Section house—shingle roof—rebuilt 1911—11'x24'x9' and 18'x24'x16'—696 sq. ft. @ $2.00	Same	Same	F.& P.	1,392	100	1,392	1,392	90	1,253	1,392	95	1,322

THIS PAGE BO

Tool house, 1902—10'x14'x6'—140 sq. ft. @ 90c	Same	Same	F.& P.	126	85	107	126	85	107	126	85	107
Toilet, 1887—4'x6'x6'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Stock chute—portable	Same	Same	F.	25	75	19	25	75	19	25	75	19
BRUCE'S CROSSING:												
Tool house, 1901—10'x16'x6'—160 sq. ft. @ 90c	Same	Same	F.& P.	144	85	122	144	85	122	144	85	122
ST. COLLINS:												
Tool house, 1901	Same	Same	F.& P.	144	85	122	144	85	122	144	85	122
EWEN:												
Tool house, 1891—shingle roof—8'x8'x6', 10'x12'x7½' —184 sq. ft. @ 90c	—		F.& P.	166	60	100	166	60	100	166	60	100
New stock yard amd chute, 1905	Same	Same	F.	25	90	22	25	90	22	25	90	22
Stock yard	Same	Same	F.	100	90	90	100	90	90	100	90	90
Well dug 1909—actual cost	Same	Same	F.& P.	250	100	250	250	100	250	250	100	250
MATCHWOOD:												
Section house—built 1911—concrete block, Carey roof 20'x24'x16' and 16'x16'x18'—736 sq. ft. @ $3.00	Same	Same	F.& P.	2,208	100	2,208	2,000	100	2,000	2,208	95	1,098
Wood house, 1911	Same	Same	F.& P.	50	100	50	50	100	50	50	95	48
Stock chute and stock yard, 1906	Same	Same	F.	150	90	135	150	90	135	150	90	135
Tool house, 1910—7'x8'x6' and 10'x12'x6'—176 sq. ft @ 90c	Same	Same	F.& P.	158	100	158	158	100	158	158	95	150
GROESBECK:												
Section house—built 1887—general repair 1905—11'x 24'x9' and 18'x24'x16'—696 sq. ft. @ $2.00	Same	Same	F.& P.	1,392	80	1,114	1,392	80	1,114	1,392	80	1,114
Water supply from trains			F.& P.	108	50	54	108	50	54	108	50	54
Tool house—built 1887—10'x12'x7'—120 sq. ft. @ 90c	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Toilet, 1887—4'x4'x6'	Same	Same										
TOPAZ:												
Stock yard—20'x80'	Same	Same	F.	48	80	38	48	80	38	48	80	38
Stock chute	Same	Same	F.	25	80	20	25	80	20	25	80	20
BERGLAND:												
Toilet—shingle roof—4'x5'x7'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Tool house—120 sq. ft. @ 90c	Same	Same	F.& P.	108	50	54	108	50	54	108	50	54

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	Allocation	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$	$		$	$		$
LAKE GOGEBIC:												
Section house—shingle roof—repairs 1901—11'x24'x9' and 18'x24'x16'—696 sq. ft. @ $2.00	Same	Same	F.& P.	1,392	80	1,114	1,392	75	1,044	1,392	80	1,114
Tool house—B. & B. (½ old car)—8'x16'x7'	Same	Same	F.& P.	67	50	34	67	50	34	67	50	34
Toilet, 1898—4'x4'x6'	Same		F.& P.	30	70	21	30	70	21	30	70	21
TULA:												
Section house—built 1911—concrete block—24'x32'x 17'—768 sq. ft. @ $3.00	Same	Same	F.& P.	2,304	100	2,304	2,000	100	2,000	2,304	95	2,189
Well—3'x3'x14' @ 25.2c per cu. ft.	Same	Same	F.& P.	32	100	32	32	100	32	32	100	32
Tool house, 1887—10'x12'x6'—120 sq. ft. @ 90c	Same		F.& P.	108	50	54	108	50	54	108	50	54
Toilet—3'x4'x6'	Same		F.& P.	30	50	15	30	50	15	30	50	15
Ice house—logs—13'x13'x5'—169 sq. ft. @ $1.00	Omitted		F.& P.	169	50	84				169	50	84
THOMASTON:												
4 double cottages @ $2,500	Same—built 1887	Same	F.& P.	10,000	85	8,500	10,000	80	8,000	10,000	85	8,500
Addition to No. 1—1910	Same	Same	F.& P.	1,200	100	1,200	1,200	100	1,200	1,200	95	1,140
Addition to No. 2—1910	Same	Same	F.& P.	1,100	100	1,100	1,100	100	1,100	1,100	95	1,045
Sand house—built 1906—12'x40'—8 ft. high—480 ft. @ $1.00	Same	Transferred to Shops Eng, House Sched.		480	90	432	480	90	432			
Oil house—8'x8'x7'—64 sq. ft. @ $2.00	Same	Transferred to Shops Eng. House Sched.		128	80	102	128	80	102			
Warehouse—20'x70'—1,400 sq. ft. @ $1.00	Same	None there		1,400	75	1,050	1,400	75	1,050			
Store house—18'x30'—540 sq. ft. @ $1.00	Same	None there		540	75	405	540	75	405			
Freight house—25'x85'—2,125 sq. ft. @ $1.00	Same	Burned, for new freight house see Station Building Schedule		2,125	70	1,488	2,125	70	1,488			
Toilet—4'x6'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
4 toilets—6'x12' @ $50.00	Same—built 1888	Same	F.& P.	200	50	100	200	50	100	200	50	100
Omitted	7 small buildings—oil, lamp, bicycle houses, etc. — 700 sq. ft. @ $1.00	Omitted					700	60	420			
ABITOSSE:												
Section house—concrete block—24'x32'x17—768 sq. ft. @ $3.00	Same	Same	F.& P.	2,304	100	2,304	2,000	100	2,000	2,304	95	2,189
Tool house, 1887—logs and shake roof—10½'x13'x5½' 137 sq. ft. @ 50c	Same	Same	F.& P.	68	50	34	68	50	34	68	50	34
Toilet—3'x3'x6'	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15

THIS PAGE BOU
VERTICAL IN B

BESSEMER:												
Toilet—4'x4'x7'—1896—B. & B.	Same		F.& P.	30	60	18	30	60	18	30	60	18
MONTREAL:												
Section house—built 1887—general repairs 1905—11'x24'x9' and 18'x24'x16'—696 sq. ft. @ $2.00	Same	Same	F.& P.	1,392	80	1,114	1,392	80	1,114	1,392	80	1,114
Tool house—built 1887—B. & B.—11'x20'x7'—220 sq. ft. @ 90c	Same	Same	F.& P.	198	50	99	198	50	99	198	50	99
Tool house—logs, B. & B.—12'x13'x6½'—156 sq. ft. @ 50c	Same	Same	F.& P.	78	50	39	78	50	39	78	50	39
Toilet	Same	Same	F.& P.	30	50	15	30	50	15	30	50	15
Ice house—built 1902—logs, B. & B. roof—9'x11'x8'—99 sq. ft. @ $1.00	Same	Same	F.& P.	99	90	89	99	90	89	99	90	89
		Total								34,515		27,490
		Allocated 1913										
		Freight and Passenger								34,092		27,128
		Freight								423		362
Total Nestoria to State Line				39,079		32,316	38,528		31,489	34,515		27,490

RECAPITULATION — MISCELLANEOUS STRUCTURES

DIVISION	1911		1912		1913	
	C. R.	P. V.	C.R.	P. V.	C. R.	P. V.
	$	$	$	$	$	$
Saulte Ste. Marie to Marquette	39,140	28,977	38,925	28,362	37,406	26,950
St. Ignace to Soo Junction	10,917	8,090	10,858	7,551	11,490	8,443
Marquette to Nestoria	74,345	49,171	59,545	37,812	61,566	42,277
Nestoria to Houghton	22,602	15,278	14,959	10,556	25,399	17,976
Nestoria to State Line	39,079	32,316	38,528	31,489	34,515	27,490
Miscllaneous items at various points			15,000	10,500		
Total in Michigan	186,083	133,832	177,815	126,270	170,376	123,136

COPY BOUND CLOSE IN CENTER

Schedule No. 30
LOCOMOTIVES

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS

Description			Riggs—1911—Exhibit 1			Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A		
Number	Year Built	Weight Tons	C. R.	%	P. V.	C. R.	%	P. V.	C. R.	%	P. V.
			$		$	$		$	$		$
12	1883	30	5,520	50	3,060	5,450	50	2,725	5,520	50	3,060
13	1882	25	4,650	50	2,575	4,730	50	2,365	Sold		
14	1883	27	4,968	50	2,754	5,050	50	2,525	4,968	50	2,759
37	1881	33	6,072	50	3,366				Scrapped		
38	1881	33	6,072	50	3,366				Scrapped		
39	1881	33	6,072	50	3,366				Scrapped		
40	1882	38	6,916	50	3,838	6,780	55	3,729	6,916	50	3,835
41	1882	38	6,916	50	3,838	6,780	55	3,729	6,916	50	3,835
42	1882	38	6,916	50	3,838	6,780	55	3,729	6,916	50	3,835
43	1882	38	6,916	50	3,838	6,780	55	3,729	6,916	50	3,835
44	1882	38	6,916	50	3,838	6,820	55	3,751	6,916	50	3,835
45	1882	38	6,916	50	3,838				Sold		
46	1882	38	6,916	50	3,838	6,820	55	3,751	6,916	50	3,835
50	1872	35	6,370	50	3,535	6,180	55	3,399	6,370	50	3,535
51	1872	35	6,370	50	3,635	6,180	55	3,399	Scrapped	1913	
60	1883	37	6,734	50	3,737	6,700	60	4,020	6,734	50	3,737
61	1883	37	6,734	50	3,737	6,700	60	4,020	6,734	50	3,737
70	1884	34	6,188	50	3,434	6,250	50	3,125	6,188	50	3,439
72	1884	34	6,188	50	3,434	6,250	50	3,125	6,168	50	3,429
73	1882	39	7,020	50	3,900	6,990	50	3,495	7,020	50	3,900
74	1882	39	7,020	50	3,900	6,990	50	3,495	7,020	50	3,900
80	1872	37	6,734	50	3,737	6,830	50	3,415	6,734	50	3,741
81	1870	35	6,370	50	3,535	6,490	50	3,245	Scrapped	1913	
82	1873	39	7,020	50	3,900	7,150	50	3,575	7,020	50	3,901
100	1888	47	8,366	50	4,653	8,300	45	3,735	8,366	50	4,658
101	1888	47	8,366	50	4,653	8,300	55	4,565	8,366	50	4,658
102	1888	47	8,366	70	6,138	8,520	55	4,686	8,366	55	5,029
103	1888	47	8,366	50	4,653	8,520	65	5,538	8,366	50	4,658
104	1888	47	8,366	50	4,653	8,520	70	5,964	8,366	50	4,658
105	1888	47	8,366	50	4,653	8,520	60	5,112	8,366	50	4,658

106	1888	47	8,366	50	4,653	8,520	70	59.64	8,366	50	4,658
107	1888	47	8,366	50	4,653	8,520	70	5,964	8,366	50	4,658
108	1888	47	8,366	50	4,653	8,450	55	4,647	8,366	50	4,658
109	1888	47	8,366	60	5,396	8,520	60	5,112	8,366	58	5,251
110	1888	47	8,366	60	5,396	8,840	60	5,304	8,366	58	5,251
111	1888	47	8,366	60	5,396	8,840	55	4,862	8,366	58	5,251
112	1888	47	8,366	50	4,653	8,840	65	5,746	8,366	60	5,400
113	1888	47	8,366	50	4,653	8,520	70	5,964	8,366	60	5,400
114	1888	47	8,366	70	6,138	8,520	70	5,964	8,366	66	5,844
203	1884	44	7,920	50	4,400	7,880	50	3,940	7,920	50	4,395
204	1884	44	7,920	50	4,400	7,880	55	4,334	7,920	50	4,395
205	1884	44	7,920	50	4,400	7,880	55	4,334	7,920	50	4,395
206	1884	44	7,920	50	4,400	7,880	55	4,334	7,920	50	4,395
208	1883	42	7,560	50	4,200	7,640	55	4,202	7,560	50	4,200
209	1883	42	7,560	50	4,200	7,640	60	4,584	7,560	50	4,200
211	1882	41	7,380	50	4,100	7,475	55	4,111	7,380	50	4,100
300	1887	50	8,900	70	6,530	9,040	60	5,424	8,900	60	5,740
301	1887	50	8,900	70	6,530	9,040	75	6,780	8,900	70	6,530
302	1887	50	8,900	70	6,530	9,040	65	5,876	8,900	70	6,530
303	1887	50	8,900	50	4,950	9,040	60	5,424	8,900	50	4,950
304	1887	50	8,900	70	6,530	9,040	70	6,328	8,900	65	6,135
305	1887	50	8,900	50	4,950	9,040	60	5,424	8,900	50	4,950
306	1887	50	8,900	70	6,530	9,040	75	6,780	8,900	65	6,135
307	1887	50	8,900	60	5,740	9,040	65	5,876	8,900	60	5,740
308	1887	50	8,900	60	5,740	9,040	60	5,424	8,900	60	5,740
309	1887	50	8,900	60	5,740	9,040	60	5,424	8,900	60	5,740
310	1887	50	8,900	50	4,950	8,975	65	5,834	8,900	60	5,740
311	1887	50	8,900	50	4,950	8,975	60	5,385	8,900	50	4,950
400	1888	48	8,544	50	4,752	8,650	70	6,055	8,544	50	4,755
401	1888	48	8,544	50	4,752	8,650	75	6,487	8,544	70	6,271
403	1888	48	8,544	70	6,269	8,650	70	6,055	8,544	65	5,892
404	1888	48	8,544	50	4,752	8,650	75	6,487	8,544	50	4,755
405	1888	48	8,544	50	4,752	8,650	65	5,622	8,544	50	4,755
406	1888	48	8,544	60	5,510	8,650	75	6,487	8,544	55	5,134
407	1888	48	8,544	60	5,510	8,650	65	5,622	8,544	60	5,513
408	1888	48	8,544	50	4,752	8,650	70	6,055	8,544	50	4,755
410	1888	48	8,544	60	5,510	8,650	65	5,622	8,544	55	5,134
411	1888	48	8,544	60	5,510	8,650	80	6,920	8,544	55	5,134
412	1888	48	8,544	60	5,510	8,650	65	5,622	8,544	55	5,134
413	1888	48	8,544	50	4,752	8,650	70	6,055	8,544	50	4,755
414	1888	48	8,544	70	6,269	8,650	70	6,055	8,544	65	5,892
415	1894	54	9,504	70	6,977	8,650	75	6,487	9,504	65	6,554

Description			Riggs—1911—Exhibit 1			Hansel—1912—Exhibit 15			Riggs—1913—Exhibit 1-A		
Number	Year Built	Weight Tons	C. R.	%	P. V.	C. R.	%	P. V.	C. R.	%	P. V.
			$		$	$		$	$		$
90	1907	85	14,110	84	12,124	14,980	80	11,984	14,110	78	11,380
600	1907	86	14,276	84	12,267	15,830	85	13,455	14,276	78	11,514
601	1907	86	14,276	84	12,267	15,830	85	13,455	14,276	78	11,514
602	1907	86	14,276	84	12,267	15,830	80	12,664	14,276	78	11,514
603	1907	86	14,276	84	12,267	15,830	80	12,664	14,276	78	11,514
604	1907	86	14,276	84	12,267	15,830	80	12,664	14,276	78	11,514
605	1907	86	14,276	84	12,267	15,830	78	12,347	14,276	78	11,514
606	1907	86	14,276	96	13,774	16,150	80	12,920	14,276	88	12,770
607	1907	86	14,276	96	13,774	16,150	75	12,112	14,276	88	12,770
500	1907	74	12,580	84	10,804	13,850	80	11,080	12,580	78	10,138
501	1907	74	12,580	84	10,804	13,850	80	11,080	12,580	78	10,138
502	1907	74	12,580	84	10,804	13,850	85	11,772	12,580	78	10,138
503	1909	74	12,580	92	11,692	13,850	85	11,772	12,580	84	10,804
550	1912	94				16,750	100	16,750	17,163	96	16,550
551	1912	94				16,750	100	16,750	17,163	96	16,550
552	1913	96							19,225	100	19,225
553	1913	96							19,225	100	19,225
554	1913	96							19,225	100	19,225
700	1913	93							18,264	100	18,264
701	1913	93							18,264	100	18,264
702	1913	93							18,264	100	18,264
703	1913	93							18,264	100	18,264
704	1913	93							18,264	100	18,264
705	1913	93							18,264	100	18,264
706	1913	93							18,264	100	18,264
707	1913	93							18,264	100	18,264
708	1913	93							18,264	100	18,264
709	1913	93							18,264	100	18,264
710	1913	93							18,264	100	18,264
711	1913	93							18,264	100	18,264
Total (Michigan and Wisconsin)			740,198		493,456	771,835		526,391	1,008,825		767,396

	Number of Locomotives used in Interstate Service			Value of Locomotives used in Interstate Service						Percentage of Value Apportioned to Wisconsin			Value Apportioned to Wisconsin					
				1911		1912		1913					1911		1912		1913	
	1911	1912	1913	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.	1911	1912	1913						
				$	$	$	$	$	$				$	$	$	$	$	$
Freight Locomotives used jointly in Michigan and Wisconsin			9					77,964	48,782			88.0					68,608	42,928
Passenger Locomotives used jointly in Michigan and Wisconsin			4					37,678	25,520			86.7					32,667	22,126
Total Locomotives used jointly in Michigan and Wisconsin	10	12	13	87,082	58,053	107,150	73,383	115,642	74,302	86.39	* 81.2	* 87.35	75,230	50,152	* 87,013	* 59,539	101,275	65,054

	1911		1912		1913	
	C. R.	P. V.	C. R.	P. V.	C. R.	P. V.
	$	$	$	$	$	$
Total value of all locomotives owned by D., S. S. & A. R'y	740,198	493,456	771,835	526,391	1,008,825	767,396
Deduct value apportioned to Wisconsin	75,230	50,152	87,013	59,539	101,275	65,054
Total Value of Locomotives Apportioned to Michigan	664,968	443,304	684,822	466,852	907,550	702,342

* Computed from original appraisals.

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS

Schedule No. 31
PASSENGER TRAIN CARS

Name or No.	Class	Lgth.	Wheels		Weight	Lights	Seats		Heating	Vest'bd	Built	Riggs—1911 Exhibit 1			Hansel—1912 Exhibit 15			Riggs—1913 Exhibit 1-A		
		Feet	No.	Diam. Inches			No.	Kind				C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
												$		$	$		$	$		$
1	B. M. & E.	44	4	33	45,000	Oil			Steam	No	1888	2,700	100	2,700	3,500	45	1,575	3,600	50	1,800
2	B. M. & E.	44	4	33	45,000	Oil			Steam	No	1888	2,700	91	2,457	3,500	55	1,925	3,600	50	1,800
3	B. M. & E.	44	4	33	45,000	Oil			Steam	No	1888	2,700	50	1,350	3,500	65	2,275	3,500	50	1,750
10	Bag. & Ex.	50	4	33	54,000	Oil			Steam	No	1888	3,240	50	1,620	3,700	60	2,200	3,500	50	1,750
11	Bag. & Ex.	50	4	33	54,000	Oil			Steam	No	1888	3,240	50	1,620	3,700	60	2,220	3,500	50	1,750
12	Bag. & Ex.	50	4	33	54,000	Pintsch			Steam	No	1888	3,240	50	1,620	3,700	60	2,220	3,500	50	1,750
13	Bag. & Ex.	50	4	33	54,000	Oil			Steam	No	1888	3,240	50	1,620	3,700	60	2,220	3,500	50	1,750
14	Bag. & Ex.	50	4	33	54,000	Oil			Steam	No	1888	3,240	50	1,620	3,700	60	2,220	3,500	50	1,750
15	Bag. & Ex.	50	4	33	54,000	Oil			Steam	No	1888	3,240	50	1,620	3,700	60	2,220	3,500	50	1,750
40	B. M. & E.	39	4	33	41,000	Oil			Steam	No	1888	2,500	94	2,350	3,100	45	1,395	3,200	50	1,600
42	B. M. & E.	39	4	33	41,000	Oil			Steam	No	1888	2,500	97	2,425	3,100	55	1,705	3,200	50	1,600
43	B. & M.	39	4	33	41,000	Oil			Steam	No	1888	2,500	50	1,250	2,800	50	1,400	3,200	50	1,600
51	S. C. Ch.	49	4	33	48,000	Oil	26	L. B.	Steam	Yes	1884	4,320	50	2,160	4,500	60	2,700	4,600	50	2,300
54	S. C. Ch.	45	4	33	48,000	Oil	26	L. B.	Steam	No	1884	4,320	50	2,160	4,200	55	2,310	4,320	50	2,160
55	S. C. Ch.	45	4	33	48,000	Oil	26	L. B.	Steam	No	1884	4,320	50	2,160	4,200	60	2,520	4,320	50	2,160
56	S. C. Ch	49	4	33	48,000	Pintsch	26	L. B.	Steam	No	1883	4,320	50	2,160				4,600	50	2,300
57	S. C. Ch.	49	4	33	48,000	Oil	26	L. B.	Steam	Yes	1884	4,320	50	2,160	4,500	60	2,700	4,600	50	2,300
58	S. C. Ch.	49	4	33	48,000	Oil	27	L. B.	Steam	No	1884	4,320	50	2,160	4,500	60	2,700	4,600	50	2,300
59	S. C. Ch.	48	4	33	48,000	Oil	26	L. B.	Hot Water	No	1884	4,320	50	2,160	4,500	60	2,700	4,600	50	2,300
60	B. M. & E.	51	4	33	*77,500	Pintsch			Steam	Skel. Yes	1911				6,610	90	5,949	6,611	94	6,214
71	Comb.	50	4	33	47,000	Oil	13	L. B.	Steam	No	1883	3,760	50	1,880	4,300	50	2,150	4,200	50	2,100
72	Comb.	48	4	33	47,000	Oil	13	L. B.	Steam	No	1883	3,760	50	1,880	4,200	50	2,100	4,200	50	2,100
73	Comb.	48	4	33	47,000	Oil	13	L. B.	Hot Water	No	1883	3,760	50	1,880	4,200	50	2,100	4,200	50	2,100
74	Comb.	48	4	33	47,000	Pintsch	13	L. B.	Hot Water	No	1883	3,760	50	1,880	4,200	50	2,100	4,200	50	2,100
75	Comb.	51	4	33	56,000	Pintsch	13	H.& K.	Steam	No	1883	3,760	50	1,880	4,350	50	2,175	4,450	50	2,225
100	B. M. & E.	65	6	33	84,000	Pintsch			Steam	No	1905	5,000	85	4,250	4,750	70	3,800	5,000	78	3,900
101	B. M. & E.	65	6	33	84,000	Pintsch			Steam	No	1905	5,000	85	4,250	4,750	85	4,037	5,000	78	3,900
211	F. C. Ch.	50	4	33	64,000	Oil	30	H. & K.	Steam	Yes	1888	5,760	50	2,880	5,800	50	2,900	5,760	50	2,880
212	F. C. Ch.	50	4	33	64,000	Pintsch	30	H. & K.	Steam	Yes	1888	5,760	50	2,880	5,800	50	2,900	5,760	50	2,880
213	F. C. Ch.	50	4	33	56,000	Pintsch	30	H. & K.	Steam	No	1888	5,760	50	2,880	5,800	50	2,900	5,760	50	2,880
214	F. C. Ch.	50	4	33	56,000	Pintsch	30	H. & K.	Steam	No	1888	5,760	50	2,880	5,800	50	2,900	5,760	50	2,880
215	F. C. Ch.	50	4	33	56,000	Pintsch	30	H. & K.	Steam	No	1888	5,760	50	2,880	5,800	60	3,480	5,760	50	2,880

216	F. C. Ch.	50	4	33	56,000	Pintsch	30	H. & K.	Steam	No	1888	5,760	50	2,880	5,800	50	2,900	5,760	50	2,880
221	F. C. Ch.	50	4	33	56,000	Oil	28	H. & K.	Steam	No	1888	5,760	50	2,880	5,800	60	3,480	5,760	50	2,880
222	F. C. Ch.	50	4	33	56,000	Pintsch	28	H. & K.	Hot Water	No	1888	5,760	50	2,880	5,800	65	3,770	5,760	50	2,880
223	F. C. Ch.	50	4	33	56,000	Oil	28	H. & K.	Steam	No	1888	5,760	50	2,880	5,800	50	2,900	5,760	50	2,880
224	F. C. Ch.	50	4	33	56,000	Oil	28	H. & K.	Steam	No	1888	5,760	50	2,880	5,800	60	3,480	5,760	50	2,880
225	F. C. Ch.	50	4	33	56,000	Oil	28	H. & K.	Steam	No	1888	5,760	50	2,880	5,800	50	2,900	5,760	50	2,880
226	F. C. Ch.	50	4	33	56,000	Pintsch	28	H. & K.	Steam	No	1888	5,760	50	2,880	5,800	50	2,900	5,760	50	2,880
227	F. C. Ch.	50	4	33	56,000	Oil	28	H. & K.	Steam	No	1888	5,760	50	2,880	5,800	50	2,900	5,760	50	2,880
228	F. C. Ch.	50	4	33	56,000	Oil	28	H. & K.	Hot Water	No	1888	5,760	50	2,880	5,800	50	2,900	5,760	50	2,880
229	F. C. Ch.	50	4	33	56,000	Oil	28	H. & K.	Hot Water	No	1888	5,760	50	2,880	5,800	50	2,900	5,760	50	2,880
300	Diner	50	4	33	54,000	Elec. & Oil	3S &	3L. Tabl.	Hot Water	Yes	1888	5,400	50	2,700	6,000	50	3,000	5,400	50	2,700
301	Diner	50	4	33	64,000	Elec. & Oil	4	tables	Hot water	Yes	1888	5,400	50	2,700	6,000	50	3,000	5,400	50	2,700
302	Private G. S.					Elec. & Oil			Hot Water	Yes	1912	5,400	50	2,700	6,000	50	3,000	2,000	97	1,940
303	Diner	50	4	33	68,400	Elec. & Pintsch	3S.	tables	Steam	Yes	1888	5,400	50	2,700	6,000	50	3,000	5,400	50	2,700
304	Buffet	50	4	33	58,900		4 L.	tables.	Steam	Yes	1888	5,400	50	2,700	6,000	50	3,000			
305	Diner	66			128,900	Elec. & Pintsch			Hot Water	Yes	1912				15,995	95	15,195	16,000	97	15,520
306	Obs. & Cafe	72			130,600	Elec. & Pintsch			Hot Water	Yes	1912				17,040	95	16,188	17,040	97	16,529
307	Diner	66	4	33	130,200	Elec. & Pintsch			Hot Water	Yes	1912				15,995	95	15,195	16,000	97	15,520
308	Obs. & Cafe	72			130,200	Elec. & Pintsch			Hot Water	Yes	1912				17,040	95	16,188	17,040	97	16,529
500	B. & E.	52			62,000	Elec. & Pintsch			Steam	No	1902	3,720	76	2,827	3,200	70	2,240	3,720	72	2,678
501	B. & E.	52			62,000	Elec. & Pintsch			Steam	No	1902	3,720	76	2,827	3,200	70	2,240	3,720	72	2,678
502	B. & E.	52			69,000	Elec. & Pintsch			Steam	No	1908	4,140	91	3,767	4,200	85	3,570	4,140	85	3,519
555	Private G. M.		6			Elec. & Pintsch			Hot Water	No	1888	12,000	80	9,600	9,500	85	8,075	12,000	50	6,000
600	S. C. Ch.	51			71,000	Elec. & Pintsch			Steam	Yes	1902	6,390	76	4,856	6,200	70	4,340	6,390	72	4,601
601	S. C. Ch.	51			71,000	Elec. & Pintsch			Steam	Yes	1902	6,390	76	4,856	6,200	70	4,340	6,390	72	4,601
602	S. C. Ch.	66			91,000	Elec. & Pintsch			Steam	Yes	1908	8,190	91	7,453	8,000	85	6,800	8,000	85	6,800
603	S. C. Ch.	66			91,000	Elec. & Pintsch			Steam	Yes	1908	8,190	91	7,453	8,000	85	6,800	8,000	85	6,800
604	S. C. Ch.	66			91,000	Elec. & Pintsch			Steam	Yes	1908	8,190	91	7,453	8,000	85	6,800	8,000	85	6,800
700	F. C. Ch.	51			71,000	Elec. & Pintsch			Steam	Yes	1907	6,390	76	4,856	6,700	80	5,360	6,650	72	4,788
701	F. C. Ch.	51			71,000	Elec. & Pinstch			Steam	Yes	1902	6,390	76	4,856	6,700	75	5,025	6,650	72	4,788
702	F. C. Ch.	51			76,000	Elec. & Pintsch			Steam	Yes	1908	6,840	91	6,224	7,000	80	5,600	7,300	85	6,205
(Calumet)	Diner									Yes					7,500	40	3,000			
S. S. Marie	Sleeper	65	6		109,400	Elec. & Pintsch			Hot Water	Yes	1902	15,200	76	11,552	15,200	60	9,120	15,200	72	10,944
Houghton	Sleeper	65	6		109,400	Elec. & Pintsch			Hot Water	Yes	1902	15,200	76	11,552	15,200	60	9,120	15,200	72	10,944
Duluth	Sleeper	65	6		109,400	Elec. & Pintsch			Hot Water	Yes	1902	15,200	76	11,552	15,200	60	9,120	15,200	72	10,944
Ishpeming	Sleeper	65	6		109,400	Elec. & Pintsch			Hot Water	Yes	1902	15,200	76	11,552	15,200	60	9,120	15,200	72	10,944
Nuperior	Sleeper	65	6		109,400	Elec. & Pintsch			Hot Water	Yes	1902	15,200	76	11,552	15,200	60	9,120	15,200	72	10,944
Newberry	Sleeper	77.5	6		123,900	Elec. & Pintsch			Hot Water	Yes	1906	16,500	86	14,190	16,400	80	13,120	16,500	80	13,200
Negaunee	Sleeper	77.5	6		123,900	Elec. & Pintsch			Hot Water	Yes	1906	16,500	86	14,190	16,400	80	13,120	16,500	80	13,200
Total included in Recapitulation...												397,030		265,140	481,730		323,542	471,441		319,825

* Steel.

EQUIPMENT USED JOINTLY IN WISCONSIN AND MICHIGAN

			1911		1912						1913		Assigned to Wisconsin					
			Michigan and Wisconsin		Michigan and Wisconsin		Assigned to Michigan		Assigned to Wisconsin		Michigan and Wisconsin		1911		1912		1913	
Train No.	Car No	Class	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
			$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
	500	Baggage	3,720	2,827							3,720	2,678						
	501	Baggage			3,200	2,240	2,336	1,695	864	605								
	502	Baggage	4,140	3,767	4,200	3,570	3,066	2,606	1,134	964	4,140	3,519						
	602	S. C. Coach	8,190	7,453	8,000	6,800	5,840	4,964	2,160	1,836	8,000	6,800						
	603	S. C. Coach	8,190	7,453	8,000	6,800	5,840	4,964	2,160	1,836	8,000	6,800						
	700	F. C. Coach	6,390	4,856	6,700	5,360	4,891	3,913	1,809	1,447	6,650	4,788						
	702	F. C. Coach	6,840	6,224	7,000	5,600	5,110	4,088	1,890	1,512	7,300	6,205						
7 and 8			37,470	32,580	37,100	30,370			10,017	8,200	37,810	30,790	10,079	8,764	10,017	8,200	10,171	8,282
	2	M. & B.	2,700	2,457	3,500	1,925	1,736	955	1,764	970	3,600	1,800						
	3	M. & B.	2,700	1,350	3,500	2,275	1,736	1,128	1,764	1,147	3,500	1,750						
	54	S. C. Ch.	4,320	2,160							4,320	2,160						
	55	S. C. Ch.	4,320	2,160	4,200	2,520	2,083	1,250	2,117	1,270								
	58	S. C. Ch.			4,500	2,700	2,232	1,339	2,268	1,361	4,600	2,300						
	224	F. C. Ch.	5,760	2,880	5,800	3,480	2,877	1,726	1,923	1,754	5,760	2,880						
	225	F. C. Ch.	5,760	2,880							5,760	2,880						
	227	F. C. Ch.			5,800	2,900	2,877	1,438	2,923	1,462								
5 and 6			25,560	13,887	27,300	15,800			13,759	7,964	27,540	13,770	12,780	6,944	13,759	7,964	14,153	7,076
	305	Dining Car									16,000	15,520					15,453	14,989
	303	Dining Car	5,400	2,700									5,400	2,700				
	302	Officers' Car			6,000	3,000	4,836	2,418	1,164	582	2,000	1,940						
	555	Officers' Car	12,000	9,600	9,500	8,075	7,657	6,508	1,843	1,567	12,000	6,000	2,280	1,824				
			17,400	12,300	15,500	11,075			3,007	2,149	14,000	7,940			3,007	2,149	2,538	1,440

SLEEPING CARS:																	
	S. S. Marie	15,200	11,552	15,200	9,120	11,096	6,658	4,104	2,462	15,200	10,944						
	Houghton	15,200	11,552	15,200	9,120	9,044	5,426	6,156	3,694	15,200	10,944						
	Duluth	15,200	11,552	15,200	9,120	9,044	5,426	6,156	3,694	15,200	10,944						
	Ishpeming			15,200	9,120	11,096	1,658	4,104	2,462								
	Superior	15,200	11,552	15,200	9,120	11,096	6,658	4,104	2,462	15,200	10,944						
	Newberry	16,500	14,190	16,400	13,120	11,972	9,578	4,428	3,542	16,500	13,200						
	Negaunee	16,500	14,190	16,400	13,120	11,972	9,578	4,428	3,542	16,500	13,200						
		93,800	74,588	108,800	71,840			33,480	21,858	93,800	70,176	30,250	24,055	33,480	21,858	21,124	15,804
Total value of Passenger Equipment Apportioned to Wisconsin												60,789	44,287	60,262	40,188	63,439	47,591

—107—

RECAPITULATION

	1911		1912		1913	
	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
	$	$	$	$	$	$
Total Passenger Equipment in Michigan and Wisconsin	397,030	265,140	481,730	323,542	471,441	319,825
Total Passenger Equipment Apportioned to Wisconsin	60,789	44,287	60,262	40,188	53,439	47,591
Total Apportioned to Michigan	336,241	220,853	421,468	283,354	408,002	272,234

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS

Schedule No. 32
FREIGHT TRAIN CARS

Freight Equipment				Riggs—1911 Exhibit 1			Hansel—1912 Exhibit 15			Riggs—1913 Exhibit 1-A			1911			1912			1913		
Kind of Cars Series No.	Y'r Blt.	Lgth.	Capacity	Price Incl. A.B.	Quantity	Value of Air Brakes	Price Incl. A.B.	Quantity	Value of Air Brakes	Price Incl. A.B.	Quan. tity	Value of Air Brakes	C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
		Ft.	Lbs.	$		$	$		$	$		$	$		$	$		$	$		$
BOX CARS:																					
3510-3574	1881	33	30,000	573	6	165	510	6	210	573	6	165	3,438	40	1,474	3,660	40	1,590	3,438	40	1,474
3600—4354	1888	33	50,000	573	191	5,252	735	181	6,335	573	150	4,152	109,443	40	46,928	133,035	40	57,015	85,950	40	36,871
8000—8198	1893	33	50,000	573	98	2,695	735	96	3,360	573	94	2,585	56,154	40	24,079	70,560	40	30,240	53,862	40	23,096
8200-8598	1895	33	50,000	573	190	5,225	735	187	6,545	573	182	5,005	108,870	40	46,683	137,445	50	58,905	104,286	40	44,717
45000-45198	1893	33	50,000	573	96	2,640	735	95	3,325	573	91	2,502	55,008	40	23,587	69,825	40	29,925	52,143	x 40	22,358
11001-11199	1905	36	60,000	666	195	5,362	810	193	6,755	666	193	5,308	129,870	69	91,272	156,330	61	97,996	123,538	61	80,478
11200-11598	1909	36	60,000	666	400	1,000	810	399	13,965	666	399	10,972	266,400	88	235,752	323,190	78	255,161	265,734	78	209,686
11000&11458	1911	36	60,000				810	2	70	666	2	55				1,620	88	1,434	1,332	88	1,179
11197	1911	36	60,,00				810	1	35	666	1	28				810	88	717	666	88	589
11155	1912	36	60,000							666	1	28							666	94	628
780	1913	Supply Car								822	1	28							822	100	822
Total					1,176	32,339		1,160	40,600		1,120	30,828	729,183		469,775	896,475		532,983	697,437		421,898
FLAT CARS:																					
1001-1449	1887	34	40,000	398	306	8,415	485	300	10,500	398	297	8,168	121,788	40	53,764	145,500	40	64,500	118,206	40	52,183
1450-1793	1882	34	40,000	398	28	770	485	28	980	398	27	742	11,144	40	4,919	13,580	40	6,020	10,746	40	4,744
1800-1823	1895	36	50,000	398	20	550	560	20	700	398	20	550	7,960	40	3,514	11,200	40	4,900	7,960	40	3,514
1825-1879	1900	36	50,000	398	29	797	560	28	980	398	28	770	11,542	51	6,277	15,680	45	7,595	11,144	45	5,438
12000-12099 steel	1906	40	60,000	462	99	2,722	610	99	3,465	750	99	2,722	45,738	73	34,128	60,390	65	40,466	74,250	65	49,215
6000-6049	1906	36	50,000	398	50	1,375	560	50	1,750	398	50	1,375	19,900	73	14,898	28,000	65	18,812	19,900	65	13,416
12072	1911	36	50,000				560	1	35	398	1	28				560	88	497	398	88	354
13000-13099	1912	41	80,000							727	100	2,750							72,700	94	68,503
7764&777	1912	Pintsch Gas Flasks								200	2	55							400	94	379
769	1912	Pintsch Gas Flasks								387	1	28							387	94	365
Total					532	14,629		526	18,410		625	17,188	218,072		117,496	274,910		142,790	316,091		198,111

GONDOLA CARS:																					
1829–1880	1899	36	50,000	532	19	522	685	19	665	532	19	522	10,108	48	5,123	13,015	42	5,852	10,108	42	4,548
2001–2024	1887	34	40,000	462	21	577	635	20	700	462	20	550	9,702	40	4,227	12,700	40	5,500	9,240	50	4,026
10000–10039	1905	40	80,000	788	40	1,100	810	40	1,400	788	40	1,100	31,520	69	22,090	32,400	61	20,310	31,520	61	19,656
10040–10139	1907	40	80,000	788	99	2,722	810	98	3,430	788	98	2,695	78,012	78	6,448	79,380	70	56,595	77,224	70	54,865
Total					179	4,921		177	6,195		177	4,867	129,342		92,888	137,495		88,257	128,092		83,095
COAL CARS:																					
800–834	1890	34	40,000	443	32	880	560	32	1,120	443	32	880	14,176	40	6,198	17,920	40	7,840	14,176	40	6,198
835–844	1906	34	60,000	543	10	275	685	10	350	543	10	275	5,430	73	4,038	6,850	65	4,575	5,430	65	3,626
845–854	1907	34	40,000	443	10	275	560	10	350	443	10	275	4,430	78	3,516	5,600	70	4,025	4,420	70	3,183
Total					52	1,430		52	1,820		52	1,430	24,036		13,752	30,370		16,440	24,036		13,007
REFRIGERATOR CARS:																					
5001–5014	1888	33	50,000	605	6	165	835	6	210	605	6	165	3,630	40	1,551	5,010	40	2,130	3,630	40	1,551
5015–5024	1901	36	60,000	1,000	9	247	1,085	9	315	1,000	9	248	9,000	54	4,974	9,765	48	4,851	9,000	48	4,449
5025–5034	1907	36	60,000	1,000	10	275	1,085	10	350	1,000	10	275	10,000	78	7,860	10,850	70	7,700	10,000	70	7,083
Total					25	687		25	875		25	688	22,630		14,385	25,625		14,681	22,630		13,083
CHARCOAL CARS:																					
3003–3031	1880	33	30,000	350	3	82	485	1	35	350	1	28	1,050	40	469	485	40	215	350	83	157
1881–1885	1910	36	50,000	440	5	137	535	5	175	440	5	138	2,200	94	2,076	2,675	83	2,250	2,200	40	1,849
Total					8	219		6	210		6	166	3,250		2,545	3,160		2,465	2,550		2,006
CABOOSES:		Type																			
500	1888	4	wheel	550	1		535	1	35	550	1		550	40	220	535	65	360	550	40	220
501	1882	4	wheel	550	1		535	1	35	550	1		550	40	220	535	65	360	550	40	220
502–503	1893	4	wheel	550	2		535	2	70	550	2		1,140	40	440	1,070	65	720	1,100	40	440
505–510	1888	4	wheel	550	5		535	5	175	550	5		2,750	40	1,100	2,675	65	1,800	2,750	40	1,100
511	1900	4	wheel	550	1		535	1	35	550	1		550	51	280	535	70	385	550	45	248
512	1888	4	wheel	550	1		535	1	35	550	1		550	40	220	535	65	360	550	40	220
520–521	1900	4	wheel	550	2		535	2	70	550	2		1,100	51	561	1,070	70	770	1,100	45	495
523–524	1901	4	wheel	550	2		535	2	70	550	2		1,100	54	594	1,070	70	770	1,100	48	528
525–526	1906	4	wheel	550	2		535	2	70	550	2		1,100	73	803	1,070	70	770	1,100	65	715
550–565	1888	8	wheel	900	13		915	13	455	900	13		11,700	40	4,680	11,895	65	7,891	11,700	40	4,680
566–567	1910	8	wheel	900	2		915	2	70	900	2		1,800	94	1,692	1,830	85	1,566	1,800	83	1,494
568–569	1911	8	wheel	900	2		915	2	70	900	2		1,800	100	1,800	1,830	90	1,654	1,800	88	1,584
704	1888	8	wheel	900	1								900	40	360						
Total					35			34	1,190		34		25,550		12,970	24,650		17,406	24,650		11,944

Freight Equipment				Riggs—1911 Exhibit 1			Hansel—1912 Exhibit 15			Riggs—1913 Exhibit 1-A			1911			1912			1913		
Kind of Cars Series No.	Y'r Blt.	Lgth.	Capacity	Price Incl. A B.	Quantity	Value of Air Brakes	Price Incl. A.B.	Quantity	Value of Air Brakes	Price Incl. A.B.	Quan. tity	Value of Air Brakes	C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
		Ft.	Lbs.	$		$	$		$	$		$	$		$	$		$	$		$
ORE CARS:																					
03700-04213	1888	22	40,000	456	266	7,315	535	203	7,105	456	138	3,795	121,296	40	52,907	108,605	40	47,705	62,928	40	27,448
04214-04264	1909	22	50,000	456	51	1,402	585	51	1,785	456	51	1,402	23,256	88	20,633	29,835	50	15,810	23,256	78	18,448
04265-04274	1909	22	50,000	456	10	275	585	10	350	456	9	248	4,560	88	4,046	5,850	65	3,925	4,104	78	3,256
04275-04283	1909	22	50,000	456	9	247	585	9	315	456	9	248	4,104	88	3,641	5,265	65	3,533	4,104	78	3,256
7000-7040	1892	22	50,000	456	3	82	585	3	105	456	3	82	1,368	40	596	1,755	40	765	1,368	40	596
7100-7500	1899	25	60,000	476	401	11,027	610	401	14,035	476	398	10,945	190,876	48	97,354	244,610	50	129,323	189,448	42	85,916
7501-7800 steel	1910	21	80,000	905	300	8,250	960	300	10,500	905	300	8,250	271,500	95	258,337	288,000	75	218,625	271,500	83	226,748
9000-9399 steel	1913	22	100,000							943	400	11,000							377,200	100	377,200
Total					1,040	28,598		977	34,195		1,308	35,970	616,960		437,514	683,920		419,686	933,908		742,868

RECAPITULATION

	1911		1912		1913		1911		1912		1913	
	Quantity	Value of Air Brakes	Quantity	Value of Air Brakes	Quantity	Value of Air Brakes	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.
		$		$		$	$	$	$	$	$	$
Box Cars	1,176	32,339	1,160	40,600	1,120	30,828	729,183	469,775	896,475	532,983	697,437	421,898
Flat Cars	532	14,629	526	18,410	625	17,188	218,072	117,496	274,910	142,790	316,091	198,111
Gondola Cars	179	4,921	177	6,195	177	4,867	129,342	92,988	137,495	88,257	128,092	83,095
Coal Cars	52	1,430	52	1,820	52	1,430	24,036	13,752	30,370	16,440	24,036	13,007
Refrigerator Cars	25	687	25	875	25	688	22,630	14,385	25,625	14,681	22,630	13,083
Charcoal Cars	8	219	6	210	6	166	3,250	2,545	3,160	2,465	2,550	2,006
Cabooses	35		34	1,190	34		25,550	12,970	24,650	17,406	24,650	11,944
Ore Cars	1,040	28,598	977	34,195	1,308	35,970	616,960	437,514	683,920	419,686	933,908	742,868
Total Freight Equipment	3,047	82,823	2,957	103,495	3,347	91,137	1,769,023	1,161,325	2,076,605	1,234,708	2,149,394	1,486,012

	1911	1912	1913	1911		1912		1913					
				C.R.	P.V.	C.R.	P.V.	C.R.	P.V.				
Value of freight train cars (excluding caboose and ore cars) apportioned to Wisconsin on freight car mile basis; Freight car mileage in Wisconsin to freight car mileage on whole line (Ore car mileage excluded)	15.87%	16.75%	15.87%	178,777	112,810	229,146	133,601	188,986	116,041				
Value of caboose cars apportioned to Wisconsin on freight train mile basis; freight-train mileage in Wisconsin to freight-train mileage on whole line				5,099	2,589	4,555	3,217	4,043	1,959				
Total deduction allowed on account of (trial) equipment is in Wisconsin				183,876	115,399	233,701	136,818	193,029	118,000	183,876	115,399	233,701	136,818	193,029	118,000
Total appraised value of freight train cars in Michigan										1,585,147	1,045,926	1,842,904	1,097,890	1,956,365	1,368,012

COMPARISON OF THE 1911, 1912 AND 1913 APPRIASALS — MISCELLANEOUS EQUIPMENT

Series No.	Description	Yr. Blt.	1911 Quantity	1911 Cost	1912 Quantity	1912 Cost	1913 Quantity	1913 Cost	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
				$		$		$	$		$	$		$	$		$
3513–4336	Boarding Cars (Box)	1888	47	530	34	675	29	530	24,910	50	12,455	22,950	40	9,180	15,370	50	7,685
1095–1760	Boarding Cars (Flat)	1887	11	440	10	450	9	440	4,840	50	2,420	4,500	40	1,800	3,960	50	1,980
9000–9003	Cinder Cars	1894	4	375	4	525			1,500	50	750	2,100	40	840	(See series		772-775)
9004–9005	Cinder Cars	1907	2	375	2	525			750	78	585	1,050	73	767	(See series		770-771)
772–775	Cinder Cars	1894					4	375	(See series No. 9000-9003)						1,500	50	750
770–771	Cinder Cars	1907					2	375	(See series No. 9004-9005)						750	50	375
700–728	Tool Cars (Box)	1882	3	530	3	675	3	530	1,590	50	795	2,025	40	810	1,590	50	795
701	Wrecking Coach	1872	1	2,000	1	3,000	1	2,000	2,000	50	1,000	3,000	33⅓	1,000	2,000	50	1,000
702	Wrecking Derrick	1894	1	1,600	1	1,500	1	1,600	1,600	50	800	1,500	60	900	1,600	50	800
703	Truck Car	1882	1	440	1	450	1	440	440	50	220	450	40	180	440	50	220
704	Tool Car (Box)	1882	1	530	1	675	1	530	530	50	265	675	40	270	530	50	265
705	Derrick Car (Hand)	1889	1	150	1	450	1	150	150	50	75	450	40	180	150	50	75
706–709	Steam Shovel, Bucyrus 1½ c. y.	1894	2	5,500	2	5,000	1	5,500	11,000	60	6,600	10,000	65	6,500	5,500	60	3,300
707	Derrick Car	1882	1	440	1	400	1	440	440	50	220	400	40	160	440	50	220
708–729	Boarding Car (Box)	1874	7	530	7	675	6	530	3,710	50	1,855	4,725	40	1,890	3,180	50	1,590
709	Derrick	1894					1	5,000	(See series No. 706-709)						5,000	65	3,250
710	Pile Driver	1893	1	4,100	1	4,500	1	4,100	4,100	50	2,050	4,500	70	3,150	4,100	50	2,050
711	Rotary Snow Plow	1888	1	15,000	1	15,000	1	15,000	15,000	50	7,500	15,000	80	12,000	15,000	50	7,500
719	Snow Plow	1882	1	300	1	300	1	300	300	50	150	300	40	120	300	50	150
720	Ditcher	1886	1	700	1	700	1	700	700	50	350	700	40	280	700	50	350
721	Snow Crab	1882	1	400	1	400	1	400	400	50	200	400	40	160	400	50	200
724	Snow Plow	1895	1	1,000	1	1,000	1	1,000	1,000	50	500	1,000	40	400	1,000	50	500
725	Gravel Spreader	1888	1	300	1	460	1	300	300	50	150	460	40	180	300	50	150
726–727	Snow Widener	1881	2	400	2	460	2	400	800	50	400	920	40	368	800	50	400
730	Pile Driver Tank	1893	1	700	1	850	1	700	700	50	350	850	40	340	700	50	350
731	Boarding Car	1909	1	250	1	675	1	250	250	90	225	675	40	270	250	90	225
	Snow Plows for Locomotives		75	150	75	150	75	150	11,250	60	6,750	11,250	85	9,563	11,250	60	6,750
	Snow Covers for Tenders			Omitted			75	50							3,750	60	2,250
732	Tool Car	1888	See 35 13 4336		1	675	1	530				675	40	270	530	50	265
733	Tool Car	1911	See351 3-4336		1	675	1	175				675	90	608	175	100	175
734–744	Boarding Car	1912	See351 3-4336		6	800	5	250				4,800	95	4,560	1,250	100	1 2,50
735–747	Boarding Car	1888	See351 3-4336		8	675	8	530				5,400	40	2,160	4,240	40	1,696

748	Boarding Car	1887	See351	3-4336	1	675	1	440				675	40	270	440	60	264
749	Snow Plow	1912			1	500	1	500				500	95	475	500	100	500
751-768	Boarding Cars	1912					18	250							4,500	100	4,500
778-788	Boarding Cars	1913					8	250							2,000	100	2,000
781	Tool Car	1913					1	250							250	100	250
1	American Ditcher	1913					1	6,426							6,426	100	6,426
782	Br. & Bldg. Dept. Compressor Car	1913					1	1,400							1,400	100	1,400
	Marion Cinder & Ballast Unloader—actual cost	1912					1	575							575	100	575
1488 (70C)	Steam Shovel	1912			1	9,500	1	9,591				9,500	95	9,025	9,591	95	9,111
	Locomotive bucket crane (Industrial works)	1912			1	9,972						9,972	95	9,373	(Included in fuel stas)		
	Total number of cars exclusive of Loco. Snow Plow and Covers for Tenders		93		99		120										
	Tools in Wrecking Train Tool Car								2,076	80	1,661	2,085	80	1,668	2,076	80	1,661
	Total Value of all Miscellaneous Equipment								90,336		48,326	124,162		79,821	114,513		73,253
	Value Apportioned to Wisconsin		19	.0%	17.1%		18.13%		17,164		9,182	21,232		13,649	20,761		13,281
	Miscellaneous Equipment Apportioned to Michigan								73,172		39,144	102,930		66,172	93,752		59,972

Schedule No. 34
FERRIES AND STEAMSHIPS

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS

Riggs—1911—Exhibit 1

Name	St. Ignace	Ste. Marie	Chief Wawatam
Dimensions	215'x52'x15'-8"	288'x53'x19'-6"	352'x62'x25'
Material	Wood	Wood	Steel
Engines	2 compound	2 compound	3 triple
	(1) 26"x48"x40"	(1) 30"x56"x48"	21"—33"—52"x40"
	(1) 28"x53"x48"	(1) 28"x56"x40"	
Boilers	3 Scotch	4 Scotch	6 Scotch
	11'—6"x18'—0"	11'—6"x18'—0"	13'—6"x11'—6"
	125lbs	125 lbs	185 lbs
Propellers	2	2	3
Tracks	2	3	4
Car capacity	10—12	18—20	26—28
When built	1888	1893	1911
Cost of reproduction	$205,000	$265,000	$390,000
Percentage	25%	35%	100%
Present value	$51,250	$92,750	$390,000

Included in Schedule No. 26 Docks and Wharves

Hansel—1912—Exhibit 15

THE MACKINAC TRANSPORTATION CO.
Property in Michigan

Vessels		
St. Ignace	215'x52'x15'-8"	
	Wood	
	2 compound	
	(1) 26"x48"x40"	
	(1) 28"x53"x48"	
	3 Scotch	
	11'-6"x18'-0"	
	125 lbs	
	2	
	2	
	10—12	
	1888	
	$205,000	
	25%	
	$51,250	
Chief Wawatam	352'x62'x25'	
	Steel	
	3 triple	
	21"—33"—52"x40"	
	6 Scotch	
	13'-6"x11'-6"	
	185 lbs	
	3	
	4	
	26—28	
	1911	
	$390,000	
	95%	
	$370,500	

Docks and Wharves, St. Ignace			
Coal pockets, timber and piles	17,743	50	8,872
Buckets	1,100	30	330
Dump car track and switches	341	75	256
Dump cars	525	53	278
Derrick hoists	2,000	50	1,000
Hoisting plant	1,265	75	949
	22,974		11,685
Total	617,974		433,435
Overhead charges on above—total 20%	123,595		123,595
Total in Michigan	$741,569		$557,030

Riggs—1913—Exhibit 1-A

Chief Wawatam			
Actual cost (1912)	$390,000	95	$370,500
Saint Marie			
Actual cost (1913)	279,000	100	279,000
Total	$669,000		$649,500
D.S.S.& A., ⅓ interest	223,000		216,500
Total Freight and Passenger	223,000		216,500

Note:
The Sainte Marie shown in 1911 appraisal was scrapped in 1912.
The St. Ignace was sold in April, 1913.

Included in Schedule No. 26, Docks and Wharves.

RECAPITULATION — FERRIES AND STEAMSHIPS

	1911			1912			1913		
	C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
Car Ferry—St. Ignace	$205,000	25	$ 51,250	$205,000	25	$ 51,250	Sold in 1913		
Car Ferry—Ste. Marie—Old	265,000	35	92,750	Scrapped in 1912			Scrapped in 1912		
Car Ferry—Chief Wawatam	390,000	100	390,000	390,000	95	370,500	390,000	95	370,500
Car Ferry—Sainte Marie—New							279,000	100	279,000
Total	860,000		534,000	595,000		421,750	669,000		649,500
D., S. S. & A.—½ interest	286,667		178,000				223,000		216,500
Docks and Wharves at St. Ignace	Included in No. 26			22,974		11,685	Included in No. 26		
Total—Hansel				617,974		433,435			
Overhead charges on above—20%				123,595		123,595			
Total in Michigan				741,569		557,030			

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911			1912			1913		
			C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
					$	$		$	$		$
Under this caption is included the interest of the Duluth, South Shore and Atlantic R'y in the Terminal Station at Sault Ste. Marie, incorporated as the "Sault Ste. Marie Union Depot Company" and owned jointly by the D., S. S. & A. R'y and the M., St. P. & S. S. M. R'y, each company owning a half interest, and also the company's interest in the International Bridge, which is separately incorporated and jointly owned by the D., S. S. & A. R'y, Candaian Pacific and M. ,St. P. & S. S. M. R'y.	All property of the Sault Ste. Marie Union Depot Co. and The New Jersey Bridge Construction Co. is shown in Appendix.	Same as Exhibit 1.									
SAULT STE. MARIE UNION DEPOT CO.											
Right of Way: Total of $33,015 included in general schedule No. 1 "Right of Way."	Right of Way: Tract of land fronting on Portage Avenue, Sault Ste. Marie, extending from Magazine St. to near Meridian St., 1,850 lin. ft. front, depth varying from 110 ft. to 250 ft., 1,850 ft. @ $30 Frontage on Ridge St. for 110 ft. @ $10					55,500 1,100	100 100	55,500 1,100			
Grading: Tracks, yards, driveways, and grading around station—actual cost	For tracks, yards, driveways and Station Grounds	Allocated as follows: Freight and Passenger 11.5% of $13,964 $1,606 Freight 45.5% of 13,964 6,354 Pass'gr 43.0% of 13,964 6,004	13,964		13,964	14,000	100	14,000	13,964	100	13,964

THIS PAGE BO

Tracks (Not included in any other track schedules)	Pass.	Frt.	F.& P.																
Main line 0.00 to depot			2,785																
Spur west end of depot	570																		
Crossover at depot	193																		
Car cleaning track	926																		
North team track		1,081																	
South team track		748																	
Standard oil spur		916																	
Minn. Br'g Co.		393																	
Wheel Pit spur			372																
Passing siding, W. of Main			991																
Freight track		871																	
Freight house sidg.		614																	
Freight house spur		1,262																	
Hammond Standish Spur		774																	
	1,689	6,659	4,148																
Passenger tracks	1,689																		
Freight tracks	6,659																		
Freight and Passenger	4,148																		
	12,496 lin. ft. @$1.15 per ft.			Track, 12,500 lin. ft. complete, exclusive of grading															
Note:—Actual cost of material and labor exclusive of grading, was $14,682.59.																			
Buildings:																			
Passenger station—Brown stone, slate roof, first floor 44½x187 ft.—Second floor, 44½'x51½'—Inside woodwork, oak, map ple flooring—Toilets tile floors—Electric lights—Heat from separate plant—Actual cost				Same															

	Ft.	Allocation											
Main track	1,474	F.& P.											
Main track	1,311	Pass.											
Station No. 1	571	Pass.											
Crossover at sta.	192	Pass.											
Car cleaning No. 1	929	Pass.											
North team track	1,026	F.											
South team track	748	F.											
Standard oil spur	1,031	F.											
Beerhouse spur	393	F.											
Wheel pit spur	375	Pass.											
Station tk. No. 2	1,006	Pass.											
Car cleaning No. 2	865	Pass.											
Freight house spur	614	F.											
Freight house spur	1,264	F.											
Warehouse spur	774	F.											
Pintsch Gas Co.	290	Pass.											
	Ft.	C.R.	P.V.										
Passenger trk.	5,539	$6,370	5,783										
Freight	5,850	6,727	6,107										
Freight and Passenger	1,474	1,695	1,539										
	12,863	14,792	13,429	14,370	90	12,933	14,500	85	12,325	14,792		13,429	
Same—Allocated to Passenger				30,974	100	30,974	31,500	90	28,350	30,974	95	29,425	

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
			$		$	$		$	$		$
Heating plant—Brick with heating apparatus—actual cost	Same	Heating plant and ice house, frame building 21.5'x 106.5', 61'x16'x 18', with heating apparatus—actual cost	7763	95	7,375	7,750	90	6,975	7,763	95	7,375
Oil House:											
Cement Block Building—actual cost	Same	12'x20', cement platform 6'x20'—actual cost	1,226	90	1,103	1,230	90	1,107	1,226	90	1,103
Immigration Building:											
Cement block, asbestos, shingle roof, 22'x35' Georgia pine finish—steam heat—water in building—Floor Tennessee marble—actual cost	Same	24.5'x38'—931 sq. ft.—actual cost	2,605	95	2,475	2,600	95	2,470	2,605	95	2,475
Freight Depot and Office:	Same	Freight Office—frame, shingle roof B. & B. 22'x62'x16'—1,364 sq. ft. @ $1									
Old passenger depot:		Freight house frame R.R.R. built 1901, 26'x100'x12'—2,600 sq. ft. @ $1							1,364	75	1,023
Cost of reproduction (1900) $3,700		Freight Platform 12'x62', 24'x200', 8'x100'—8,344 sq ft. @ 25c							2,600	85	2,210
Cost of additions 2,862									2,086	75	1,564
$6,562											
Estimated cost of reproduction as building now stands		Total cost of freight station....	6,000	90	5,400	6,000	80	4,800	6,050		4,797
Sewer System and Water Supply—actual cost	Same	Same	3,669	95	3,485	5,700	90	5,130	3,669	95	3,485
Fences, snow fences, street crossings and signs—actual cost	Sidewalks, platforms, fences, street crossings and signs	Same as Exhibit 1	790	90	711	1,500	90	1,350	790	90	711
Sidewalks, platforms, etc., estimated	Included in above item	Sidewalks and platforms—estimat.	750	90	675				750	90	675
		Total freight and Passenger $17,499 $16,494									
		Engineering 4% 700 700									
		$18,199 $17,194									

		Total freight	19,131	17,258						
		Engineering 4%	765	765						
			$19,896	$18,023						
		Total passenger	45,953	43,687						
		Engineering 4%	1,838	1,838						
		Passenger	47,791	45,525						
		Freight	19,896	18,023						
		Freight and Passenger	18,199	17,194						
Total					82,111	79,095	141,380	133,107	82,583	77,439
Engineering, 4%	Overhead charges, 20% of total		85,886	80,742	3,284	3,284	28,276	28,276	3,303	3,303
Total in Michigan					85,395	82,379	169,656	161,383	85,886	80,742
D., S. S. & A. Proportion—½ interest					42,698	41,190			42,942	40,371
INTERNATIONAL BRIDGE COMPANY	NEW JERSEY BRIDGE CONSTRUCTION CO.									
This company owns:	Property in Michigan									
1. Bridge over Portage Ave., 55 ft. deck plate girder span on concrete abutment										
2. Draw bridge over U. S. Government Ship Canal—398' span pivoted on center pier—concrete pier and abutments.										
3. Ten (10) through truss spans over St. Mary's River—each 239 ft. long—2 concrete abutments—9 stone piers.										
4. Draw bridge over Canadian Ship Canal.										
5. Embankments between the various bridges.										
6. Track:										
For the purpose of this appraisal, it is assumed that the embankment and draw bridge in Canada does not concern us, that we take account of the actual structure wholly in Michigan, and that the total cost of the St. Mary's River Bridge should be pro rated between Canada and Michigan in proportion to the actual length in each.										

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
			$		$	$		$	$		$
		INTERNATIONAL BRIDGE CO. All Freight and Passenger									
St. Mary's River Bridge:											
Excavation, 651 c.y., rock and bldr. @ $2.00	650 c. y. rocks and	As per	1,302	100	1,302	1,300					
Lumber (caissons), 155,720 F.B.M. @ $36.64 per M.	boulders @ $2.00 per yd.	Exhibit 1 $271,601 $230,489									
	154 M.B.M. lumber $40.00 per M.	Deduct guard rail and track spks. 726 691	5,706	80	4,565	6,160					
Dimension stone masonry, 2,998 c. y. @ $12.00 per c. y.	3,000 c. y. 12.00 per c. y	Ex. 50	35,976	100	35,976	36,000			270,875		229,798
Concrete masonry, 1,293 c.y. @ $9 per c. y.	1,400 c. y. 8.00 per c. y.	270,875 229,798	11,637	100	11,637	11,200					
Rubble stone masonry, 110 c.y. @ $5.00 per c. y.			550	100	550						
Wrought iron, 3,893 lbs @ 0.04c per lb	11,000 lbs 0.03½ per lb		156	80	125	390					
Steel, 4,711,340 lbs @ 0.04¼c. per lb	4,712,000 lbs 0.04¼ per lb		200,232	80	164,897	200,260					
Ties, 1,814—304,752 F.B.M. @$43.64 per M.	120 M.B.M. 34.00 per M.		13,299	70	9,309	4,080					
Guard rail, 40,500 F.B.M. @ $43.64 per M.	19.5 M.B.M. 43.00 per M.		1,767	70	1,237	840					
Boat spikes, 7,143 lbs @ 0.03½c per lb			250	80	200						
60 lb guard rail, 43.4 tons @ $14 per ton			608	100	608						
Track spikes, 56.42 cwt. @ $2.10 per cwt.			118	70	83						
80% of the length of this bridge is in Mich. 20% in Canada.			271,601		230,489	260,230	80	208,184	270,875		229,798
Michigan Proportion			217,361		198,914	208,184		166,547	216,700		183,838
Portage Avenue Bridge:											
Excavation 267 c. y. @ $ 0.50 per yd.			134	100	134						
Back fill 138 c.y. 0.30 per yd.			41	100	41						
Concrete masonry 332 c.y. 9.00 per yd.			2,988	100	2,988						
Steel 38,670 lbs 0.04 per lb	Included in Schedule No. 5	Included in Schedule No. 5	1,547	100	1,547						
Ties and guard rails 9,841 F.B.M. 43.64 per M.			429	70	300						

Boat spikes 388 lbs	0.03½ lb						14	70	10										
60 lb gd. rail 1.61 tons	14.00 per ton						23	100	23										
Track spks. 2.09 cwt.	2.10 per cwt.						4	70	3										
							5,180		5,046										
Draw Span U. S. Ship Canal:																			
Excavation earth 1,508 c. y.	@ $2.00 per yd.						3,016	100	3,016										
Concrete Masonry 12.5 c. y.	9.00 per yd.	As per Exhibit 1	63,725	59,105			113	100	113										
Stone masonry 1,491 c. y.	12.00 per yd.	Deduct guard rail and track spikes as per Ex. 50	137	130			17,892	100	17,892										
Steel 826,376 lbs	0.04½ per lb						37,187	90	33,882								63,588		58,975
Machinery 14,493 lbs	0.12½ per lb		63,588	58,975			1,812	80	1,450										
Engines, boilers, etc.							675	80	540										
Engine room							280	90	252										
Ties and gd. rail 58,853 F.B.M.	@ $43.64 per M.						2,568	70	1,798										
Boat spks. 1,273 lbs	0.03½ per lb						45	70	32										
60 lb gd. rail 8.20 tons	14.00 per ton						115	100	115										
Track spks. 10.66 cwt.	2.10 per cwt.						22	70	15										
							63,725		59,105								63,588		58,975
Grading:																			
End of D., S. S. & A. track to Portage Ave. Bridge, 15 ft. long, 15 ft. high, 18 ft. road bed 337.5 cu. yd.																			
Portage Ave. Bridge to U. S. Draw Span, 90 ft. long, 15 ft. fill, 18 ft. road bed 2,025.0 cu. yd																			
Draw span to St. Mary's River Bridge, 395 long, average 12 ft., 18 ft. road bed 6,320.0 cu yd..																			
Allowance for shrinkage and overhaul 8,680																			
9,550.5 c. y.																			
@ 30c	10,000 c. y. @ 26c	9,179.5 c. y. @ 30c					2,865	100	2,865	2,600	100	2,600	2,754	100	2,754				

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911 C.R.	1911 %	1911 P.V.	1912 C.R.	1912 %	1912 P.V.	1913 C.R.	1913 %	1913 P.V.
			$		$	$		$	$		$
Clearing and Grubbing—1.26 acres @ $80			101	100	101						
Ties—On embankment, 282 track ties @38½c	Same @ 40c	274 @ 40c	109	80	87	113	70	79	110	80	88
Rail—2,912 lin. ft. of 85 lb rail in 1908—73.6667 tons @ $31.05	Same—74 tons @ $30.30	2842 lin. ft. of 85 lb laid in 1908 71.90 tons @ $31.05	2,287	90	2,132	2,242	90	2,018	2,232	90	2,081
Track Fastenings:											
7.75 tons 44 inch angle bars @$34 per ton	Same		264	90	245	264			372		342
0.739 tons ⅞"x4½" bolts @$52 per ton	Same @ $48.00		38	90	34	35					
35.3 cwt. spikes @ $2.10 per cwt	Same @ $1.90		74	90	67	67					
927 nut locks @ $5.20 per M.	Same		5	100	5	5					
Track Laying and Surfacing:						371	90	334			
0.5515 miles of track @ $526.00 per mile	0.55 mi. @ $600.00	0.5383 mi. @ $526	290	100	290	330	100	330	283	100	283
Ballast:											
311 cu. yds. @ 53½c	Same @ 55c	303 c. y. @ 53½c	166	100	166	171	100	171	162	100	162
Frogs, Switches, etc.	Same		290	90	261	290	80	232	290	90	261
Total tracks, etc.	Outside Bridges		6,489		6,253	6,117		5,764	6,203		5,971
Right of Way:											
Estimated cost of acquisition of right to cross street, ship canal and rapids	Same		10,000		10,000	10,000		10,000	10,000		10,000
		Total							296,491		258,784
		Engineering 4%							11,860		11,860
		Total F. & P.							308,351		270,644
		D., S. S. & A. Proportion (¼)							77,088		67,661

RECAPITULATION

St. Mary's Bridge	217,361	198,914		Freight and Passenger:								
Portage Avenue Bridge	5,180	5,046		Sault Ste. Marie Union Depot Co. (D., S. S. & A.—½ interest)						9,099		8,597
Draw Span, U. S. Ship Canal	63,725	59,105		International Bridge Co. (D., S. S. & A.—¼ interest)						77,088		67,661
Grading, Tracks, etc.	6,489	6,253		Freight:								
Right of Way	10,000	10,000		Sault Ste. Marie Union Depot Co. (D.,S.S.& A.—½ interst)						9,948		9,012
	302,754	279,317		Passenger:								
Engineering, 4%	12,110	12,110		Sault Ste. Marie Union Depot Co. (D.,S.S.& A.—½ interest)						23,895		22,762
	$314,864	$291,427		Ore:								
				None								
D., S. S. & A. Proportion— ½interest in International Bridge			Total		104,954		97,142	286,178	231,813			
D., S. S. & A. Proportion—½ interest in Sault Union Station			Overhead charges, 20% of above total		42,698		41,190	57,236	57,236			
Total in Michigan					147,652		138,332	343,414	289,049	120,030		108,032
Deducted in Exhibit 50					27,834		29,474					
				Total	119,818		108,858	343,414	289,049	120,030		108,032

Schedule	Percentage			Riggs—1911		Hansel—1912		Riggs—1913	
	1911	1912	1913	C. R.	P. V.	C. R.	P. V.	C. R.	P. V.
				$	$	$	$	$	$
1. Right of Way and Station Grounds	5			111,096	111,096				
2. Real Estate not used in Railway Operation	5			637	637				
3. Grading	10	10	10	287,948	285,560	244,231	244,231	295,974	293,599
4. Tunnels	None			0	0			0	0
5. Bridges, Trestles and Culverts	10		10	64,786	40,648			63,224	45,554
6. Ties	5		5	24,635	14,781			28,561	17,136
7. Rails	5		5	75,027	57,618			78,276	61,099
8. Track Fastenings	5		5	11,353	8,732			11,302	8,584
9. Frogs, Switches and Crossings	10	10	10	19,583	11,113			20,370	12,306
10. Ballast	10		10	64,690	64,690			65,775	65,775
11. Track Laying and Surfacing	10		10	25,337	25,337			26,148	26,148
12. Fencing	10		10	10,518	5,418			10,963	8,320
13. Crossings, Cattle Guards and Signs	10		10	1,947	1,312			1,691	1,260
14. Interlocking and Signal Apparatus	10		10	185	154			184	152
15. Telegraph and Telephone Lines	10		10	5,295	3,707			5,296	3,708
16. Side Tracks	10	10	10	75,510	63,123	71,339	71,339	80,044	73,589
17. Station Buildings and Fixtures	10		10	15,898	12,839			17,354	14,347
18. General Office Buildings and Fixtures	None			0	0			0	0
19. Shops, Engine Houses and Turntables	10		10	26,065	18,286			26,530	19,748
20. Shop Machinery and Tools	10	10	10	9,489	7,590	11,455	11,455	11,909	9,914
21. Roadway and Construction Tools	10		10	1,604	1,283			1,604	1,284
22. Water Stations	10		10	9,840	7,679			9,130	7,242
23. Fuel Stations	10		10	10,062	7,546			10,194	7,972
24. Grain Elevators	None			0	0			0	0
25. Warehouses	None			0	0			0	0
26. Docks and Wharves	10		10	124,953	79,431			120,008	63,004
27. Electric Plants	10		10	961	886			961	886
28. Miscellaneous Structures	10		10	18,608	13,383			17,038	12,314
29. Engineering on Roadway and Structures (1912 inc. original survey)	7.9	10	8.8	38,513	38,513	25,500	25,500	35,927	35,927
30. Locomotives	5		5	33,248	22,165			45,378	35,117
31 Passenger Train Cars	5		5	16,812	11,043			20,400	13,612
32. Freight Train Cars	5		5	79,257	52,296			97,818	68,400
33. Miscellaneous Equipment	5		5	3,659	1,957			4,688	2,999

34. Ferries and Steamships	5		5	14,333	8,900			11,150	10,825
35. Engineering on Equipment	5		5	2,946	2,946			3,589	3,589
36. Terminals	7.9		8.8	11,665	10,928			10,562	9,507
37. Contingencies									
38. Legal Expense during Construction		10				7,000	7,000		
39. Organization, Administration and General Expense during Construction		10				10,000	10,000		
40. Interest during Construction		10				80,906	80,906		
41. Furniture and Fixtures		10				1,298	1,298		
42. Stores and Supplies		10				28,006	28,006		
43. Working Capital						10,000	10,000		
Total				1,196,460	991,597	479,735	479,735	1,132,048	933,917

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS

Schedule No. 40
INTEREST AND TAXES

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911		1912		1913	
			C. R.	P. V.	C. R.	P. V.	C. R.	P. V.
			$	$	$	$	$	$
	TAXES:							
	1% on Schedule 1				13,709	13,709		
	On completed Road				50,000	50,000		
	INTEREST:							
	12% on Schedule 1							
	7½% on Schedules 3 and 5							
	9% on Schedule 6							
	6% on Schedules 7, 8, 9							
	3% on Schedules 10, 11, 12, 13, 14							
	12% on Schedule 15							
	6% on Schedule 16							
	4% on Schedules 17, 18, 22, 23, 28							
	3% on Schedules 20, 21, 26, 27							
	7½% on Schedule 29							
	6% on Schedules 35, 37, 38, 39							
7½% of items 1 to 39 inclusive		Same as 1911	1,308,757	1,308,757	745,349	745,349	1,193,679	1,193,679
Total Taxes and Interest			1,308,757	1,308,757	809,058	809,058	1,193,679	1,193,679

Schedule No. 41

COMPARISON OF THE 1911, 1912 AND 1913 APPRAISALS — FURNITURE and FIXTURES

Department	Riggs—1911 Exhibit 1			Hansel—1912 Exhibit 15			Riggs—1913 Exhibit 1-A		
	C.R.	%	P.V.	C.R.	%	P.V.	C.R.	%	P.V.
	$		$	$		$	$		$
President and General Manager's Office	367	75	275	367	75	275	367	75	275
Auditor's Department	1,603	75	1,202	1,611	75	1,208	1,603	75	1,202
Treasurer's Office	481	75	361	481	75	361	481	75	361
Land Department	265	75	199	265	75	199	Moved	to	Duluth
Chief Engineer's Office	246	75	184	246	75	184	in	1912	-13
General Supt's Department	1,111	75	833	1,111	75	833	1,111	75	833
General Roadmaster's Office	123	75	92	123	75	92	123	75	92
Purchasing Dept.	463	75	347	463	75	347	463	75	347
Supt. Motive Power and Machinery	630	75	472	630	75	472	630	75	472
Master Car Builder's Dept.	429	75	322	429	75	322	429	75	322
Storekeeper's Office	102	75	76	102	75	76	102	75	76
Miscellaneous Station Office	7,162	75	5,372	7,154	75	5,366	7,162	75	5,372
Total in Michigan	12,982		9,735	12,982		9,735	12,471		9,352

COMPARISON OF THE 1911, 1912 AND 1913 APPRISALS

Schedule No. 42
STORES AND SUPPLIES

Riggs—1911—Exhibit 1	Hansel—1912—Exhibit 15	Riggs—1913—Exhibit 1-A	1911		1912		1913			
			C.R.	P.V.	C.R.	P.V.	C.R.	P.V.	Total C.R.	Total P.V.
			$	$	$	$	$	$	$	$
		Freight and Passenger								
		Maintenance of Way					78,570	78,570		
		Purchasing Department					71,061	71,061		
		Supply Department					116,540	116,540		
		Engineering Department					100,387	100,387		
		Total					366,558	366,558		
		Apportioned to Michigan 81.87%							300,101	300,101
		Freight:								
		Purchasing Department					1,552	1,552		
		Supply Department					5,236	5,236		
		Total					6,788	6,788		
		Apportioned to Michigan 81.87%							5,557	5,557
		Passenger:								
		Purchasing Department					650	650		
		Supply Department					2,824	2,824		
		Total					3,474	3,474		
		Apportioned to Michigan 81.87%							2,844	2,844
Stores and supplies $277,904	Stores and Supplies on hand June 30, 1912 $337,828	Ore: None								
Apportioned to Michigan 82.9%	Apportioned to Michigan 82.9%		229,271	229,271	280,059	280,059				
Total in Michigan			229,271	229,271	280,059	280,059			308,502	308,502

APPENDIX TO HANSEL APPRAISAL

	C. R.	P. V.
Note:—For the purpose of comparison with the Riggs Appraisals the details of each item are shown in the various Schedules.	$	$
1. The New Jersey Bridge Construction Company. Details in Schedule 36, Terminals. Includes the International Bridge over St. Mary's River, the Draw Span over the U. S. Ship Canal and necessary track and R. of W.	343,414	289,049
2. The Sainte Marie Union Depot Company. Details in Schedule 36, Terminals. Includes land, grading, tracks and buildings	169,658	161,383
3. The Mackinac Transportation Company. Details in Schedule 34, Ferries and Steamships. A. Includes the two ferries St. Ignace and Chief Wawatam. B. Docks and Wharves at St. Ignace which includes Coal Pockets and all equipment used at the coaling stations	741,569	557,030
Total of items included in the Appendix	1,254,641	1,007,462

INDEX TO SCHEDULES

SCHEDULE		PAGE
—	Summary	1
—	Mileage, Main Line, Branches and Traffic Spurs	2–4
1	Right-of-Way and Station Grounds	6–21
2	Real Estate Not Used in Railway Operation	21
3	Grading—Including Clearing and Grubbing	22–33
4	Tunnels	None
5	Bridges, Trestles and Culverts	34–201
	Bridges	34–66
	Trestles	68–147
	Culverts	148–186
	Open Culverts	188–199
6	Ties	202–205
7	Rails	206–211
8	Track Fastenings	212–224
9	Frogs, Switches and Crossings	225–231
10	Ballast	232–236
11	Track Laying and Surfacing	238–240
12	Fencing	242–245
13	Crossings, Cattle Guards and Signs	246–251
14	Interlocking and Signal Apparatus	252
15	Telegraph and Telephone Lines	254–259
16	Side Tracks	260–302
17	Station Buildings and Fixtures	304–322
18	General Office Buildings and Fixtures	None
19	Shops, Engine Houses and Turntables	324–334
20	Shop Machinery and Tools	336–350
21	Roadway and Construction Tools	351
22	Water Stations	352–361
23	Fuel Stations	362–366
24	Grain Elevators	None
25	Warehouses	None
26	Docks and Wharves	368–373
27	Electric Plants	374
28	Miscellaneous Structures	376–399
29	Engineering on Roadway and Structures. (See Summary)	1
30	Locomotives	400–403
31	Passenger Train Cars	404–407
32	Freight Train Cars	408–411
33	Miscellaneous Equipment	412–413
34	Ferries and Steamships	414–415
35	Engineering and Equipment. (See Summary)	1
36	Terminals	416–423
37	Contingencies	424–425
38	Legal Expenses. (See Summary)	1
39	Organization, Administration and General Expenses During Construction. (See Summary)	1
40	Interest and Taxes during Construction	426
41	Furniture and Fixtures	427
42	Stores and Supplies	428
43	Working Capital. (See Summary)	1
—	Appendix—Hansel	429

SUBJECT INDEX

SCHEDULE NO.		PAGE
—	Administration Expenses During Construction. (See Summary)	1
—	Appendix, Hansel	429
10	Ballast	232-236
5	Bridges, Trestles and Culverts	34-301
13	Cattle Guards	246-251
3	Clearing and Grubbing	22-33
37	Contingencies	424-425
13	Crossings, Cattle Guards and Signs	246-251
13	Crossings (Highway)	246-251
9	Crossings (Railroad)	230-231
5	Culverts	148-186
26	Docks and Wharves	368-373
27	Electric Plants	374
19	Engine Houses, Shops and Turntables	324-334
35	Engineering on Equipment (See Summary)	1
29	Engineering on Roadway and Structures (See Summary)	1
12	Fencing	242-245
34	Ferries and Steamships	414-415
9	Frogs, Switches and Crossings	225-231
32	Freight Train Cars	408-411
23	Fuel Stations	362-366
41	Furniture and Fixtures	427
39	General Expenses During Construction (See Summary)	1
3	Grading	22-33
3	Grubbing, Clearing and	22-33
40	Interest and Taxes During Construction	426
14	Interlocking and Signal Apparatus	252
38	Legal Expenses (See Summary)	1
30	Locomotives	400-403
—	Mileage, Main Line, Branches and Traffic Spurs	2-4
33	Miscellaneous Equipment	412-413
28	Miscellaneous Structures, Section Houses, etc.	376-399
5	Open Culverts	188-199
39	Organization, Administration and General Expenses During Construction (See Summary)	1
31	Passenger Train Cars	404-407
7	Rails	206-211
2	Real Estate Not Used in Railway Operation	21
1	Right-of-Way and Station Grounds	6-21
21	Roadway and Construction Tools	351
16	Side Tracks, Mileage and Value	260-302
14	Signal Apparatus	252
13	Signs	246-251
19	Shops, Engine Houses and Turntables	324-334
20	Shop Machinery and Tools	336-350
1	Station Grounds, Right-of-Way and	6-21
17	Station Buildings and Fixtures	304-322
34	Steam Ships (Car Ferries)	414-415
42	Stores and Supplies	428
—	Summary of Appraisals	1
9	Switches	225-229
40	Taxes	426
15	Telegraph and Telephone Lines	254-259
36	Terminals	416-423
6	Ties	202-205
8	Track Fastenings	212-224
11	Track Laying and Surfacing	238-240
5	Trestles	68-147
19	Turntables, Shops and Engine Houses	324-334
22	Water Stations	352-361
26	Wharves, Docks and	368-373
43	Working Capital (See Summary)	1

DISTRICT COURT OF THE UNITED STATES

EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION IN EQUITY

In Chancery Court Case No. 4117

DETROIT SOUTH SHORE & ATLANTIC RAILWAY COMPANY,
Complainant,

vs.

GRANT FELLOWS,
CASSIUS L. GLASGOW,
LAWTON T. HEMANS,
C. S. CUSHINGHAM, *et al.*,
Defendants.

DEFENDANTS' EXHIBIT

PARKER

PRINTED BY
DETROIT LEGAL NEWS CO., 152-156 LIBRARY BOULEVARD
1917

INDEX

1914

Ratios and other data 3- 18

Apportionments of Primary Expense Accounts in detail 19- 22

Maintenance of Way and Structures 23- 58

Maintenance of Equipment 59- 78

Traffic 79- 86

Transportation—Rail Line 87-128

General Expenses 129-150

Apportionment of Primary Expense Accounts—Summary 151

Apporionment of Revenues 151-153

Income Account 155-160

1915

Ratios and other data 161-176

Apportionments of Primary Expense Accounts in detail 177-182

Maintenance of Way and Structures 183-224

Maintenance of Equipment 225-246

Traffic 247-254

Transportation—Rail Line 255-300

Miscellaneous Operations 301-302

General Expenses 303-314

Apportionment of Primary Expense Accounts—Summary 315-322

Apportionment of Revenues 323-324

Income Account 325-330

1916

Ratios and other data.....331-34

Apportionments of Primary Expense Accounts in detail.....347-35

- Maintenance of Way and Structures.....353-39
- Maintenance of Equipment.....395-42
- Traffic.....421-43
- Transportation—Rail Line.....431-48
- General Expenses.....485-50

Apportionment of Primary Expense Accounts—Summary.....503-51

Apportionment of Revenues.....511-51

Income Account.....513-51

1917

Ratios and other data.....519-53

Apportionments of Primary Expense Accounts in detail.....535-54

- Maintenance of Way and Structures.....541-58
- Maintenance of Equiment.....583-60
- Traffic.....609-61
- Transportation—Rail Line.....619-67
- General Expenses.....673-69

Apportionment of Primary Expense Accounts—Summary.....693-70

Apportionment of Revenues.....703-70

Income Account.....707-71

Duluth, South Shore & Atlantic Railway

RATE CASE

COST OF PASSENGER SERVICE

FISCAL YEAR, 1914

BY C. A. PARKER

RATIOS
AND OTHER DATA

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1914.

Ratio No. 1, Michigan Gross Ton Miles on Common Tracks.

	Total	Freight	Passenger
Freight:			
Freight Train Cars	259,003,993	259,003,993	
Train Load	221,440,826	221,440,826	
Locomotives	90,747,956	90,747,956	
Yard Swit'g on Common Tracks	23,529,307	23,529,307	
Train Swit'g on Common Tracks	13,017,768	13,017,768	
Passenger:			
Passenger Train Cars	172,730,543		172,730,543
Train Loads	8,106,050		8,106,050
Locomotives	83,960,512		83,960,512
Yard Swit'g on Common Tracks	457,741		457,741
Train Swit'g on Common Tracks	353,560		353,560
TOTALS	873,348,256	607,739,850	265,608,406
PER CENTS	100.00	69.59	30.41

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1914.

Ratio No. 1 a, Michigan Passenger Gross Ton Miles.

	Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
Passenger Train Cars	172,730,543	71,931,612	22,388,480	78,410,451
Train Load	8,106,050		2,412,698	5,693,352
Locomotives (a)	83,960,512	33,399,492	11,510,986	39,050,034
Yard Switching	457,741	294,556	17,303	145,882
Train Switching	353,560		58,927	294,633
TOTAL	265,608,406	105,625,660	36,388,394	123,594,352
PER CENTS	100.00	39.77	13.70	46.53

(a) Apportioned relatively with the ton-miles of Passenger Train Cars and Loads as follows:

	Car Ton Miles	Load Ton Miles	Total Ton Miles	Per Cent	Locomo've Ton Miles
Sleepers & Diners	71,931,612		71,931,612	39.78	33,399,492
Mail & Express	22,388,480	2,412,698	24,801,178	13.71	11,510,986
Passengers & Bag'ge	78,410,451	5,693,352	84,103,803	46.51	39,050,034
TOTAL	172,730,543	8,106,050	180,836,593	100.00	83,960,512

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1914.

Ratio No. 1 b, Michigan Gross Ton Miles of Passenger Trains Operated on the D. S. S. & A. by the D. S. S. & A.

	Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
Passenger Train Cars	169,425,909	71,611,872	22,365,426	75,448,611
Train Load	7,796,230		2,102,878	5,693,352
Locomotives (a)	81,481,952	32,926,857	11,252,658	37,302,437
TOTALS	258,704,091	104,538,729	35,720,962	118,444,400
PER CENTS	100.00	40.41	13.81	45.78

(a) Apportioned relatively with the ton-miles of Passenger Train Cars and Loads as follows:

	Miles Car Ton	Miles Load Ton	Miles Total Ton	Cent Per	Ton Miles Locomo've
Sleepers & Diners	71,611,872		71,611,872	40.41	32,926,857
Mail & Express	22,365,426	2,102,878	24,468,304	13.81	11,252,658
Passengers & Bag'ge	75,448,611	5,693,352	81,141,963	45.78	37,302,437
TOTALS	169,425,909	7,796,230	177,222,139	100.00	81,481,952

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1914.

Ratio No. 2, Michigan Equated Track Miles of Tracks Maintained by the D. S. S. & A.

	Actual Mileage				Equated Mileage			
	Total	Freight	Com-mon	Pass-enger	Total	Freight	Com-mon	Pass-enger
Main Line	421.25	12.47	408.78		421.25	12.47	408.78	
Second Track	6.55		6.55		6.55		6.55	
Spurs, Industrial	21.35	21.35			10.67	10.67		
Spurs, Mines	22.21	22.21			11.11	11.11		
Sidings	152.07	109.07	40.90	2.10	76.04	54.54	20.45	1.05
TOTALS	623.43	165.10	456.23	2.10	525.62	88.79	435.78	1.05
PER CENTS					100.00	16.89	82.91	0.20

NOTE:—The above equation on the following basis:

Main and Second Tracks	1.00
Spurs and Sidings	.50

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1914.

Ratio No. 3, Michigan Passenger Train Car Miles Including C. M. & St. P. and C. & N. W. Into Marquette.

	Total Car Miles, Michigan			
	Total	Sleepers & Diners	Mail & Express	Pass'gers & Bag'ge
Passenger Cars	1,812,857		30,506	1,782,351
Passenger Cars, Special	706			706
Other Passenger Train Cars,	872,508		544,619	327,889
Other Pass. Train Cars, Special	714			714
Sleepers, Par. & Obser'n, Foreign	243,487	243,487		
Sleepers, Par. & Obser'n, Special				
Diners, Foreign	89,504	89,504		
Sleepers, D. S. S. & A.	524,976	524,976		
Diners, D. S. S. & A.	114,482	114,482		
Observation Diners, D. S. S. & A.	179,879	179,879		
Pass. Cars, C. M. & St. P. and C. & N. W.	63,584			63,584
Other Pass. Train Cars, C. M. & St. P. and C. & N. W.	31,887		1,153	30,734
Slprs., C. M. & St. P & C. & N. W.	4,380	4,380		
TOTALS	3,938,964	1,156,708	576,278	2,205,978
PER CENTS	100.00	29.37	14.63	56.00

Ratio No. 3 a, Michigan Passenger Train Car Miles Excluding the C. M. & St. P. and C. & N. W. Into Marquette.

	Car Miles, Michigan			
	Total	Sleepers & Diners	Mail & Express	Pass'gers & Bag'ge
Total as above	3,938,964	1,156,708	576,278	2,205,978
Deduct C. M. & St. P & C. & N. W.	99,851	4,380	1,153	94,318
TOTALS	3,839,113	1,152,328	575,125	2,111,660
PER CENT	100.00	30.02	14.98	55.00

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Ratio No. 3 b, Michigan Passenger Train Car Miles, D. S. S. & A. Trains on D. S. S. & A Tracks, Exclusive of Sleepers and Diners.

	Total	Passengers & Baggage	Mail & Express
Passenger Train Cars	1,812,857	30,506	1,782,351
Passenger Train Cars, Special	706		706
Other Passenger Train Cars	872,508	544,619	327,889
Other Passenger Train Cars, Special	714		714
TOTAL	2,686,785	575,125	2,111,660
PER CENT	100.00	21.41	78.59

Ratio No. 3 c, System Passenger Car Miles (other than Sleepers and Diners) on the D. S. S. & A. and Mineral Range.

	Car Miles	Per Cent
Michigan D. S. S. & A. Cars on D. S. S. & A.	2,320,455	79.17
Michigan D. S. S. & A. Cars on Mineral Range	136,237	4.65
Outside Michigan D. S. S. & A. Cars on D. S. S. & A.	474,203	16.18
TOTAL	2,930,895	100.00

Ratio No. 3 d, Michigan Passenger Train Car Miles (D. S. S. & A.) Divided to Mail and Express and Passengers and Baggage.

	Car Miles	Per Cent
Mich. Passenger Train Cars, Passenger and Baggage	1,745,330	75.21
Michigan Passenger Train Cars, Mail and Express	575,125	24.79
TOTAL	2,320,455	100.00

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Ratio No. 4, Time of Trains and Switching on Common Tracks in Michigan.

	Mileage	Minutes per Mile	Total Time in Minutes	Passenger Time	Freight Time
Passenger Trains	806,718	2.4862	2,005,662	2,005,662	
Freight Trains	782,236	6.0559	4,737,143		4,737,143
Mixed Trains	17,616	2.9227	51,486	9,098	42,388
Special Passenger	677	2.4862	1,683	1,683	
Special Mixed	550	6.0559	3,331	589	2,742
	1,607,797		6,799,305	2,017,032	4,782,273
Deduct for train left on Exclusive Tracks	4,479	10.	44,790		44,790
	1,603,318		6,754,515	2,017,032	4,737,483
Add Yard Switching on Common Tracks					
Passenger	3,529	10.	35,290	35,290	
Freight	122,848	10.	1,228,480		1,228,480
TOTAL	1,729,695		8,018,285	2,052,322	5,965,963
PER CENT			100.00	25.60	74.40

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Ratio No. 4 a, System Time of Use of Tracks, Passenger and Freight Trains and Yard Switching.

	System Miles	Minutes per Mile	Total Time in Minutes	Passenger Time	Freight Time
Passenger Trains	965,343	2.4862	2,400,035	2,400,035	
Freight Trains	948,600	6.0559	5,744,627		5,744,627
Mixed Trains	17,616	2.9227	51,486	9,098	42,388
Special Passenger	782	2.4862	1,944	1,944	
Special Mixed	659	6.0559	3,991	705	3,286
Pass. Yard Switching	7,765	10.	77,650	77,650	
Freight Yard Switching	236,177	10.	2,361,770		2,361,770
TOTAL			10,641,503	2,489,432	8,152,071
PER CENT			100.00	23.39	76.61

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Ratio No. 10, Michigan Passenger Miles.

	Miles	Per Cent
Intrastate Passengers, One Mile	24,554,687	64.69
Interstate Passengers, One Mile	13,400,992	35.31
TOTAL	37,935,679	100.00

Ratio No. 11, System Revenue Freight Train Miles.

	Miles	Per Cent
Michigan Freight Train Miles	797,192	82.73
Outside Michigan Freight Train Miles	166,454	17.27
TOTAL	963,646	100.00

Ratio No. 11 b, System Revenue Passenger Train Miles.

	Miles	Per Cent
Michigan Passenger Train Miles	779,623	83.08
Outside Michigan Passenger Train Miles	158,749	16.92
TOTAL	938,372	100.00

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Passenger and Freight Switching in Various Yards in Michigan and Ratios No. 13, No. 13 a, No. 13 b and No. 13 c.

	Switching Miles			Passenger Per Cent	Subdivision of Passenger		
	Total	Freight	Passenger		Mail & Express	Sleepers & Din'rs	Pgrs. & B'ge
Marquette	126,125	120,394	5,731	4.54	1.92	57.37	40.71
St. Ignace	46,194	44,160	2,034	4.40	12.93	33.09	53.98
Houghton	17,199	17,199					
Ishpeming-Negaunee	54,424	54,424					
TOTALS	243,942	236,177	7,765	3.18	4.80	51.01	44.19
Train Switching	129,126	126,878	2,248		16.67		83.33
Total All Switching	373,068	220,287	10,013	2.68	7.47	39.59	52.97

Ratio No. 13, Total Switching:

	%
Passenger	2.68
Freight	97.32

Ratio No. 13 a, Yard Switching:

Passenger	3.18
Freight	96.82

Ratio No. 13 b, Yard Switching Assigned to Services:

Mail and Express	4.80
Sleepers and Diners	51.01
Passengers and Baggage	49.19

Ratio No. 13 c, All Switching Assigned to Services

Mail and Express	7.47
Sleepers and Diners	39.59
Passengers and Baggage	52.97

PAGE CUT

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1910.

Ratio No. 17—Allocated Station Pay Roll—Michigan.

	Amount	Per Cent
Allocated Passenger Employees	10,756.74	13.81
Allocated Freight Employees	67,107.81	86.19
TOTAL	77,864.55	100.00

Ratio No. 17 a, Passenger Trainmen's Pay Roll.

	Amount	Per Cent
Conductors, January and May	6,027.65	53.11
Brakemen, January and May	3,274.90	28.85
Baggagemen, January and May	2,047.00	18.04
TOTAL	11,349.55	100.00

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

LOCOMOTIVE MILEAGE
Train and Switching Used in Various Accounts.

	SYSTEM			MICHIGAN		
	Total	Passenger	Freight	Total	Passenger	Freight
Passenger	963,708	963,708		802,737	802,737	
Freight	1,037,173		1,037,173	851,529		851,529
Mixed	18,871	3,334	15,537	18,871	3,334	15,537
Special Passenger	934	934		721	721	
Special Mixed	747	132	615	638	112	526
	2,021,433	968,108	1,053,325	1,674,496	806,904	867,592
Switching:						
Train Pass'ger	2,248	2,248		2,248	2,248	
Train Freight	154,353		154,353	126,878		126,878
Yard Pass'ger	7,765	7,765		7,765	7,765	
Yard Freight	236,177		236,177	236,177		236,177
	400,543	10,013	390,530	373,068	10,013	363,055
M. R. Passenger	42,701	42,701		42,701	42,701	
C. & N. W. Pass.	10,950	10,950		10,950	10,950	
C. M. & St. P. Pass.	20,032	20,032		20,032	20,032	
	30,982	30,982		30,982	30,982	

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Train Mileage and Train Switching Used in Various Accounts.

	SYSTEM			MICHIGAN		
	Total	Passenger	Freight	Total	Passenger	Freight
Trains:						
Passenger	934,361	934,361		775,736	775,736	
Freight	948,600		948,600	782,236		782,236
Mixed	17,616	3,113	14,503	17,616	3,113	14,503
Special:						
Passenger	782	782		677	677	
Mixed	659	116	543	550	97	453
	1,902,018	938,372	963,646	1,576,815	779,623	797,192
Train Switching:						
Passenger	2,248	2,248		2,248	2,248	
Freight	154,353		154,353	126,878		126,878
	156,601	2,248	154,353	129,126	2,248	126,878
M. R. Passenger	42,701	42,701		42,701	42,701	
C. M. & St. P. Pass.	20,032	20,032		20,032	20,032	
C. & N. W. Pass.	10,950	10,950		10,950	10,950	
	30,982	30,982		30,982	30,982	
Light Locomotive) Miles)	relatively with 1916—Locomotive miles; 1.77% Passenger and 4.57% Freight in Michigan.					
Light Locomotive) Miles Special)						
				49,594	13,846	35,748

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Apportionments of Primary Expense Accounts

DETAILS

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

The basic figures, as used in the following computations and divisions of expenses, are used as taken from the books and records of the company, without adjustment for the purpose of reducing them to those necessary for a normal year of operation, and are subject to adjustments to be made to eliminate expenditures to make good deferred maintenance, and those for additions and betterments, etc.

It is the claim of defendants that the expenses in the Maintenance of Way Group of this year were excessive in at least the amount of $202,000.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Accounts Against Which There Are no Charges for the Year.

I. Maintenance of Way and Structures.

No.
8. Tunnels.
15. Electric Power Transmission.

II. Maintenance of Equipment.

No.
28. Electric Locomotives—Repairs.
29. Electric Locomotives—Renewals.
30. Electric Locomotives—Depreciation.
32. Passenger Train Cars—Renewals.
37. Electric Equipment of Cars—Repairs.
38. Electric Equipment of Cars—Renewals.
39. Electric Equipment of Cars—Depreciation.
40. Floating Equipment—Repairs.
41. Floating Equipment—Renewals.
42. Floating Equipment—Depreciation.
44. Work Equipment—Renewals.
47. Power Plant Equipment.
52. Maintaining Joint Equipment at Terminals—Cr.

III. Traffic.

No.
60. Other Expenses.

IV. Transportation.

No.
79. Motormen.
86. Operating Power Plants.
87. Purchased Power.
92. Drawbridge Operation.
95. Operating Floating Equipment.
96. Express Service.

V. General.

No.
111. Relief Department Expenses.

1. MAINTENANCE OF WAY
AND STRUCTURES

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

1. MAINTENANCE OF WAY AND STRUCTURES.
No. 1. Superintendence.

			%	$
1.	System Total, per Annual Report		100.00	23,233
2.	Dividend relatively with the total of charges to Michigan and outside of Michigan in Accounts 2 to 17 inclusive (see detail page following)	$739,225		
3.	Outside Michigan	130,599	17.67	4,105
4.	Michigan	608,626	82.33	19,128
5.	Michigan Total, Line 4		100.00	19,128
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 2 to 17 inclusive (see detail page following)	$608,626		
7.	Freight	459,633	75.52	14,445
8.	Passenger	148,993	24.48	4,683
9.	Michigan Passenger, Line 8		100.00	4,683
10.	Divided relatively with the total of charges to Michigan Passenger Service in Accounts 2 to 17 inclusive (see detail page following)	$149,993		
11.	Sleepers and Diners	55,878	37.50	1,756
12.	Mail and Express	20,629	13.85	649
13.	Passengers and Baggage	72,486	48.65	2,278
14.	Michigan Passengers and Baggage, Line 13		100.00	2,278
15.	Divided on Michigan Passenger miles, Ratio No. 10:			
16.	Interstate		35.31	804
17.	Intrastate		64.69	1,474

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Details for Dividing Accounts Nos. 1, 18, 19, 20, 21, 22 and 23.

Acct. No.	System Total	Outside Michigan	Michigan		D. S. S. & A. Passenger			
			Total	Freight	Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
	$	$	$	$	$	$	$	$
2	20,376	178	20,198	15,066	5,132	2,041	703	2,388
3	117,364	25,744	91,620	68,337	23,283	9,260	3,190	10,833
4	50,034	1,766	48,268	36,001	12,267	4,878	1,681	5,708
5	30,509	3,377	27,132	20,237	6,895	2,742	945	3,208
6	332,089	55,736	276,353	208,052	68,301	26,087	9,453	32,761
7	20,071	1,621	18,450	14,959	3,491	1,025	511	1,955
9	76,702	30,816	45,886	34,636	11,250	3,304	1,646	6,300
10	74		74	74				
11	9,795	1,037	8,758	6,881	1,877	551	275	1,051
12	1,051	30	1,021	802	219	64	32	123
13	442	262	180	171	9	3	1	5
14	3,340	493	2,847	2,193	654	192	96	366
16	62,160	9,539	52,621	37,891	14,730	5,438	1,982	7,310
17	15,218(a)		15,218	14,333	885	293	114	478
TOTAL	739,225	130,599	608,626	459,633	148,993	55,878	20,629	72,486

(a) Excludes $19,146 of Depreciation on Marquette Docks.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 2, Ballast.

		%	$
1.	System Total, per Annual Report, $20,376; allocated to Michigan	100.00	20,198
2.	Divided on Michigan Equated Track miles, Ratio No. 2:		
3.	Freight	16.89	3,412
4.	Common Freight and Passenger	82.91	16,746
5.	Passenger	.20	40
6.	Michigan Common, Line 4	100.00	16,746
7.	Divided on Michigan Total Gross Ton Miles, Ratio No. 1:		
8.	Freight	69.59	11,654
9.	Passenger	30.41	5,092
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		3,412
12.	Common, Line 8		11,654
13.	Total Michigan Freight		15,066
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		40
16.	Common, Line 9		5,092
17.	Total Michigan Passenger		5,132
18.	Michigan Passenger, Line 17	100.00	5,132
19.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1 a:		
20.	Sleepers and Diners	39.77	2,041
21.	Mail and Express	13.70	703
22.	Passengers and Baggage	46.53	2,388
23.	Michigan Passengers and Baggage, Line 22	100.00	2,388
24.	Divided on Michigan Passenger Miles, Ratio No. 10:		
25.	Interstate	35.31	843
26.	Intrastate	64.69	1,545

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 3, Ties.

		%	$
1.	System Total, per Annual Report, $117,364; allocated to Michigan by Delf.	100.00	91,620
2.	Divided on Michigan Equated Track Miles, Ratio No. 2:		
3.	Freight	16.89	15,475
4.	Common Freight and Passenger	82.91	75,962
5.	Passenger	.20	183
6.	Michigan Common, Line 4	100.00	75,962
7	Divided on Michigan Total Gross Ton Miles, Ratio No. 1:		
8.	Freight	69.59	52,862
9.	Passenger	30.41	23,100
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		15,475
12.	Common, Line 8		52,862
13.	Total Michigan Freight		68,337
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		183
16.	Common, Line 9		23,100
17.	Total Michigan Passenger		23,283
18.	Michigan Passenger, Line 17	100.00	23,283
19.	Divided on Mich. Pass. Gross Ton Miles, Ratio No. 1 a:		
20.	Sleepers and Diners	39.77	9,260
21.	Mail and Express	13.70	3,190
22.	Passengers and Baggage	46.53	10,833
23.	Michigan Passengers and Baggage, Line 22	100.00	10,833
24.	Divided on Michigan Passenger Miles, Ratio No. 10:		
25.	Interstate	35.31	3,825
26.	Intrastate	64.69	7,008

WRITING CLOSE

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 4, Rails.

		%	$
1.	System Total, per Annual Report, $50,034; allocated to Michigan by Delf.	100.00	48,268
2.	Divided on Michigan Equated Track Miles, Ratio No. 2:		
3.	Freight	16.89	8,152
4.	Common Freight and Passenger	82.91	40,019
5.	Passenger	.20	97
6.	Michigan Common, Line 4	100.00	40,019
7.	Divided on Michigan Total Gross Ton Miles, Ratio No. 1:		
8.	Freight	69.59	27,849
9.	Passenger	30.41	12,170
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		8,152
12.	Common, Line 8		27,849
13.	Total Michigan Freight		36,001
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		97
16.	Common, Line 9		12,170
17.	Total Michigan Passenger		12,267
18.	Michigan Passenger, Line 17	100.00	12,267
19.	Divided on Mich. Pass. Gross Ton Miles, Ratio No. 1 a:		
20.	Sleepers and Diners	39.77	4,878
21.	Mail and Express	13.70	1,681
22.	Passengers and Baggage	46.53	5,708
23.	Michigan Passengers and Baggage, Line 22	100.00	5,708
24.	Divided on Michigan Passenger Miles, Ratio No. 10:		
25.	Interstate	35.31	2,015
26.	Intrastate	64.69	3,693

TO EDGE

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 5, Other Track Material.

		%	$
1.	System Total, per Annual Report, $30,509; allocated to Michigan by Delf.	100.00	27,132
2.	Divided on Michigan Equated Track Miles, Ratio No. 2:		
3.	Freight	16.89	4,583
4.	Common Freight and Passenger	82.91	22,495
5.	Passenger	.20	54
6.	Michigan Common, Line 4	100.00	22,495
7.	Divided on Michigan Total Gross Ton Miles, Ratio No. 1:		
8.	Freight	69.59	15,654
9.	Passenger	30.41	6,841
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		4,583
12.	Common, Line 8		15,654
13.	Total Michigan Freight		20,237
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		54
16.	Common, Line 9		6,841
17.	Total Michigan Passenger		6,895
18.	Michigan Passenger, Line 17	100.00	6,895
19.	Divided on Mich. Pass. Gross Ton Miles, Ratio No. 1 a:		
20.	Sleepers and Diners	39.77	2,742
21.	Mail and Express	13.70	945
22.	Passengers and Baggage	46.53	3,208
23.	Michigan Passengers and Baggage, Line 22	100.00	3,208
24.	Divided on Michigan Passenger Miles, Ratio No. 10:		
25.	Interstate	35.31	1,133
26.	Intrastate	64.69	2,075

WRITING CLO

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 6, Roadway and Track.

			$
1.	System Total, per Annual Report, $332,089; allocated to Michigan		276,353
2.	Subdivided into Sub-Primary Accounts:		
3.	Group A:		
4.	Applying Ballast	$12,639	
5.	Applying Ties	53,414	
6.	Applying Rails	19,558	
7.	Applying Other Track Material	4,047	
8.	Track Maintenance	131,259	
9.	Track Changes	29	
10.	Train Service	7,070	
11.	Total Group A.		228,016
12.	Group B:		
13.	Care of Roadbed	$ 6,558	
14.	General Cleaning	14,473	
15.	Watching Roadway	22,012	
16.	Track Changes (Filling)	58	
17.	Train Service	4,912	
18.	Bank Protection	289	
19.	Other Expenses	35	
20.	Total Group B.		48,337
		%	
21.	Michigan Total—Group A, Line 11	100.00	228,016
22.	Divided on Michigan Equated Track Miles, Ratio No. 2:		
23.	Freight	16.89	38,512
24.	Common Freight and Passenger	82.91	189,048
25.	Passenger	.20	.456
26.	Michigan Common—Group A, Line 24	100.00	189,048
27.	Divided on Michigan Total Gross Ton Miles, Ratio No. 1:		
28.	Freight	69.59	131,559
29.	Passenger	30.41	57.489

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 6, Roadway and Track (continued).

		%	$
30.	Michigan Freight Recap—Group A:		
31.	Exclusive, Line 23		38,512
32.	Common, Line 28		131,559
33.	Total Michigan Freight—Group A.		170,071
34.	Michigan Passenger Recap—Group A:		
35.	Exclusive, Line 25		456
36.	Common, Line 29		57,489
37.	Total Michigan Passenger—Group A.		57,945
38.	Michigan Passenger—Group A, Line 37	100.00	57,945
39.	Divided on Mich. Pass. Gross Ton Miles, Ratio No. 1 a:		
40.	Sleepers and Diners	39.77	23,045
41.	Mail and Express	13.70	7,938
42.	Passengers and Baggage	46.53	26,962
43.	Michigan Total—Group B, Line 20	100.00	48,337
44.	Divided on Mich. Equated Track Miles, Ratio No. 2:		
45.	Freight	16.89	8,164
46.	Common Freight and Passenger	82.91	40,076
47.	Passenger	.20	97
48.	Michigan Common—Group B, Line 46	100.00	40,076
49.	Divided on Michigan Time, Ratio No. 4:		
50.	Freight	74.40	29,817
51.	Passenger	25.60	10,259
52.	Michigan Freight Recap—Group B:		
53.	Exclusive, Line 45		8,164
54.	Common, Line 50		29,817
55.	Total Michigan Freight—Group B		37,981
56.	Michigan Passenger Recap—Group B:		
57.	Exclusive, Line 47		97
58.	Common, Line 51		10,259
59.	Total Michigan Passenger—Group B.		10,356

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 6, Roadway and Track (continued).

		%	$
60.	Michigan Passenger—Group B, Line 59	100.00	10,356
61.	Div'd on Mich. To'l Pass. Train Car Miles, Ratio No. 3:		
62.	Sleepers and Diners	29.37	3,042
63.	Mail and Express	14.63	1,515
64.	Passengers and Baggage	56.00	5,799
65.	Total Michigan Freight Recap:		
66.	Group A, Line 33		170,071
67.	Group B, Line 55		37,981
68.	Total Michigan Freight		208,052
69.	Total Michigan Passenger Recap:		
70.	Group A, Line 37		57,945
71.	Group B, Line 59		10,356
72.	Total Michigan Passenger		68,301
73.	Michigan Sleepers and Diners Recap:		
74.	Group A, Line 40		23,045
75.	Group B, Line 62		3,042
76.	Total Michigan Sleepers and Diners		26,087
77.	Michigan Mail and Express Recap:		
78.	Group A, Line 41		7,938
79.	Group B, Line 63		1,515
80.	Total Michigan Mail and Express		9,453
81.	Michigan Passengers and Baggage Recap:		
82.	Group A, Line 42		26,962
83.	Group B, Line 64		5,799
84.	Total Michigan Passengers and Baggage		32,761
85.	Michigan Passengers and Baggage, Line 84	100.00	32,761
86.	Divided on Michigan Passenger Miles, Ratio No. 10:		
87.	Interstate	35.31	11,568
88.	Intrastate	64.69	21,193

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 7, Removal of Snow, Sand and Ice.

		%	$
1.	System Total, per Annual Report, $20,071; allocated to Michigan by Delf.	100.00	18,450
2.	Divided to Services by Agreement:		
3.	Freight	29.00	5,350
4.	Common Freight and Passenger	70.00	12,915
5.	Passenger	1.00	185
6.	Michigan Common, Line 4	100.00	12,915
7.	Divided on Michigan Time, Ratio No. 4:		
8.	Freight	74.40	9,609
9.	Passenger	25.60	3,306
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		5,350
12.	Common, Line 8		9,609
13.	Total Michigan Freight		14,959
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		185
16.	Common, Line 9		3,306
17.	Total Michigan Passenger		3,491
18.	Michigan Passenger, Line 17	100.00	3,491
19.	Div'd on Mich. To'l Pass. Train Car Miles, Ratio No. 3:		
20.	Sleepers and Diners	29.37	1,025
21.	Mail and Express	14.63	511
22.	Passengers and Baggage	56.00	1,955
23.	Michigan Passengers and Baggage, Line 22	100.00	1,955
24.	Divided on Mich. Pass. Miles, Ratio No. 10:		
25.	Interstate	35.31	690
26.	Intrastate	64.69	1,265

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 9, Bridges, Trestles and Culverts.

			%	$
1.	System Total, per Annual Report, $76,702; allocated to Michigan			45,886
2.	Divided relatively with 1916 Account	$45,887		
3.	Freight	1,940	4.23	1,941
4.	Common Freight and Passenger	43,947	95.77	43,945
5.	Michigan Common, Line 4		100.00	43,945
6.	Divided on Michigan Time, Ratio No. 4:			
7.	Freight		74.40	32,695
8.	Passenger		25.60	11,250
9.	Michigan Freight Recap:			
10.	Exclusive, Line 3			1,941
11.	Common, Line 7			32,695
12.	Total Michigan Freight			34,636
13.	Michigan Passenger, Line 8		100.00	11,250
14.	Div'd on Mich. To'l Pass. Train Car Miles, Ratio No. 3:			
15.	Sleepers and Diners		29.37	3,304
16.	Mail and Express		14.63	1,646
17.	Passengers and Baggage		56.00	6,300
18.	Michigan Passengers and Baggage, Line 17		100.00	6,300
19.	Divided on Michigan Passenger Miles, Ratio No. 10:			
20.	Interstate		35.31	2,225
21.	Intrastate		64.69	4,075

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 10, Over and Under Grade Crossing.

	$
1. System Total, per Annual Report, $74; allocated to Michigan by Delf. All Freight.	74

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 11, Grade Crossings, Fences, Cattle Guards and Signs.

		%	$
1.	System Total, per Annual Report, $9,795; allocated to Michigan	100.00	8,758
2.	Divided on Michigan Equated Track Miles, No. 2:		
3.	Freight	16.89	1,479
4.	Common Freight and Passenger	82.91	7,261
5.	Passenger	.20	18
6.	Michigan Common, Line 4	100.00	7,261
7.	Divided on Michigan Time, Ratio No. 4:		
8.	Freight	74.40	5,402
9.	Passenger	25.60	1,859
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		1,479
12.	Common, Line 8		5,402
13.	Total Michigan Freight		6,881
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		18
16.	Common, Line 9		1,859
17.	Total Michigan Passenger		1,877
18.	Michigan Passenger, Line 17	100.00	1,877
19.	Div'd on Mich. Total Pass. Train Car Miles, Ratio No. 3:		
20.	Sleepers and Diners	29.37	551
21.	Mail and Express	14.63	275
22.	Passengers and Baggage	56.00	1,051
23.	Michigan Passengers and Baggage, Line 22	100.00	1,051
24.	Divided on Michigan Passenger Miles, Ratio No. 10:		
25.	Interstate	35.31	371
26.	Intrastate	64.69	680

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 12, Snow and Sand Fences and Snowsheds.

		%	$
1.	System Total, per Annual Report, $1,051; allocated to Michigan by Delf.	100.00	1,021
2.	Divided on Michigan Equated Track Miles, Ratio No. 2:		
3.	Freight	16.89	172
4.	Common Freight and Passenger	82.91	847
5.	Passenger	.20	2
6.	Michigan Common, Line 4	100.00	847
7.	Divided on Michigan Time, Ratio No. 4:		
8.	Freight	74.40	630
9.	Passenger	25.60	217
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		172
12.	Common, Line 8		630
13.	Total Michigan Freight		802
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		2
16.	Common, Line 9		217
17.	Total Michigan Passenger		219
18.	Michigan Passenger, Line 17	100.00	219
19.	Div'd on Mich. To'l Pass. Train Car Miles, Ratio No. 3:		
20.	Sleepers and Diners	29.37	64
21.	Mail and Express	14.63	32
22.	Passengers and Baggage	56.00	123
23.	Michigan Passengers and Baggage, Line 22	100.00	123
24.	Divided on Michigan Passenger Miles, Ratio No. 10:		
25.	Interstate	35.31	43
26.	Intrastate	64.69	80

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 13, Signals and Interlocking Plants.

		%	$
1.	System Total, per Annual Report, $442; allocated to Michigan	100.00	180
2.	Divided on same basis as Account No. 90:		
3.	Freight	94.76	171
4.	Passenger	5.24	9
5.	Michigan Passenger, Line 4	100.00	9
6.	Div'd on Mich. To'l Pass. Train Car Miles, Ratio No. 3:		
7.	Sleepers and Diners	29.37	3
8.	Mail and Express	14.63	1
9.	Passengers and Baggage	56.00	5
10.	Michigan Passengers and Baggage, Line 9	100.00	5
11.	Divided on Michigan Passenger Miles, Ratio No. 10:		
12.	Interstate	35.31	1
13.	Intrastate	64.69	3

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 14, Telegraph and Telephone Lines.

			%	$
1.	System Total, per Annual Report		100.00	3,340
2.	Divided on System Time, Ratio No. 4 a:			
3.	Freight		76.61	2,559
4.	Passenger		23.39	781
5.	System Freight, Line 3		100.00	2,559
6.	Divided relatively with the total mileage of Freight Trains (including proportion of Mixed and Special) plus train and yard switching in and outside of Michigan			
7.	Outside Michigan	$1,354,176		
8.	Michigan	193,929	14.32	366
		1,160,247	85.68	2,193
9.	System Passenger, Line 4		100.00	781
10.	Divided relatively with the total mileage of Passenger Trains (including C. & N. W. and C., M. & St. P. operations into Marquette and proportion of Mixed and Special) plus Train and Yard Switching, in and outside of Michigan			
11.	Outside Michigan	$979,367		
12.	Michigan	158,749	16.21	127
		820,618	83.79	654
13.	Michigan Passenger, Line 12		100.00	654
14.	Div'd on Mich. To'l Pass. Train Car Miles, Ratio No. 3:			
15.	Sleepers and Diners		29.37	192
16.	Mail and Express		14.63	96
17.	Passengers and Baggage		56.00	366
18.	Michigan Passengers and Baggage, Line 17		100.00	366
19.	Divided on Michigan Passenger Miles, Ratio No. 10:			
20.	Interstate		35.31	129
21.	Intrastate		64.69	237

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 16, Buildings, Fixtures and Grounds.

(Sheet No. 1)

		$	$
1	System Total, per Annual Report		62,160
2.	Subdivided into Sub-Primary Accounts:		
3.	(a) Shops and Storehouses		1,691
4.	(b) Roundhouses and Turntables:		
5.	Thomaston Roundhouse	30,236	
6.	All Others	2,432	
7.	Total Roundhouses and Turntables		32,668
8.	(c) Station and Office Buildings		8,146
9.	(d) Section, Hand Car and Other Houses		4,327
10.	(e) Coal Sheds and Trestles		5,563
11.	(f) Water Tanks and Pump Houses		6,707
12.	(g) Track Scales		2,504
13.	(h) Fixtures		554
14.	Allocated to Michigan by Location		57,581
15.	(a) Shops and Storehouses		1,269
16.	(b) Roundhouses and Turntables:		
17.	Thomaston Roundhouse	30,236	
18.	All Others	2,147	
19.	To'l Mich. Round'es and Turntables		32,383
20.	(c) Station and Office Buildings:		
21.	Freight	2,419	
22.	Common Freight and Passenger	3,602	
23.	Passenger	688	
24.	To'l Mich. Sta. and Office Bldgs.		6,709
25.	(d) Section Hand Car and Other Houses		3,009
26.	(e) Coal Sheds and Trestles		5,269
27.	(f) Water Tanks and Pump Houses		6,038
28.	(g) Track Scales		2,350
29.	(h) Fixtures		554

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 16, Buildings, Fixtures and Grounds (continued).

(Sheet No. 2)

(a) Shops and Storehouses.

			%	$
1.	System Total, Line 3, Sheet 1		100.00	1,691
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 25, 31, 34, 43 and Sleeper and Diner Repairs (see detail page following Account No. 24)	$316,710		
3.	Outside Michigan	51,146	16.15	273
4.	Michigan	265,564	83.85	1,418
5.	Michigan Total, Line 4		100.00	1,418
6.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 25, 31, 34, 43, and Sleeper and Diner Repairs (see detail page following Account No. 24)	$262,445		
7.	Freight	186,047	70.89	1,005
8.	Passenger	76,398	29.11	413
9.	Michigan Passenger, Line 8		100.00	413
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 25, 31, 34, 43, and Sleeper and Diner Repairs (see detail page following Account No. 24)	$ 76,398		
11.	Sleepers and Diners	21,777	28.51	118
12.	Mail and Express	13,158	17.22	17
13.	Passengers and Baggage	41,463	54.27	224

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 16, Buildings, Fixtures and Grounds (continued).

(Sheet No. 3

(b) Roundhouses and Turntables.

			%	$
1.	System Total, per Annual Report		(a) 100.00	32,66
2.	Divided relatively with the total of charges to Michigan and outside Michigan in Accounts 72 and 81	$66,117		
3.	Outside Michigan	8,890	13.45	4,39
4.	Michigan	57,227	86.55	28,27
5.	Michigan Total, Line 4		100.00	28,27
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 72 and 81	$57,227		
7.	Freight	38,923	68.02	19,23
8.	Passenger	18,304	31.98	9,04
9.	Michigan Passenger, Line 8		100.00	9,04
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 72 and 81	$18,304		
11.	Sleepers and Diners	7,440	40.65	3,67
12.	Mail and Express	2,491	13.61	1,23
13.	Passengers and Baggage	8,373	45.74	4,13

NOTE:—(a) Of this Amount $30,000 is for Renewals at Thomasto

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 16, Buildings, Fixtures and Grounds (continued).

(Sheet No. 4)

(c) Station and Office Buildings.

			%	$
1.	System Total, Line 8, Sheet 1, $8,146; allocated to Michigan			6,709
2.	Allocated to Services:			
3.	Freight			2,419
4.	Common Freight and Passenger			3,602
5.	Passenger			688
6	Michigan Common, Line 4		100.00	3,602
7.	Divided on Station Pay Roll, Ratio No. 17:			
8.	Freight		86.19	3,105
9.	Passenger		13.81	497
10.	Michigan Freight Recap:			
11.	Exclusive, Line 3			2,419
12.	Common, Line 8			3,105
13.	Total Michigan Freight			5,524
14.	Michigan Passenger Recap:			
15.	Exclusive, Line 5			688
16.	Common, Line 9			497
17.	Total Michigan Passenger			1,185
18.	Michigan Passenger, Line 17		100.00	1,185
19.	Divided relatively with the charges to Michigan Passenger Services in Acct. No. 63	$20,356		
20.	Mail and Express	2,036	10.00	119
21.	Passengers and Baggage	18,320	90.00	1,066

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 16, Buildings, Fixtures and Grounds (continued).

(Sheet No. 5)

(d) Section, Hand Car and Other Houses.

		%	$
1.	System Total, Line 9, Sheet 1, $4,327; allocated to Michigan	100.00	3,009
2.	Divided on Mich. Equated Track Miles, Ratio No. 2:		
3.	Freight	16.89	508
4.	Common Freight and Passenger	82.91	2,495
5.	Passenger	.20	6
6.	Michigan Common, Line 4	100.00	2,495
7.	Divided on Mich. Total Gross Ton Miles, Ratio No. 1:		
8.	Freight	69.59	1,736
9.	Passenger	30.41	759
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		508
12.	Common, Line 8		1,736
13.	Total Michigan Freight		2,244
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		6
16.	Common, Line 9		759
17.	Total Michigan Passenger		765
18.	Michigan Passenger, Line 17	100.00	765
19.	Divided on Mich. Pass. Gross Ton Miles, Ratio No. 1 a:		
20.	Sleepers and Diners	39.77	304
21.	Mail and Express	13.70	105
22.	Passengers and Baggage	46.53	356

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 16, Buildings, Fixtures and Grounds (continued).

(Sheet No. 6)

(e) Coal Sheds and Trestles.

			%	$
1.	System Total, per Annual Report		100.00	5,563
2.	Divided relatively with the total of charges to Michigan and Outside of Michigan in Accounts 73 and 82	$346,539		
3.	Outside Michigan	55,456	16.00	890
4.	Michigan	291,083	84.00	4,673
5.	Michigan Total, Line 4		100.00	4,673
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 73 and 82	$286,471		
7.	Freight	198,350	69.24	3,236
8.	Passenger	88,121	30.76	1,437
9.	Michigan D. S. S. & A. Passenger, Line 8		100.00	1,437
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 73 and 82	$ 88,121		
11.	Sleepers and Diners	35,687	40.50	582
12.	Mail and Express	12,105	13.74	197
13.	Passengers and Baggage	40,329	45.76	658

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 16, Buildings, Fixtures and Grounds (continued).

(Sheet No. 7)

(f) Water Tanks and Pump Houses.

			%	$
1.	System Total, per Annual Report		100.00	6,707
2.	Divided relatively with the total of charges to Michigan and Outside Michigan in Accounts 73 and 82	$346,539		
3.	Outside Michigan	55,456	16.00	1,073
4.	Michigan	291,083	84.00	5,634
5.	Michigan Total, Line 4		100.00	5,634
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 73 and 82	$286,471		
7.	Freight	198,350	69.24	3,901
8.	Passenger	88,121	30.76	1,733
9.	Michigan D. S. S. & A. Passenger, Line 8		100.00	1,733
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 73 and 82	$ 88,121		
11.	Sleepers and Diners	35,687	40.50	702
12.	Mail and Express	12,105	13.74	238
13.	Passengers and Baggage	40,329	45.76	793

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 16, Buildings, Fixtures and Grounds (continued).

(Sheet No. 8)

(g) Track Scales.

1. System Total, Line 12, Sheet 1, $2,504; allocated to Michigan			$
All Freight.			$2,350

(h) Fixtures.

		%	$
1. System Total, Line 13, Sheet 1, $554; allocated to Michigan		100.00	554
2. Divided relatively with the total of charges to Michigan Freight and Passenger in the other seven Sub-Primary Accounts	$52,067		
3. Freight	37,492	72.01	399
4. Passenger	14,575	27.99	155
5. Michigan Passenger, Line 4		100.00	155
6. Divided relatively with the total of charges to Michigan Passenger Services in the other seven Sub-Primary Accounts	$14,575		
7. Sleepers and Diners	5,381	36.92	57
8. Mail and Express	1,961	13.45	21
9. Passengers and Baggage	7,233	49.63	77

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 16, Buildings, Fixtures and Grounds (continued).

(Sheet No. 9)

Michigan Recap.

Sub-Account	Total	Freight	—D. S. S. & A. Passenger— Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
	$	$	$	$	$	$
(a) Shops and Storehouses	1,418	1,005	413	118	71	224
(b) Round'es and Turn'les	28,274	19,232	9,042	3,675	1,231	4,136
(c) Sta. and Office Bldgs.	6,709	5,524	1,185		119	1,066
(d) Sec. Hd. Car and Other Houses	3,009	2,244	765	304	105	356
(e) Coal Sh's and Trestles	4,673	3,236	1,437	582	197	658
(f) Water Tanks and Pump Houses	5,634	3,901	1,733	702	238	793
(g) Track Scales	2,350	2,350				
(h) Fixtures	554	399	155	57	21	77
TOTAL	52,621	37,891	14,730	5,438	1,982	7,310

	%	$
1. Michigan Passengers and Baggage	100.00	7,310
2. Divided on Michigan Passenger Miles, Ratio No. 10:		
3. Interstate	35.31	2,581
4. Intrastate	64.69	4,729

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 17, Docks and Wharves.

		%	$
1.	System Total, per Annual Report, $34,364; allocated to Michigan by Delf.		34,364
2.	Allocated to Docks by us:		
3.	Marquette Docks (all Freight)		26,577
4.	St. Ignace Merchandise Docks (all Freight)		3,848
5.	St. Ignace Slip Dock		3,939
6.	St. Ignace Slip Dock, Line 5	100.00	3,939
7.	Divided on basis arrived at by Delf. (a):		
8.	Freight	77.54	3,054
9.	Passenger	22.46	885
10.	Michigan Freight Recap:		
11.	Marquette Docks, Line 3 (b)		26,577
12.	St. Ignace Merchandise Dock, Line 4		3,848
13.	St. Ignace Slip Dock, Line 8		3,054
14.	Total Michigan Freight		33,479
15.	Michigan Passenger, Line 9	100.00	885
16.	Divided on basis of Passenger Cars over St. Ignace Slip Dock:		
17.	Sleepers and Diners	33.09	293
18.	Mail and Express	12.93	114
19.	Passengers and Baggage	53.98	478
20.	Michigan Passengers and Baggage, Line 19	100.00	478
21.	Divided on Michigan Passenger Miles, Ratio No. 10:		
22.	Interstate	35.31	169
23.	Intrastate	64.69	309

NOTE:—(a):

	Cars over Slip Dock.		
Class	Total	Equated	Per Cent
Freight	50,782	50,782	77.54
Passenger	7,354 x 2	14,708	22.46
		65,490	100.00

NOTE:—(b) Of this amount $19,146 is for depreciation.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 18, Roadway Tools and Supplies.

		%	$
1. System Total, per Annual Report		100.00	9,526
2. Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 2 to 17 inclusive (see detail page following Account No. 1)	$739,225		
3. Outside Michigan	130,599	17.67	1,683
4. Michigan	608,626	82.33	7,843
5. Michigan Total, Line 4		100.00	7,843
6. Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 2 to 17 inclusive (see detail page following Account No. 1)	$608,626		
7. Freight	459,633	75.52	5,923
8. Passenger	148,993	24.48	1,920
9. Michigan Passenger, Line 8		100.00	1,920
10. Divided relatively with the total of charges to Michigan Passenger Services in Accounts 2 to 17 inclusive (see detail page following Account No. 1)	$148,993		
11. Sleepers and Diners	55,878	37.50	720
12. Mail and Express	20,629	13.85	266
13. Passengers and Baggage	72,486	48.65	934
14. Michigan Passengers and Baggage, Line 13		100.00	934
15. Divided on Mich. Pass. miles, Ratio No. 10			
16. Interstate		35.31	330
17. Intrastate		64.69	604

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 19, Injuries to Persons.

			%	$
1.	System Total, per Annual Report, $3,530; allocated to Michigan			2,734
2.	Allocated to Services:			
3.	Freight			25
4.	Common Freight and Passenger			2,707
5.	Passenger			2
6.	Michigan Common, Line 4		100.00	2,707
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 2 to 17 inclusive (see detail page following Account No. 1)	$608,626		
8.	Freight	459,633	75.52	2,044
9.	Passenger	148,993	24.48	663
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			25
12.	Common, Line 8			2,044
13.	Total Michigan Freight			2,069
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			2
16.	Common, Line 9			663
17.	Total Michigan Passenger			665
18.	Michigan Passenger, Line 17		100.00	665
19.	Divided relatively with the total of charges to Michigan Passenger Service in Accounts 2 to 17 inclusive (see detail page following Account No. 1)	$148,993		
20.	Sleepers and Diners	55,878	37.50	249
21.	Mail and Express	20,629	13.85	92
22.	Passengers and Baggage	72,486	48.65	324
23.	Michigan Passengers and Baggage, Line 22		100.00	324
24.	Divided on Mich. Pass. Miles, Ratio No. 10			
25.	Interstate		35.31	114
26.	Intrastate		64.69	210

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 20, Stationery and Printing.

			%	$
1.	System Total, per Annual Report		100.00	853
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 2 to 17 inclusive (see detail page following Account No. 1)	$739,225		
3.	Outside Michigan	130,599	17.67	151
4.	Michigan	608,626	82.33	702
5.	Michigan Total, Line 4		100.00	702
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 2 to 17 inclusive (see detail page following Account No. 1)	$608,626		
7.	Freight	459,633	75.52	530
8.	Passenger	148,993	24.48	172
9.	Michigan Passenger, Line 8		100.00	172
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 2 to 17 inclusive (see detail page following Accounts No. 1)	$148,993		
11.	Sleepers and Diners	55,878	37.50	64
12.	Mail and Express	20,629	13.85	24
13.	Passengers and Baggage	72,486	48.65	84
14.	Michigan Passengers and Baggage, Line 13		100.00	84
15.	Divided on Mich. Pass. miles, Ratio No. 10			
16.	Interstate		35.31	30
17.	Intrastate		64.69	54

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 21, Other Expenses

			%	$
1.	System Total, per Annual Report		100.00	167
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 2 to 17 inclusive (see detail page following Account No. 1)	$739,225		
3.	Outside Michigan	130,599	17.67	30
4.	Michigan	608,626	82.33	137
5.	Michigan Total, Line 4		100.00	137
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 2 to 17 inclusive (see detail page following Account No. 1)	$608,626		
7.	Freight	459,633	75.52	103
8.	Passenger	148,993	24.48	34
9.	Michigan Passenger, Line 8		100.00	34
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 2 to 17 inclusive (see detail page following Account No. 1)	$148,993		
11.	Sleepers and Diners	55,878	37.50	13
12.	Mail and Express	20,629	13.85	5
13.	Passengers and Baggage	72,486	48.65	16
14.	Michigan Passengers and Baggage, Line 13		100.00	16
15.	Divided on Mich. Pass. miles, Ratio No. 10			
16.	Interstate		35.31	6
17.	Intrastate		64.69	10

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 22, Maintaining Joint Tracks, Yards and Other Facilities—Dr.

			%	$
1.	System Total, per Annual Report, $9,462; allocated to Michigan by Delf			8,138
2.	Allocated to Services			
3.	Freight			7,272
4.	Common Freight and Passenger			36
5.	Passenger			830
6.	Michigan Common, Line 4		100.00	36
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 2 to 17 inclusive (see detail page following Account No. 1)	$608,626		
8.	Freight	459,633	75.52	27
9.	Passenger	148,993	24.48	9
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			7,272
12.	Common, Line 8			27
13.	Total Michigan Freight			7,299
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			830
16.	Common, Line 9			9
17.	Total Michigan Passenger			839
18.	Michigan Passenger, Line 17			839
19.	Allocated to Interstate Passengers and Baggage Account of Soo Bridge			23
20.	Balance			816

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 22, Maintaining Joint Tracks, Yards and Other Facilities—Dr.
(Continued)

21.	Mich. Pass. other than Soo Bridge, Line 20		100.00	816
22.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 2 to 17 inclusive (see detail page following Account No. 1)	$148,993		
23.	Sleepers and Diners	55,878	37.50	306
24.	Mail and Express	20,629	13.85	113
25.	Passengers and Baggage	72,486	48.65	397
26.	Michigan Passengers and Baggage, other than Soo Bridge, Line 25		100.00	397
27.	Divided on Mich. Pass. miles, Ratio No. 10			
28.	Interstate		35.31	140
29.	Intrastate		64.69	257
30.	Mich. Interstate Passengers and Baggage Recap.:			
31.	Soo Bridge, Line 19			23
32.	Other, Line 28			140
33.	Total Mich. Interstate Pass. and Baggage			163

NOTE:—The Common property of this charge is made up of the following:

Depot, Munising Junction	$ 4.18
Crossings, Ishpeming	31.56
Total Common	$35.74

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 23, Maintaining Joint Tracks, Yards and Other Facilities—Cr.

1.	System Total, per annual Report, $10,156;* allocated to Michigan by Delf		%	$ 10,156*
2.	Allocated to Services (see following page)			
3.	Freight			3,274*
4.	Common Freight and Passenger			4,306*
5.	Passenger			2,576*
6.	Michigan Common, Line 4		100.00	4,306*
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 2 to 17 inclusive (see detail page following Account No. 1)	$608,626		
8.	Freight	459,633	75.52	3,252*
9.	Passenger	148,993	24.48	1,054*
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			3,274*
12.	Common, Line 8			3,252*
13.	Total Michigan Freight			6,526*
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			2,576*
16.	Common, Line 9			1,054*
17.	Total Michigan Passenger			3,630*
18.	Michigan Passenger, Line 17		100.00	3,630*
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 2 to 17 inclusive (see detail page following Account No. 1)	$148,993		
20.	Sleepers and Diners	55,878	37.50	1,361*
21.	Mail and Express	20,629	13.85	503*
22.	Passengers and Baggage	72,486	48.65	1,766*
23.	Michigan Passengers and Baggage, Line 22		100.00	1,766*
24.	Divided on Mich. Pass. miles, Ratio No. 10			
25.	Interstate		35.31	624*
26.	Intrastate		64.69	1,142*

*NOTE:—Typewritten in red

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Details of Account No. 23.
Maintining Joint Tracks, Yards and Other Facilities—Cr.

	Total	Freight	Common	Passenger
	$	$	$	$
Negaunee Passenger Station	51.05			51.05
C. & N. W. Passenger Trains to Calumet and Marquette	2,525.33			2,525.33
Various Mine Tracks	2,821.09	2,821.09		
Sidnaw Tracks	45.61	45.61		
Hocking Dock	3.75	3.75		
Prison Tracks	187.01	187.01		
Soo and Other Freight Transfers	173.01	173.01		
Soo Scales	43.30	43.30		
Negaunee—C. & N. W. Pass. Trains	360.00		360.00	
Depots: Keweenaw Bay, Sidnaw, etc.	56.25		56.25	
Mineral Range Freights, Pilgrim to Houghton	303.82		303.82	
Sault St. Marie—				
Outside Union Depot	3,260.12		3,260.12	
Power Canal Bridge	229.48		229.48	
Roundhouses	55.07		55.07	
Coal and Water Plants	19.64		19.64	
Culverts	21.77		21.77	
TOTALS	10,156.30	3,273.77	4,306.15	2,576.38

II. MAINTENANCE OF EQUIPMENT

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

II. MAINTENANCE OF EQUIPMENT.
No. 24, Superintendence.

			%	$
1.	System Total, per Annual Report		100.00	12,662
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 25, 31, 34, 43 and Sleeper and Diner Repairs (see detail page following)	$316,710		
3.	Outside Michigan	51,146	16.15	2,045
4.	Michigan	265,564	83.85	10,617
5.	Michigan Total, Line 4		100.00	10,617
6.	Divided relatively with the total of charges to Michigan Freight and Passenger (M. R. and D. S. S. & A.) in Accounts 25, 31, 34, 43 and Sleeper and Diner Repairs (see detail page following)	$265,564		
7.	Freight	186,047	70.06	7,438
8.	Passenger—M. R.	3,119	1.17	124
9.	Passenger—D. S. S. & A.	76,398	28.77	3,055
10.	Michigan D. S. S. & A. Passenger, Line 9		100.00	3,055
11.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 25, 31, 34, 43 and Sleeper and Diner Repairs (see detail page following)	$ 76,398		
12.	Sleepers and Diners	21,777	28.51	871
13.	Mail and Express	13,158	17.22	526
14.	Passengers and Baggage	41,463	54.27	1,658
15.	Michigan Passengers and Baggage, Line 14		100.00	1,658
16.	Divided on Mich. Pass. miles, Ratio No. 10			
17.	Interstate		35.31	585
18.	Intrastate		64.69	1,073

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Details for Dividing Accounts Nos. 16 a, 24, 46, 48, 49 and 50.

	MICHIGAN								
						D. S. S. & A. Passenger			
Account No.	System Total	Outside Michigan	Total	Freight	Mineral Range Passenger	Total	Sleepers & Diners	Mail & Express	Passengers & Bag'ge
	$	$	$	$	$	$	$	$	$
25	113,758	18,120	95,638	60,658	1,173	33,807	13,658	4,646	15,503
31	41,855	6,772	35,083		1,946	33,137		8,215	24,922
34	141,008	22,336	118,672	118,672					
43	10,784	1,928	8,856	6,717		2,139	804	297	1,038
Sleeper Rep'rs	5,455	1,267	4,188 (a)			4,188	4,188		
Diner Repairs	3,850	723	3,127 (b)			3,127	3,127		
TOTAL	316,710	51,146	265,564	186,047	3,119	76,398	21,777	13,158	41,463

NOTES:—(a) Michigan portion arrived at on basis of Delf's assignment of total Sleeper Expenses to Michigan (76.78%).

(b) Michigan portion arrived at on basis of Delf's assignment of total Diner Expenses to Michigan (81.22%).

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 25, Steam Locomotives—Repairs.

			%	$
1.	System Total, per Annual Report			113,758
2.	Divided to Services (Hillman data)			
3.	Mineral Range Passenger (all Michigan)			1,173
4.	Regular Freight			63,847
5.	Mixed (all Michigan)			496
6.	Special			84
7.	Yard Switching (all Michigan)			8,055
8.	Passenger Train Switching (all Michigan)			94
9.	Regular Passenger			40,009
10.	System Regular Freight, Line 4		100.00	63,847
11.	Divided relatively with the Total Mileage of Regular Freight Train Locomotives in and outside of Michigan	1,191,526		
12.	Outside Michigan	213,119	17.89	11,422
13.	Michigan	978,407	82.11	52,425
14.	Michigan Mixed, Line 5		100.00	496
15.	Divided relatively with the Average Number of Freight and Passenger Cars in Mixed Trains in 1915-1916:			
16.	Freight		82.33	408
17.	Passenger		17.67	88
18.	System Special, Line 6		100.00	84
19.	Divided relatively with the Total Mileage of Special Train Locomotives in and outside of Michigan	1,681		
20.	Outside Michigan	322	19.15	16
21.	Michigan	1,359	80.85	68
22.	Michigan Special, Line 21		100.00	68
23.	Divided relatively with the Michigan Mileage of Special Train Locomotives in Mixed and Passenger Services	1,359		
24.	Mixed	638	46.94	32
25.	Passenger	721	53.06	36

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 25, Steam Locomotives—Repairs—(Continued).

			%	$
26.	Michigan Special Mixed, Line 24		100.00	32
27.	Divided relatively with the Average Number of Freight and Passenger Cars in Mixed Trains in 1915-1916:			
28.	Freight		82.33	26
29.	Passenger		17.67	6
30.	Michigan Special Passenger Recap.:			
31.	Exclusive, Line 25			36
32.	Mixed, Line 29			6
33.	Total Michigan Special Passenger			42
34.	Michigan Yard Switching, Line 7		100.00	8,055
35.	Divided on Michigan Total Yard Switching miles, Ratio No. 13 a			
36.	Freight		96.82	7,799
37.	Passenger		3.18	256
38.	System Regular Passenger, Line 9		100.00	40,009
39.	Divided relatively with the Revenue Mileage of Regular D. S. S. & A. Passenger Train Locomotives in and outside of Michigan	963,708		
40.	Outside Michigan	160,971	16.70	6,682
41.	Michigan	802,737	83.30	33,327
42.	Michigan Passenger Switching Recap.:			
43.	Train, Line 8			94
44.	Yard, Line 37			256
45.	Total Michigan Passenger Switching			350
46.	Michigan Revenue Passenger Recap.:			
47.	Mixed, Line 17			88
48.	Special, Line 33			42
49.	Regular, Line 41			33,327
50.	Total Michigan Revenue Passenger			33,457

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 25, Steam Locomotives—Repairs—(Continued).

		%	$
51.	Michigan Passenger Switching, Line 45	100.00	350
52.	Divided on Michigan Total Passenger Switching Miles, Ratio No. 13 c:		
53.	Sleepers and Diners	39.56	138
54.	Mail and Express	7.47	26
55.	Passengers and Baggage	52.97	186
56.	Michigan Revenue Passenger, Line 50	100.00	33,457
57.	Divided on Mich. Pass. Gross Ton Miles, Ratio No. 1 b:		
58.	Sleepers and Diners	40.41	13,520
59.	Mail and Express	13.81	4,620
60.	Passengers and Baggage	45.78	15,317
61.	Michigan Freight Recap.:		
62.	Regular, Line 13		52,425
63.	Mixed, Line 16		408
64.	Special, Line 28		26
65.	Yard Switching, Line 36		7,799
66.	Total Michigan Freight		60,658
67.	Michigan Passenger Recap.:		
68.	Switching, Line 45		350
69.	Revenue, Line 50		33,457
70.	Total Michigan Passenger		33,807
71.	Michigan Sleepers and Diners Recap.:		
72.	Switching, Line 53		138
73.	Revenue, Line 58		13,520
74.	Total Michigan Sleepers and Diners		13,658
75.	Michigan Mail and Express Recap.:		
76.	Switching, Line 54		26
77.	Revenue, Line 59		4,620
78.	Total Michigan Mail and Express		4,646
79.	Michigan Passengers and Baggage Recap.:		
80.	Switching, Line 55		186
81.	Revenue, Line 60		15,317
82.	Total Michigan Passengers and Baggage		15,503
83.	Michigan Passengers and Baggage, Line 82	100.00	15,503
84.	Divided on Michigan Passenger Miles, Ratio No. 10:		
85.	Interstate	35.31	5,474
86.	Intrastate	64.69	10,029

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 26, Steam Locomotives—Renewals.

		%	$
1.	System Total, per Annual Report, $206;* allocated to Michigan		151*
2.	Allocated to Services:		
3.	Regular Freight		242*
4.	Regular Passenger		10*
5.	Yard Switching		101
6.	Michigan Yard Switching, Line 5	100.00	101
7.	Divided on Michigan Total Yard Switching Miles, Ratio No. 13 a:		
8.	Freight	96.82	98
9.	Passenger	3.18	3
10.	Michigan Freight Recap.:		
11.	Regular, Line 3		242*
12.	Yard Switching, Line 8		98
13.	Total Michigan Freight		144*
14.	Michigan Passenger Recap.:		
15.	Regular, Line 4		10*
16.	Yard Switching, Line 9		3
17.	Total Michigan Passenger		7*
18.	Michigan Passenger, Line 17	100.00	7*
19.	Divided on Michigan Passenger Yard Switching Miles, Ratio No. 13 b:		
20.	Sleepers and Diners	51.01	4*
21.	Mail and Express	4.80	0*
22.	Passengers and Baggage	44.19	3*
23.	Michigan Passengers and Baggage, Line 22	100.00	3*
24.	Divided on Michigan Passenger Miles, Ratio No. 10:		
25.	Interstate	35.31	1*
26.	Intrastate	64.69	2*

*NOTE:—Typewritten in red.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 27, Steam Locomotives—Depreciation.

			%	$
1.	System Total, per Annual Report			24,560
2.	Divided to Services (Hillman data):			
3.	Mineral Range Passenger (all Michigan)			421
4.	Regular Freight			14,132
5.	Mixed (all Michigan)			129
6.	Special			32
7.	Yard Switching (all Michigan)			2,908
8.	Passenger Train Switching (all Michigan)			14
9.	Regular Passenger			6,924
10.	System Regular, Freight, Line 4		100.00	14,132
11.	Divided relatively with the total Mileage of Regular Freight Train Locomotives in and outside of Michigan	1,191,526		
12.	Outside Michigan	213,119	17.89	2,528
13	Michigan	978,407	82.11	11,604
14.	Michigan Mixed, Line 5		100.00	129
15.	Divided relatively with the average number of Freight and Passenger Cars in Mixed Trains in 1915-1916:			
16.	Freight		82.33	106
17.	Passenger		17.67	23
18.	System Special, Line 6		100.00	32
19.	Divided relatively with the Total Mileage of Special Train Locomotives in and outside of Michigan	1,681		
20.	Outside Michigan	322	19.15	6
21.	Michigan	1,359	80.85	26
22.	Michigan Special, Line 21		100.00	26
23.	Divided relatively with the Michigan Mileage of Special Train Locomotives in Mixed and Passenger Services	1,359		
24.	Mixed	638	46.94	12
25.	Passenger	721	53.06	14

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 27, Steam Locomotive—Depreciation—(Continued).

			%	$
26.	Michigan Special Mixed, Line 24		100.00	12
27.	Divided relatively with the average number of Freight and Passenger Cars in Mixed Trains in 1915-1916:			
28.	Freight		82.33	10
29.	Passenger		17.67	2
30.	Michigan Special Passenger Recap.:			
31.	Exclusive, Line 25			14
32.	Mixed, Line 29			2
33.	Total Michigan Special Passenger			16
34.	Michigan Yard Switching, Line 7		100.00	2,908
35.	Divided on Michigan Total Yard Switching Miles, Ratio No. 13 a:			
36.	Freight		96.82	2,816
37.	Passenger		3.18	92
38.	System Regular Passenger, Line 9		100.00	6,924
39.	Divided relatively with the Revenue Mileage of Regular D. S. S. & A. Passenger Train Locomotives in and outside of Michigan	963,708		
40.	Outside Michigan	160,971	16.70	1,156
41.	Michigan	802,737	83.30	5,768
42.	Michigan Passenger Switching Recap.:			
43.	Train, Line 8			14
44.	Yard, Line 37			92
45.	Total Michigan Passenger Switching			106
46.	Michigan Revenue Passenger Recap.:			
47.	Mixed, Line 17			23
48.	Special, Line 33			16
49.	Regular, Line 41			5,768
50.	Total Michigan Revenue Passenger			5,807
51.	Michigan Passenger Switching, Line 45		100.00	106
52.	Divided on Michigan Total Passenger Switching Miles, Ratio No. 13 c:			
53.	Sleepers and Diners		39.56	42
54.	Mail and Express		7.47	8
55.	Passengers and Baggage		52.97	56

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 27, Steam Locomotives—Depreciation—(Continued).

		%	$
56.	Michigan Revenue Passenger, Line 50	100.00	5,807
57.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1 b:		
58.	Sleepers and Diners	40.41	2,347
59.	Mail and Express	13.81	802
60.	Passengers and Baggage	45.78	2,658
61.	Michigan Freight Recap.:		
62.	Regular, Line 13		11,604
63.	Mixed, Line 16		106
64.	Special, Line 28		10
65.	Yard Switching, Line 36		2,816
66.	Total Michigan Freight		14,536
67.	Michigan Passenger Recap.:		
68.	Switching, Line 45		106
69.	Revenue, Line 50		5,807
70.	Total Michigan Passenger		5,913
71.	Michigan Sleepers and Diners Recap.:		
72.	Switching, Line 53		42
73.	Revenue, Line 58		2,347
74.	Total Michigan Sleepers and Diners		2,389
75.	Michigan Mail and Express Recap.:		
76.	Switching, Line 54		8
77.	Revenue, Line 59		802
78.	Total Michigan Mail and Express		810
79.	Michigan Passengers and Baggage Recap.:		
80.	Switching, Line 55		56
81.	Revenue, Line 60		2,658
82.	Total Michigan Passengers and Baggage		2,714
83.	Michigan Passengers and Baggage, Line 82	100.00	2,714
84.	Divided on Michigan Passenger Miles, Ratio No. 10:		
85.	Interstate	35.31	958
86.	Intrastate	64.69	1,756

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 31, Passenger Train Cars—Repairs.
No. 33, Passenger Train Cars—Depreciation.

		%	No. 31 $	No. 33 $
1.	System Total, per An. Rep. (all Pass.)	100.00	41,855	7,199
2.	Divided on Total D. S. S. & A. Passenger Car Miles, Ratio No. 3 c:			
3.	Outside Michigan	16.18	6,772	1,165
4.	Michigan—Mineral Range	4.65	1,946	335
5.	Michigan—D. S. S. & A.	79.17	33,137	5,699
6.	Michigan D. S. S. & A. Passenger, Line 5	100.00	33,137	5,699
7.	Divided on Michigan D. S. S. & A. Passenger Car Miles, Ratio No. 3 d:			
8.	Mail and Express	24.79	8.215	1,413
9.	Passengers and Baggage	75.21	24,922	4,286
10.	Michigan Passengers and Baggage, Line 9	100.00	24,922	4,286
11.	Divided on Mich. Pass. Miles, Ratio No. 10:			
12.	Interstate	35.31	8,800	1,513
13.	Intrastate	64.69	16,122	2,773

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 34, Freight Train Cars—Repairs.
No. 35, Freight Train Cars—Renewals.
No. 36, Freight Train Cars—Depreciation.

	No. 34	No. 35	No. 36
	$	$	$
1. System Totals, per Annual Report	141,008	698	65,205
2. Assigned to Michigan by Delf. All Freight	118,672	588	54,876

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 43, Work Equipment—Repairs.
No. 45, Work Equipment—Depreciation.

				No. 43	No. 45
			%	$	$
1.	System Total, per Annual Report		100.00	10,784	3,469
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 2 to 14 inclusive and 17 (see detail page following)	$677,065			
3.	Outside Michigan	121,060	17.88	1,928	620
4.	Michigan	556,005	82.12	8,856	2,849
5.	Michigan Total, Line 4		100.00	8,856	2,849
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 2 to 14 inclusive and 17 (see detail page following)	$556,005			
7.	Freight	421,742	75.85	6,717	2,161
8.	Passenger	134,263	24.15	2,139	688
9.	Michigan Passenger, Line 8		100.00	2,139	688
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 2 to 14 inclusive, and 17 (see detail page following)	$134,263			
11.	Sleepers and Diners	50,440	37.57	804	258
12.	Mail and Express	18,647	13.89	297	96
13.	Passengers and Baggage	65,176	48.54	1,038	334
14.	Michigan Passengers and Baggage, Line 13		100.00	1,038	334
15.	Divided on Michigan Passenger Miles, Ratio No. 10:				
16.	Interstate		35.31	367	118
17.	Intrastate		24.63	671	216

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Details for Dividing Accounts Nos. 43 and 45.

Acct. No.	System Total	Outside Michigan	MICHIGAN Total	Freight	—Passenger— Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
	$	$	$	$	$	$	$	$
2.	20,376	178	20,198	15,066	5,132	2,041	703	2,388
3.	117,364	25,744	91,620	68,337	23,283	9,260	3,190	10,833
4.	50,034	1,766	48,268	36,001	12,267	4,878	1,681	5,708
5.	30,509	3,377	27,132	20,237	6,895	2,742	945	3,208
6.	332,089	55,736	276,353	208,052	68,301	26,087	9,453	32,761
7.	20,071	1,621	18,450	14,959	3,491	1,025	511	1,955
9.	76,702	30,816	45,886	34,636	11,250	3,304	1,646	6,300
10.	74		74	74				
11.	9,795	1,037	8,758	6,881	1,877	551	275	1,051
12.	1,051	30	1,021	802	219	64	32	123
13.	442	262	180	171	9	3	1	5
14.	3,340	493	2,847	2,193	654	192	96	366
17. (a)	15,218		15,218	14,333	885	293	114	478
TOTAL	677,065	121,060	556,005	421,742	134,263	50,440	18,647	65,176

NOTE:—(a) Excludes $19,146 of Depreciation on Marquette Docks.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 46, Shop Machinery and Tools.

			%	$
1.	System Total, per Annual Report		100.00	7,071
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 25, 31, 34, 43 and Sleeper and Diner Repairs (see detail page following Account No. 24)	$316,710		
3.	Outside Michigan	51,146	16.15	1,142
4.	Michigan	265,564	83.85	5,929
5.	Michigan Total, Line 4		100.00	5,929
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 25, 31, 34, 43 and Sleeper and Diner Repairs (see detail page following Account No. 24)	$262,445		
7.	Freight	186,047	70.89	4,203
8.	Passenger	76,398	29.11	1,726
9.	Michigan Passenger, Line 8		100.00	1,726
0.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 25, 31, 34, 43 and Sleeper and Diner Repairs (see detail page following Account No. 24)	$ 76,398		
1.	Sleepers and Diners	21,777	28.51	492
2.	Mail and Express	13,158	17.22	297
3.	Passengers and Baggage	41,463	54.27	937
4.	Michigan Passengers and Baggage, Line 13		100.00	937
5.	Divided on Michigan Passenger Miles, Ratio No. 10:			
6.	Interstate		35.31	331
7.	Intrastate		64.69	606

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 48, Injuries to Persons.

			%	$
1.	System Total, per Annual Report, $966; allocated to Michigan			881
2.	Allocated to Services:			
3.	Freight			304
4.	Common Freight and Passenger			577
5.	Michigan Common, Line 4		100.00	577
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 25, 31, 34, 43 and Sleeper and Diner Repairs (see detail page following Account No. 24	$262,445		
7.	Freight	186,047	70.89	409
8.	Passenger	76,398	29.11	168
9.	Michigan Freight Recap.:			
10.	Exclusive, Line 3			304
11.	Common, Line 7			409
12.	Total Michigan Freight			713
13.	Michigan Passenger, Line 8		100.00	168
14.	Divided relatively with the total of charges to Michigan Passenger Service in Accounts 25, 31, 34, 43 and Sleeper and Diner Repairs (see detail page following Account No. 24	$ 76,398		
15.	Sleepers and Diners	21,777	28.51	48
16.	Mail and Express	13,158	17.22	29
17.	Passengers and Baggage	41,463	54.27	91
18.	Michiagn Passengers and Baggage, Line 17		100.00	91
19.	Divided on Michigan Passenger Miles, Ratio No. 10:			
20.	Interstate		35.31	32
21.	Intrastate		64.69	59

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 49, Stationery and Printing.

			%	$
1.	System Total, per Annual Report		100.00	1,303
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 25, 31, 34, 43 and Sleeper and Diner Repairs (see detail page following Account No. 24)	$316,710		
3.	Outside Michigan	51,146	16.15	210
4.	Michigan	265,564	83.85	1,093
5.	Michigan Total, Line 4		100.00	1,093
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 25, 31, 34, 43 and Sleeper and Diner Repairs (see detail page following Account No. 24)	$262,445		
7.	Freight	186,047	70.89	775
8.	Passenger	76,398	29.11	318
9.	Michigan Passenger, Line 8		100.00	318
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 25, 31, 34, 43 and Sleeper and Diner Repairs (see detail page following Account No. 24)	$ 76,398		
11.	Sleepers and Diners	21,777	28.51	91
12.	Mail and Express	13,158	17.22	55
13.	Passengers and Baggage	41,463	54.27	172
14.	Michigan Passengers and Baggage, Line 13		100.00	172
15.	Divided on Michigan Passenger miles, Ratio No. 10:			
16.	Interstate		35.31	61
17.	Intrastate		64.69	111

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 50, Other Expenses.

			%	$
1.	System Total, per Annual Report		100.00	25
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 25, 31, 34, 43 and Sleeper and Diner Repairs (see detail page following Account No. 24)	$316,710		
3.	Outside Michigan	51,146	16.15	4
4.	Michigan	265,564	83.85	21
5.	Michigan Total, Line 4		100.00	21
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 25, 31, 34, 43 and Sleeper and Diner Repairs (see detail page following Account No. 24)	$262,445		
7.	Freight	186,047	70.89	15
8.	Passenger	76,398	29.11	6
9.	Michigan Passenger, Line 8		100.00	6
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 25, 31, 34, 43 and Sleeper and Diner Repairs (see detail page following Account No. 24)	$ 76,398		
11.	Sleepers and Diners	21,777	28.51	2
12.	Mail and Express	13,158	17.22	1
13.	Passengers and Baggage	41,463	54.27	3
14.	Michigan Passengers and Baggage, Line 13		100.00	3
15.	Divided on Michigan Passenger Miles, Ratio No. 10:			
16.	Interstate		35.31	1
17.	Intrastate		64.69	2

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 51, Maintaining Joint Equipment at Terminals—Dr.

			%	$
1.	System Total per Annual Report, $803; allocated to Michigan by Delf.			35
2.	Allocated to Services by Delf:			
3.	Freight			19
4.	Passenger			16
5.	Michigan Passenger, Line 4		100.00	16
6.	Divided relatively with the charges to Michigan Passenger Services in Account No. 43	$2,139		
7.	Sleepers and Diners	804	37.59	6
8.	Mail and Express	297	13.88	2
9.	Passengers and Baggage	1,038	48.53	8
10.	Michigan Passengers and Baggage, Line 9		100.00	8
11.	Divided on Michigan Passenger miles, Ratio No. 10:			
12.	Interstate		35.31	3
13.	Intrastate		64.69	5

NOTE:—The Michigan portion of this charge is for Work Equipment at Sault Ste. Marie.

III. TRAFFIC

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

III. TRAFFIC.

No. 53, Superintendence.

		%	$
1.	System Total per Annual Report.		31,901
2.	Allocated Services by Delf:		
3.	Freight		17,629
4.	Passenger (all Passengers and Baggage)		14,272
5.	System Freight, Line 3	100.00	17,629
6.	Divided System Revenue Freight Train Miles, Ratio No. 11 a:		
7.	Outside Michigan	17.27	3,045
8.	Michigan	82.73	14,584
9.	System Passengers and Baggage, Line 4	100.00	14,272
10.	Divided on System Revenue Passenger Train miles, Ratio No. 11 b.:		
11.	Outside Michigan	16.92	2,415
12.	Michigan	83.08	11,857
13.	Michigan Passengers and Baggage, Line 12	100.00	11,857
14.	Divided on Michigan Passenger miles, Ratio No. 10:		
15.	Interstate	35.31	4,187
16.	Intrastate	64.69	7,670

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 54, Outside Agencies.

			%	$
1.	System Total, per Annual Report			44,617
2.	Allocated to Services by Delf:			
3.	Freight			16,749
4.	Passenger (all Passengers and Baggage)			27,868
5.	System Freight, Line 3		100.00	16,749
6.	Divided on System Revenue Freight Train Miles, Ratio No. 11 a.:			
7.	Outside Michigan		17.27	2,893
8.	Michigan		82.73	13,856
9.	System Passengers and Baggage, Line 4		100.00	27,868
10.	Divided on System Revenue Passenger Train Miles, Ratio No. 11 b.:			
11.	Outside Michigan		16.92	4,715
12.	Michigan		83.08	23,153
13.	Michigan Passengers and Baggage, Line 12		100.00	23,153
14.	Divided, by agreement, on the basis of the allocations and assignments of the years 1910, 1911, 1912 and 1913	$134,057		
15.	Interstate	123,373	92.03	21,308
16.	Intrastate	10,684	7.97	1,845

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 55, Advertising.

			%	$
1.	System Total per Annual Report			5,046
2.	Allocated to Services by Delf:			
3.	Freight			8
4.	Passenger (all Passengers and Baggage)			5,038
5.	System Freight, Line 3		100.00	8
6.	Divided on System Revenue Freight Train miles, Ratio No. 11 a:			
7.	Outside Michigan		17.27	1
8.	Michigan		82.73	7
9.	System Passengers and Baggage, Line 4		100.00	5,038
10.	Divided on System Revenue Passenger Train miles, Ratio No. 11 b.:			
11.	Outside Michigan		16.92	852
12.	Michigan		83.08	4,186
13.	Michigan Passengers and Baggage, Line 12		100.00	4,186
14.	Divided, by agreement, on the basis of the allocations and assignments of the years 1910, 1911, 1912 and 1913	$18,909		
15.	Interstate	13,057	69.06	2,891
16.	Intrastate	5,852	30.94	1,295

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 56, Traffic Associations.

	$
1. System Total per Annual Report, $297; allocated to Michigan by Delf.	245
All Freight.	

No. 57, Fast Freight Lines.

	$
1. System Total Per Annual Report, $660; allocated to Michigan by Delf.	546
All Freight.	

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 58, Industrial and Immigration Bureaus.

			%	$
1.	System Total per Annual Report		100.00	11,056
2.	Divided on basis of Delf's System, Frt. and Pass. Rev.	$3,313,552		
3.	Freight	2,091,597	63.12	6,979
4.	Passenger (All Pas. and Baggage)	1,221,955	36.88	4,077
5.	System Freight, Line 3		100.00	6,979
6.	Divided on basis of Delf's System Freight Revenue	$2,091,597		
7.	Outside Michigan	273,536	13.08	913
8.	Michigan	1,818,061	86.92	6,066
9.	System Passengers and Baggage, Line 4		100.00	4,077
10.	Divided on basis of Delf's System Passenger Revenue	$1,221,955		
11.	Outside Michigan	167,941	13.74	560
12.	Michigan	1,054,014	86.26	3,517
13.	Michigan Passengers and Baggage, Line 12		100.00	3,517
14.	Divided on Michiagn Passenger miles, Ratio No. 10:			
15.	Interstate		35.31	1,242
16.	Intrastate		64.69	2,275

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 59, Stationery and Printing.

		%	$
1.	System Total per Annual Report		12,130
2.	Allocated to Services by Delf:		
3.	Freight		7,915
4.	Passenger (all Passengers and Baggage)		4,215
5.	System Freight, Line 3	100.00	7,915
6.	Divided on System Revenue Freight Train Miles, Ratio No. 11 a:		
7.	Outside Michigan	17.27	1,367
8.	Michigan	82.73	6,548
9.	System Passengers and Baggage, Line 4	100.00	4,215
10.	Divided on System Revenue Passenger Train Miles, Ratio No. 11 b:		
11.	Outside Michigan	16.92	713
12.	Michigan	83.08	3,502
13.	Michigan Passengers and Baggage, Line 12	100.00	3,502
14.	Divided on Michigan Passenger miles, Ratio No. 10:		
15.	Interstate	35.31	1,237
16.	Intrastate	64.69	2,265

IV. TRANSPORTATION—RAIL LINE

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

IV. TRANSPORTATION.

No. 61, Superintendence.

			%	$
1.	System Total, per Annual Report			21,998
2.	Assigned to Services:			
3.	Freight (85% of Car Accountant's pay roll)			4,029
4.	Passenger (15% of Car Accountant's pay roll)			711
5.	Common Freight and Passenger (all other than Car Accountant's pay roll)			17,258
6.	System Freight, Line 3		100.00	4,029
7.	Divided relatively with the total mileage of Freight train cars in and outside of Michigan. (Delf's Ex.):			
8.	Outside Michigan		15.68	632
9.	Michigan		84.32	3,397
10.	System Passenger, Line 4		100.00	711
11.	Divided relatively with the total mileage of Passenger train cars in and outside of Mich. (Delf's Ex.):			
12.	Outside Michigan		15.38	109
13.	Michigan		84.62	602
14.	Michigan Passenger, Line 13		100.00	602
15.	Divided on Michigan Total Passenger train car miles, Ratio No. 3:			
16.	Sleepers and Diners		29.37	177
17.	Mail and Express		14.63	88
18.	Passengers and Baggage		56.00	337
19.	System Common, Line 5		100.00	17,258
20.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 62 to 105 inclusive, except 94 and 97 (see detail page following)	$1,259,985		
21.	Outside Michigan	200,353	15.90	2,744
22.	Michigan	1,059,632	84.10	14,514

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 61, Superintendence. (Continued)

			%	$
23.	Michigan Common, Line 22		100.00	14,514
24.	Divided relatively with the Total of charges to Michigan Freight and Passenger (MR and DSS&A) in Accounts 62 to 91 inclusive, 99 and 100 (see detail page following):	$1,035,736		
25.	Freight	737,760	71.23	10,338
26.	Passenger—M. R.	12,473	1.20	174
27.	Passenger—D. S. S. & A.	285,503	27.57	4,002
28.	Michigan D. S. S. & A. Passenger, Line 27		100.00	4,002
29.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 62 to 91 inclusive, 99 and 100 (see detail page following)	$ 285,503		
30.	Sleepers and Diners	90,566	31.72	1,269
31.	Mail and Express	35,324	12.37	495
32.	Passengers and Baggage	159,613	55.91	2,238
33.	Michigan Freight Recap:			
34.	Car Accountant's Pay Roll, Line 9			3,397
35.	Other, Line 25			10,338
36.	Total Michigan Freight			13,735
37.	Michigan Passenger Recap:			
38.	Car Accountant's Pay Roll, Line 13			602
39.	Other, Line 27			4,002
40.	Total Michigan Passenger			4,604
41.	Michigan Sleepers and Diners Recap:			
42.	Car Accountant's Pay Roll, Line 16			177
43.	Other, Line 30			1,269
44.	Total Michigan Sleepers and Diners			1,446
45.	Michigan Mail and Express Recap:			
46.	Car Accountant's Pay Roll, Line 17			88
47.	Other, Line 31			495
48.	Total Michigan Mail and Express			583

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 61, Superintendence. (Continued)

49.	Michigan Passengers and Baggage Recap:		
50.	Car Accountant's Pay Roll. Line 18		337
51.	Other, Line 32		2,238
52.	Total Michigan Passengers and Baggage		2,575
53.	Michigan Passengers and Baggage, Line 52	100.00	2,575
54.	Divided on Michigan Passenger miles, Ratio No. 10:		
55.	Interstate	35.31	909
56.	Intrastate	64.69	1,666

Fiscal Year 1914.

Details for Dividing Accounts Nos. **61, 93, 94, 97, 98, 101, 102, 103, 104 and 105.**

			MICHIGAN						
						D. S. S. & A. Passenger			
Account No.	System Total	Outside Michigan	Total	Freight	Mineral Range Passenger	Total	Sleepers & Diners	Mail & Express	Passengers & Bag'ge
	$	$	$	$	$	$	$	$	$
62	16,585	2,448	14,137	10,887		3,250	955	475	1,820
63	166,606	19,231	147,375	127,019		20,356		2,036	18,320
64	1,793	310	1,483	1,483					
65	21,704		21,704	21,704					
66	12,272	1,416	10,856	9,357		1,499			1,499
67	4,659		4,659	4,511		148	76	7	65
68	47,655		47,655	46,140		1,515	773	73	669
69	4,052		4,052	3,923		129	66	6	57
70	1,312		1,312	1,270		42	21	2	19
71	27,328		27,328	26,459		869	443	42	384
72	14,310		14,310	13,902		408	208	20	180
73	22,745		22,745	22,022		723	369	35	319
74	1,520		1,520	1,472		48	25	2	21
75	280		280	271		9	5	0	4
76	425		425	411		14	7	1	6
77	42,671	24,076	18,595	12,103		6,492	2,623	897	2,972
78	14,341*		14,341*	12,352*		1,989*	804*	275*	910*

PAGE CUT OFF

THIS PAGE VERTICAL

Details for Dividing Accounts Nos. 61, 93, 94, 97, 98, 101, 102, 103, 104 and 105—(Continued).

80	180,007	30,521	149,486	89,040	3,033	57,413	23,200	7,929	26,284
81	51,807	8,890	42,917	25,021		17,896	7,232	2,471	8,193
82	323,794	55,456	268,338	176,328	4,612	87,398	35,318	12,070	40,010
83	18,773	3,216	15,557	10,223	267	5,067	2,048	700	2,319
84	4,328	741	3,587	2,357	62	1,168	472	161	535
85	5,654	976	4,678	3,413	73	1,192	482	165	545
88	214,038	36,292	177,746	119,299	3,025	55,422	9,218	4,600	41,604
89	40,664	6,664	34,000	6,927	1,401	25,672	7,707	3,846	14,119
90	1,277	1,253	24	23		1			1
91	8,362	440	7,922	7,507		415	122	61	232
99	8,513	1,473	7,040	7,040					
100	667	321	346			346			346
Total	1,229,460	193,724	1,035,736	737,760	12,473	285,503	90,566	35,324	159,613
93	4,100	1,055	3,045						
98	1,067	151	916						
101	6,815	2,005	4,810						
102	1,002	68	934						
103	19,981	2,941	17,040						
104	2,541	1,827	714						
105	4,981*	1,418*	3,563*						
Total	1,259,985	200,353	1,059,632						

*NOTE—Typewritten in red.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 62, Dispatching Trains.

			%	$
1.	System Total per Annual Report		100.00	16,585
2.	Divided on System Time, Ratio No. 4a:			
3.	Freight		76.61	12,706
4.	Passenger		23.39	3,879
5.	System Freight, Line 3		100.00	12,706
6.	Divided relatively with the Total Mileage of Freight trains (including proportion of Mixed and Special) plus Train and Yard Switching in and outside of Michigan	1,354,176		
7.	Outside Michigan	193,929	14.32	1,819
8.	Michigan	1,160,247	85.68	10,887
9.	System Passenger, Line 4		100.00	3,879
10.	Divided relatively with the total mileage of Passenger trains (including C&NW and CM&StP operations into Marquette and proportion of Mixed and Special) plus Train and Yard Switching, in and outside of Michigan	979,367		
11.	Outside Michigan	158,749	16.21	629
12.	Michigan	820,618	83.79	3,250
13.	Michigan Passenger, Line 12		100.00	3,250
14.	Divided on Michigan Total Passenger Train Car miles, Ratio No. 3:			
15.	Sleepers and Diners		29.37	955
16.	Mail and Express		14.63	475
17.	Passengers and Baggage		56.00	1,820
18.	Michigan Passengers and Baggage, Line 17		100.00	1,820
19.	Divided on Michigan Passenger Miles, Ratio No. 10:			
20.	Interstate		35.31	643
21.	Intrastate		64.69	1,177

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 63, Station Employees.

		%	$
1.	System Total per Annual Report, $166,606 allocated to Michigan by Delf.:		147,375
2.	Allocated to Freight and Passenger by us (balance to Common):		
3.	Freight		67,108
4.	Common Freight and Passenger		69,510
5.	Passenger		10,757
6.	Michigan Common, Line 4	100.00	69,510
7.	Divided on Station Pay roll, Ratio No. 17:		
8.	Freight	86.19	59,911
9.	Passenger	13.81	9,599
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		67,108
12.	Comon, Line 8		59,911
13.	Total Michigan Freight		127,019
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		10,757
16.	Common, Line 9		9,599
17.	Total Michigan Passenger		20,356
18.	10% of Michigan Passenger charged to Mail and Express because of Station Employees having to handle Mail to and from and at Stations.		2,036
19.	Balance, all Passengers and Baggage		18,320
20.	Michigan Passengers and Baggage, Line 19	100.00	18,320
21.	Divided on Michigan Passenger miles, Ratio No. 10:		
22.	Interstate	35.31	6,469
23.	Intrastate	64.69	11,851

NOTE:—This account was allocated by us, as indicated above. Of the total passenger allocation, the following is directly charged labor on account of Mail:

Sault Ste. Marie	$ 360
Marquette	420
Champion	30
Houghton	270
Total	$1,080

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 64, Weighing and Car Service Associations.
No. 65, Coal and Ore Docks.

	No. 64	No. 65
	$	$
1. System Totals, per Annual Report	1,793	21,704
2. Allocated to Michigan by Delf. All Freight.	1,483	21,704

No. 66, Station Supplies and Expenses.

		%	$
1. System Total, per Annual Report, $12,272; allocated to Michigan by Delf.		100.00	10,856
2. Divided relatively with the total charges to Michigan Freight and Passenger in Account No. 63	$147,375		
3. Freight	127,019	86.19	9,357
4. Passenger (all Passengers and Baggage)	20,356	13.81	1,499
5. Michigan Passengers and Baggage, Line 4		100.00	1,499
6. Divided on Passenger Miles, Ratio No. 10:			
7. Interstate		35.31	529
8. Intrastate		64.69	970

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 67, Yardmasters and their Clerks.
No. 68, Yard Conductors and Brakemen.
No. 69, Yard Switch and Signal Tenders.

		%	No. 67 $	No. 68 $	No. 69 $
1.	System Totals per Annual Report (All allocated to Michigan by Delf.)	100.00	4,659	47,655	4,052
2.	Divided on Michigan total yard switching miles, Ratio No. 13 a:				
3.	Freight	96.82	4,511	46,140	3,923
4.	Passenger	3.18	148	1,515	129
5.	Michigan Passenger, Line 4	100.00	148	1,515	129
6.	Divided on Michigan Passenger Yard, Switching Miles, Ratio No. 13 b:				
7.	Sleepers and Diners	51.01	76	773	66
8.	Mail and Express	4.80	7	73	6
9.	Passengers and Baggage	44.19	65	669	57
10.	Michigan Passengers and Baggage, Line 9	100.00	65	669	57
11.	Divided on Michigan Passenger Miles, Ratio No. 10:				
12.	Interstate	35.31	23	236	20
13.	Intrastate	64.69	42	433	37

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 70, Yard Supplies and Expenses.
No. 71, Yard Enginemen.

	%	No. 70 $	No. 71 $
1. System Total, per Annual Report (all allocated to Michigan by Delf.)	100.00	1,312	27,328
2. Divided on Michigan Total Yard Switching miles, Ratio No. 13 a:			
3. Freight	96.82	1,270	26,459
4. Passenger	3.18	42	869
5. Michigan Passenger, Line 4	100.00	42	869
6. Divided on Michigan Passenger Yard Switching, Ratio No. 13 b:			
7. Sleepers and Diners	51.01	21	443
8. Mail and Express	4.80	2	42
9. Passengers and Baggage	44.19	19	384
10. Michigan Passengers and Baggage, Line 9	100.00	19	384
11. Divided on Michigan Passenger miles, Ratio No. 10:			
12. Interstate	35.31	7	136
13. Intrastate	64.69	12	248

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 72, Enginehouse Expenses—Yard.

		%	$
1.	System Total, per Annual Report, $14,310; allocated to Michigan by Delf.		14,310
2.	Allocated to Services:		
3.	Freight (Soo roundhouse)		1,488
4.	Common Freight and Passenger		12,822
5.	Michigan Common, Line 4	100.00	12,822
6.	Divided on Michigan Total Yard Switching miles, Ratio No. 13 a:		
7.	Freight	96.82	12,414
8.	Passenger	3.18	408
9.	Michigan Freight Recap:		
10.	Exclusive, Line 3		1,488
11.	Common, Line 7		12,414
12.	Total Michigan Freight.		13,902
13.	Michigan Passenger, Line 8	100.00	408
14.	Divided on Michigan Passenger Yard Switching miles, Ratio No. 13 b:		
15.	Sleepers and Diners	51.01	208
16.	Mail and Express	4.80	20
17.	Passengers and Baggage	44.19	180
18.	Michigan Passengers and Baggage, Line 17	100.00	180
19.	Divided on Michigan Passenger Miles, Ratio No. 10:		
20.	Interstate	35.31	64
21.	Intrastate	64.69	116

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 73, Fuel for Yard Locomotives.
No. 74, Water for Yard Locomotives.
No. 75, Lubricants for Yard Locomotives.
No. 76, Other Supplies for Yard Locomotives.

		%	No. 73 $	No. 74 $	No. 75 $	No. 76 $
1.	System Total, per Annual Report (all allocated to Michigan by Delf)	100.00	22,745	1,520	280	425
2.	Divided on Michigan Total Yard Switching miles, Ratio No. 13 a					
3.	Freight	96.82	22,022	1,472	271	411
4.	Passenger	3.18	723	48	9	14
5.	Michigan Passenger, Line 4	100.00	723	48	9	14
6.	Divided on Michigan Passenger Yard and on Mineral Range and D. S. S. & A.		1,013,057			
7.	Sleepers and Diners	51.01	369	25	5	7
8.	Mail and Express	4.80	35	2	0	1
9.	Passenger and Baggage	44.19	319	21	4	6
10.	Michigan Pass. and Bag'ge, Line 9	100.00	319	21	4	6
11.	Divided on Michigan Passenger miles, Ratio No. 10					
12.	Interstate	35.31	113	7	1	2
13.	Intrastate	64.69	206	14	3	4

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 77, Operating Joint Yards and Terminals—Dr.

		%	$
1.	System Total, per Annual Report, $42,671; allocated to Michigan by Delf		18,595
2.	Allocated to Services by Delf		
3.	Freight		12,103
4.	Passenger		6,492
5.	Michigan Passenger, Line 4	100.00	6,492
6.	Divided on Michigan Passenger Gross Ton-Miles, Ratio No. 1 b		
7.	Sleepers and Diners	40,41	2,623
8.	Mail and Express	13.81	897
9.	Passengers and Baggage	45.78	2,972
10.	Michigan Passengers and Baggage, Line 9	100.00	2,972
11.	Divided on Michigan Passenger miles, Ratio No. 10		
12.	Interstate	35.31	1,049
13.	Intrastate	64.69	1,923

NOTE:—This charge is for Terminal Service at Calumet and the Soo.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 78, Operating Joint Yards and Terminals—Cr.

			%	$
1.	System Total, per Annual Report, $14,341;* allocated to Michigan by Delf			14,341*
2.	Allocated to Services			
3.	Freight			11,128*
4.	Common Freight and Pass. (Soo Roundhouse)			3,213*
5.	Michigan Common, Line 4		100.00	3,213*
6.	Divided relatively with Delf's assignment of Soo Enginehouse Expenses—Train, 1916	$5,698		
7.	Freight	2,172	38.11	1,224*
8.	Passenger	3,526	61.89	1,989*
9.	Michigan Freight Recap.:			
10.	Exclusive, Line 3			11,128*
11.	Common, Line 7			1,224*
12.	Total Michigan Freight			12,352*
13.	Michigan Passenger, Line 8		100.00	1,989*
14.	Divided on Michigan Passenger Gross Ton-miles, Ratio No. 1 b			
15.	Sleepers and Diners		40.41	804*
16.	Mail and Express		13.81	275*
17.	Passengers and Baggage		45.78	910*
18.	Michigan Passengers and Baggage, Line 17		100.00	910*
19.	Divided on Michigan Passenger Miles, Ratio No. 10			
20.	Interstate		35.31	321*
21.	Intrastate		64.69	589*

*NOTE:—Typewritten in red.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 80, Road Enginemen.

			%	$
1.	System Total, per Annual Report			180,007
2.	Assigned to Services by Delf			
3.	Freight			108,124
4.	Passenger			71,883
5.	System Freight, Line 3		100.00	108,124
6.	Divided relatively with the Total Mileage of Freight Train Locomotives (including proportion of Mixed and Special) in and outside of Michigan	1,207,678		
7.	Outside Michigan	213,208	17.65	19,084
8.	Michigan	994,470	82.35	89.040
9.	System Passenger, Line 4		100.00	71,883
10.	Divided relatively with the Total Mileage of D. S. S. & A. Passenger Train Locomotives (including proportion of Mixed and Special) in and outside of Michigan, and on Mineral Range and D. S. S. & A.	1,013,057		
11.	Outside Michigan	161,204	15.91	11,437
12.	Michigan—Mineral Range	42,701	4.22	3,033
13.	Michigan—D. S. S. & A.	809,152	79.87	57,413
14.	Michigan D. S. S. & A. Passenger, Line 13		100.00	57,413
15.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1 b			
16.	Sleepers and Diners		40.41	23,200
17.	Mail and Express		13.81	7,929
18.	Passengers and Baggage		45.78	26,284
19.	Michigan Passengers and Baggage, Line 18		100.00	26,284
20.	Divided on Michigan Passenger Miles, Ratio No. 10			
21.	Interstate		35.31	9,281
22.	Intrastate		64.69	17,003

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 81, Enginehouse Expenses—Road.

			%	$
1.	System Total, per Annual Report, $51,807; assigned to Michigan by Delf		100.00	42,917
2.	Divided relatively with Delf's assignment to Michigan Freight and Passenger in Account 400 in 1916	$39,329		
3.	Freight	22,930	58.30	25,021
4.	Passenger	16,399	41.70	17,896
5.	Michigan Passenger, Line 4		100.00	17,896
6.	Divided on Michigan Passenger Gross Ton-miles, Ratio No. 1 b			
7.	Sleepers and Diners		40.41	7,232
8.	Mail and Express		13.81	2,471
9.	Passengers and Baggage		45.78	8,193
10.	Michigan Passengers and Baggage, Line 9		100.00	8,193
11.	Divided on Michigan Passenger miles, Ratio No. 10			
12.	Interstate		35.31	2,893
13.	Intrastate		64.69	5,300

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 82, Fuel for Road Locomotives.

			%	$
1.	System Total per Annual Report			323,794
2.	Divided to Services			
3.	Regular Freight			212,560
4.	Mixed (All Michigan)			2,083
5.	Special			255
6.	Regular Passenger			108,896
7.	System Regular Freight, Line 3		100.00	212,560
8.	Divided relatively with the Total Mileage of Regular Freight Train Locomotives in and outside of Michigan	1,191,526		
9.	Outside Michigan	213,119	17.89	38,027
10.	Michigan	978,407	82.11	174,533
11.	Michigan Mixed, Line 4		100.00	2,083
12.	Divided relatively with the Average Number of Freight and Passenger Cars in Mixed Trains in 1915-1916			
13.	Freight		82.33	1,715
14.	Passenger		17.67	368
15.	System Special, Line 5		100.00	255
16.	Divided relatively with the Total Mileage of Special Train Locomotives in and outside of Michigan	1,681		
17.	Outside Michigan	322	19.15	49
18.	Michigan	1,359	80.85	206
19.	Michigan Special, Line 18		100.00	206
20.	Divided relatively with the Michigan mileage of Special Train Locomotives in Mixed and Passenger Services	1,359		
21.	Mixed	638	46.94	97
22.	Passenger	721	53.06	109
23.	Michigan Special Mixed, Line 21		100.00	97
24.	Divided relatively with the Average Number of Freight and Passenger Cars in Mixed Trains in 1915-1916			
25.	Freight		82.33	80
26.	Passenger		17.67	17

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 82, Fuel for Road Locomotives—(Continued).

			%	$
27.	Michigan Special Passenger Recap.:			
28.	Exclusive, Line 22			109
29.	Mixed, Line 26			17
30.	Total Michigan Special Passenger			126
31.	System Regular Passenger, Line 6		100.00	108,896
32.	Divided relatively with the Total Mileage of Regular D. S. S. & A. Passenger Train Locomotives in and outside of Michigan	1,008,657		
33.	Outside Michigan	160,971	15.96	17,380
34.	Michigan (including Mineral Range)	847,686	84.04	91,516
35.	Michigan Regular Passenger, Line 34		100.00	91,516
36.	Divided relatively with the Michigan Mileage of D. S. S. & A. Passenger Train Locomotives on Mineral Range and D. S. S. & A.	847,686		
37.	Mineral Range	42,701	5.04	4,612
38.	D. S. S. & A.	804,985	94.96	86,904
39.	Michigan Freight Recap.:			
40.	Regular, Line 10			174,533
41.	Mixed, Line 13			1,715
42.	Special, Line 25			80
43.	Total Michigan Freight			176,328
44.	Michigan Passenger Recap.:			
45.	Mixed, Line 14			368
46.	Special, Line 30			126
47.	Regular, Line 38			86,904
48.	Total Michigan Passenger			87,398
49.	Michigan Passenger, Line 48		100.00	87,398
50.	Divided on Michigan Passenger Gross Ton-miles, Ratio No. 1 b			
51.	Sleepers and Diners		40.41	35,318
52.	Mail and Express		13.81	12,070
53.	Passengers and Baggage		45.78	40,010
54.	Michigan Passengers and Baggage, Line 53		100.00	40,010
55.	Divided on Michigan Passenger Miles, Ratio No. 10			
56.	Interstate		35.31	14,128
57.	Intrastate		64.69	25,882

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 83, Water for Road Locomotives.
No. 84, Lubricants for Road Locomotives.

			No. 83	No. 84
		%	$	$
1. System Totals, per Annual Report		100.00	18,773	4,328
2. Divided to Services relatively with Account No. 82	$323,794			
3. Regular Freight	212,560	65.65	12,324	2,841
4. Mixed (all Michigan)	2,083	.64	120	28
5. Special	255	.08	15	3
6. Regular Passenger	108,896	33.63	6,314	1,456
7. System Regular Freight, Line 3		100.00	12,324	2,841
8. Divided relatively with Account No. 82				
9. Outside Michigan		17.89	2,205	508
10. Michigan		82.11	10,119	2,333
11. Michigan Mixed, Line 4		100.00	120	28
12. Divided relatively with Account No. 82				
13. Freight		82.33	99	23
14. Passenger		17.67	21	5
15. System Special, Line 5		100.00	15	3
16. Divided relatively with Account No. 82				
17. Outside Michigan		19.15	3	1
18. Michigan		80.85	12	2
19. Michigan Special, Line 18		100.00	12	2
20. Divided relatively with Account No. 82				
21. Mixed		46.94	6	1
22. Passenger		53.06	6	1
23. Michigan Special Mixed, Line 21		100.00	6	1
24. Divided relatively with Account No. 82				
25. Freight		82.33	5	1
26. Passenger		17.67	1	0
27. Michigan Special Passenger Recap.:				
28. Exclusive, Line 22			6	1
29. Mixed, Line 26			1	0
30. Total Michigan Special Passenger			7	1

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 83, Water for Road Locomotives.
No. 84, Lubricants for Road Locomotives.
(Continued)

		%	No. 83 $	No. 84 $
31.	System Regular Passenger, Line 6	100.00	6,314	1,456
32.	Divided relatively with Account No. 82			
33.	Outside Michigan	15.96	1,008	232
34.	Michigan	84.04	5,306	1,224
35.	Michigan Regular Passenger, Line 34	100.00	5,306	1,224
36.	Divided relatively with Account No. 82			
37.	Mineral Range	5.04	267	62
38.	D. S. S. & A.	94.96	5,039	1,162
39.	Michigan Freight Recap.:			
40.	Regular, Line 10		10,119	2,333
41.	Mixed, Line 13		99	23
42.	Special, Line 25		5	1
43.	Total Michigan Freight		10,223	2,357
44.	Michigan Passenger Recap.:			
45.	Mixed, Line 14		21	5
46.	Special, Line 30		7	1
47.	Regular, Line 38		5,039	1,162
48.	Total Michigan Passenger		5,067	1,168
49.	Michigan Passenger, Line 48	100.00	5,067	1,168
50.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1 b			
51.	Sleepers and Diners	40.41	2,048	472
52.	Mail and Express	13.81	700	161
53.	Passengers and Baggage	45.78	2,319	535
54.	Michigan Passengers and Baggage, Line 53	100.00	2,319	535
55.	Divided on Michigan Passenger Miles, Ratio No. 10			
56.	Interstate	35.31	819	189
57.	Intrastate	64.69	1,500	346

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 85, Other Supplies for Road Locomotives.

			%	$
1.	System Total, per Annual Report			5,654
2.	Divided to Services (Hillman data)			
3.	Mineral Range Passenger (all Michigan)			73
4.	Regular Freight			4,123
5.	Mixed (all Michigan)			32
6.	Special			6
7.	Regular Passenger			1,420
8.	System Regular Freight, Line 4		100.00	4,123
9.	Divided relatively with the Total Mileage of Regular Freight Train Locomotives in and outside of Michigan.	1,191,526		
10.	Outside Michigan	213,119	17.89	738
11.	Michigan	978,407	82.11	3,385
12.	Michigan Mixed, Line 5		100.00	32
13.	Divided relatively with the average number of Freight and Passenger Cars in Mixed Trains in 1915-1916			
14.	Freight		82.33	26
15.	Passenger		17.67	6
16.	System Special, Line 6		100.00	6
17.	Divided relatively with the Total Mileage of Special Train Locomotives in and outside of Michigan	1,681		
18.	Outside Michigan	322	19.15	1
19.	Michigan	1,359	80.85	5
20.	Michigan Special, Line 19		100.00	5
21.	Divided relatively with the Michigan Mileage of Special Train Locomotives in Mixed and Passenger Services	1,359		
22.	Mixed	638	46.94	2
23.	Passenger	721	53.06	3

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 85, Other Supplies for Road Locomotives—(Continued).

				%	$
24.	Michigan Special Mixed, Line 22			100.00	2
25.	Divided relatively with the Average Number of Freight and Passenger Cars in Mixed Trains in 1915-1916				
26.	Freight			82.33	2
27.	Passenger			17.67	0
28.	System Regular Passenger, Line 7			100.00	1,420
29.	Divided relatively with the Total Mileage of Regular D. S. S. & A. Passenger Train Locomotives in and outside of Michigan	965,956			
30.	Outside Michigan	160,971		16.66	237
31.	Michigan	804,985		83.34	1,183
32.	Michigan Freight Recap.:				
33.	Regular, Line 11				3,385
34.	Mixed, Line 14				26
35.	Special, Line 26				2
36.	Total Michigan Freight				3,413
37.	Michigan Passenger Recap.:				
38.	Mixed, Line 15				6
39.	Special, Line 23				3
40.	Regular, Line 31				1,183
41.	Total Michigan Passenger				1,192
42.	Michigan Passenger, Line 41			100.00	1,192
43.	Divided on Michigan Passenger Gross Ton Miles, Ratio 1 b				
44.	Sleepers and Diners			40.41	482
45.	Mail and Express			13.81	165
46.	Passengers and Baggage			45.78	545
47.	Michigan Passengers and Baggage, Line 46			100.00	545
48.	Divided on Michigan Passenger Miles, Ratio No. 10				
49.	Interstate			35.31	192
50.	Intrastate			64.69	353

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 88, Road Trainmen.

			%	$
1.	System Total, per Annual Report			214,038
2.	Assigned to Services by Delf:			
3.	Freight			144,342
4.	Passenger			69,696
5.	System Freight, Line 3		100.00	144,342
6.	Divided relatively with the Total Mileage of Freight Trains (including proportion of Mixed and Special) plus Train Switching, in and outside of Michigan	1,117,999		
7.	Outside Michigan	193,929	17.35	25,043
8.	Michigan	924,070	82.65	119,299
9.	System Passenger, Line 4		100.00	69,696
10.	Divided relatively with the Total Mileage of D. S. S. & A. Passenger Trains (including proportion of Mixed and Special) plus Train Switching in and outside of Michigan and on Mineral Range and D. S. S. & A.	983,321		
11.	Outside Michigan	158,749	16.14	11,249
12.	Michigan—Mineral Range	42,701 (a)	4.34	3,025
13.	Michigan—D. S. S. & A.	781,871	79.52	55,422
14.	Michigan D. S. S. & A. Passenger, Line 13		100.00	55,422
15.	Divided on Passenger Trainmen's Pay Roll, Ratio No. 17 a			
16.	Conductors		53.11	29,435
17.	Brakemen		28.85	15,989
18.	Baggage (all Passengers and Baggage)		18.04	9,998
19.	Michigan Passenger Train Conductors, Line 16			29,435
20.	50% to Passengers and Baggage			14,718
21.	50% to Common Train Operation			14,717

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 88, Road Trainmen—(Continued).

		%	$
22.	Michigan Common Passenger Train Operation Recap.:		
23.	Brakemen, Line 17		15,989
24.	50% Conductors, Line 21		14,717
25.	Total Mich. Common Pass. Train Operation		30,706
26.	Michigan Common Pass. Train Operation, Line 25	100.00	30,706
27.	Divided in Michigan D. S. S. & A. Passenger Train Car Miles, Ratio No. 3 a		
28.	Sleepers and Diners	30.02	9,218
29.	Mail and Express	14.98	4,600
30.	Passengers and Baggage	55.00	16,888
31.	Michigan Passengers and Baggage Recap.:		
32.	Baggagemen, Line 18		9,998
33.	50% Conductors, Line 20		14,718
34.	Common, Line 30		16,888
35.	Total Michigan Passengers and Baggage		41,604
36.	Michigan Passengers and Baggage, Line 35	100.00	41,604
37.	Divided on Michigan Passenger Miles, Ratio No. 10		
38.	Interstate	35.31	14,690
39.	Intrastate	64.69	26,914

NOTE:—(a) Locomotive miles D. S. S. & A. locomotives taken as train miles.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 89, Train Supplies and Expenses.

			%	$
1.	System Total, per Annual Report			40,664
2.	Assigned to Services by Delf:			
3.	Freight			8,381
4.	Passenger			32,283
5.	System Freight, Line 3		100.00	8,381
6.	Divided relatively with the Total Mileage of Freight Trains (including proportion of Mixed and Special) plus Train Switching in and outside of Michigan	1,117,999		
7.	Outside Michigan	193,929	17.35	1,454
8.	Michigan	924,070	82.65	6,927
9.	System Passenger, Line 4		100.00	32,283
10.	Divided relatively with the Total Mileage of D. S. S. & A. Passenger Trains (including proportion of Mixed and Special) plus Train Switching in and outside of Michigan and on Mineral Range and D. S. S. & A.	983,321		
11.	Outside Michigan	158,749	16.14	5,210
12.	Michigan—Mineral Range	42,701	(a) 4.34	1,401
13.	Michigan—D. S. S. & A.	781,871	79.52	25,672
14.	Michigan D. S. S. & A. Passenger, Line 13		100.00	25,672
15.	Divided on Michigan D. S. S. & A. Passenger Train Car Miles, Ratio No. 3 a			
16.	Sleepers and Diners		30.02	7,707
17.	Mail and Express		14.98	3,846
18.	Passengers and Baggage		55.00	14,119
19.	Michigan Passengers and Baggage, Line 18		100.00	14,119
20.	Divided on Michigan Passenger Miles, Ratio No. 10			
21.	Interstate		35.31	4,985
22.	Intrastate		64.69	9,134

NOTE:—(a) Locomotive miles D. S. S. & A. locomotives taken as train miles.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 90, Interlockers and Block and Other Signals.

		%	$
1.	System Total, per Annual Report, $1,277; allocated to Michigan by Delf	100.00	24
2.	Divided as per data on page following Account No. 91:		
3.	Freight	94.76	23
4.	Passenger	5.24	1

Michigan Passenger, all Intrastate Passengers and Baggage.

NOTE:—The Michigan portion of this charge is for Fuel, probably for Negaunee Semaphore.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 91, Crossing Flagmen and Gatemen.

		%	$
1.	System Totals, per Annual Report, $8,362; allocated to Michigan	100.00	7,922
2.	Divided as per data on following page:		
3.	Freight	94.76	7,507
4.	Passenger	5.24	415
5.	Michigan Passenger, Line 4	100.00	415
6.	Divided on Michigan Total Passenger-train Car-Miles, Ratio No. 3		
7.	Sleepers and Diners	29.37	122
8.	Mail and Express	14.63	61
9.	Passengers and Baggage	56.00	232
10.	Michigan Passengers and Baggage, Line 9	100.00	232
11.	Divided on Michigan Passenger Miles, Ratio No. 10		
12.	Interstate	35.31	82
13.	Intrastate	64.69	150

NOTE:—The Michigan portion of this charge is made up of the following:

Marquette	$4,541.40
St. Ignace	330.00
Ishpeming	1,211.85
Negaunee Semaphore	840.00
Negaunee Crossings	911.65
Fuel and Supplies	39.00
Various	47.90
Total Michigan	$7,921.80

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Data for Dividing Accounts Nos. 90 and 91.

Data is based on the following:

(a) An examination of the Despatcher's Daily Train Register for one week in July, 1915, and one week in January, 1916, from which we were able to ascertain the number of trains, class of service and approximate amount of time spent by each in the protected areas at Negaunee and Ishpeming, and the number and class of service of trains, entering and leaving Marquette and St. Ignace.

(b) The estimating of amounts of time for train and train locomotive movements, at Marquette and St. Ignace, for trains for which no other approximation of time could be had, as follows:

		Minutes
St. Ignace:	Passenger Trains, East and West bound in Yard Limits	2
	Passenger Locomotives to or from Roundhouse	2
	Freight Trains Departing	4
	Freight Locomotives to or from Roundhouse	2
Marquette:	Passenger Trains, East and West bound to and from Yard Limits	5
	Passenger Locomotives to or from Roundhouse	5
	Freight Trains East or West Bound Departures	5
	Freight Trains West Bound Arrivals	10
	Freight Trains East Bound Arrivals	20
	Freight Locomotives to or from Roundhouse	10
	Ore Trains, in or out	5
	Ore Train Locomotives, all movements	10
Yard Switching at all points, per statistical miles		10

	Minutes	%
Results, Passenger Time	5,481	5.24
Freight Time	99,054	94.76
TOTAL	104,535	100.00

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 93, Clearing Wrecks.

			%	$
1.	System Total, per Annual Report, $4,100; allocated to Michigan by Delf			3,045
2.	Allocated to Services by Delf:			
3.	Freight			2,145
4.	Common Freight and Passenger			29
5.	Passenger			871
6.	Michigan Common, Line 4		100.00	29
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 62 to 91 inclusive, 99 and 100 (see detail page following Account No. 61)	$1,023,263		
8.	Freight	737,760	72.10	21
9.	Passenger	285,503	27.90	8
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			2,145
12.	Common, Line 8			21
13.	Total Michigan Freight			2,166
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			871
16.	Common, Line 9			8
17.	Total Michigan Passenger			879
18.	Michigan Passenger, Line 17		100.00	879
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 62 to 91 inclusive, 99 and 100 (see detail page following Acct. No. 61)	$285,503		
20.	Sleepers and Diners	90,566	31.72	279
21.	Mail and Express	35,324	12.37	109
22.	Passengers and Baggage	159,613	55.91	491
23.	Michigan Passengers and Baggage, Line 22		100.00	491
24.	Divided on Michigan Passenger Miles, Ratio No. 10			
25.	Interstate		35.31	173
26.	Intrastate		64.69	318

OFF

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 9¼, Telegraph and Telephone Operation.

			%	$
1.	System Total, per Annual Report		100.00	143
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accts. 62 to 105 inclusive, except 94 and 97 (see detail page following Acct. No. 61)	$1,259,985		
3.	Outside Michigan	200,353	15.90	23
4.	Michigan	1,059,632	84.10	120
5.	Michigan Total, Line 4		100.00	120
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accts 62 to 91 inclusive, 99 and 100 (see detail page following Acct. No. 61)	$1,023,263		
7.	Freight	737,760	72.10	87
8.	Passenger	285,503	27.90	33
9.	Michigan Passenger, Line 8		100.00	33
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accts. 62 to 91 inclusive, 99 and 100 (see detail page following Acct. No. 61)	$285.503		
11.	Sleepers and Diners	90,566	31.72	11
12.	Mail and Express	35,324	12.37	4
13.	Passengers and Baggage	159,613	55.91	18
14.	Michigan Passengers and Baggage, Line 13		100.00	18
15.	Divided on Michigan Passenger Miles, Ratio No. 10			
16.	Interstate		35.31	6
17.	Intrastate		64.69	12

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 97, Stationery and Printing.

			%	$
1.	System Total, per Annual Report		100.00	12,432
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accts. 62 to 105 inclusive, except 94 and 97 (see detail page following Acct. No. 61)	$1,259,985		
3.	Outside Michigan	200,353	15.90	1,977
4.	Michigan	1,059,632	84.10	10,455
5.	Michigan Total, Line 4		100.00	10,455
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accts. 62 to 91 inclusive, 99 and 100 (see detail page following Account No. 61)	$1,023,263		
7.	Freight	737,760	72.10	7,538
8.	Passenger	285,503	27.90	2,917
9.	Michigan Passenger, Line 8		100.00	2,917
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accts. 62 to 91 inclusive, 99 and 100 (see detail page following Acct. No. 61)	$285,503		
11.	Sleepers and Diners	90,566	31.72	925
12.	Mail and Express	35,324	12.37	361
13.	Passengers and Baggage	159,613	55.91	1,631
14.	Michigan Passengers and Baggage, Line 13		100.00	1,631
15.	Divided on Michigan Passenger Miles, Ratio No. 10			
16.	Interstate		35.31	576
17.	Intrastate		64.69	1,055

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 98, Other Expenses.

			%	$
1.	System Total, per Annual Report, $1,067; allocated to Michigan			916
2.	Allocated to Services:			
3.	Freight			652
4.	Common Freight and Passenger			204
5.	Passenger			60
6.	Michigan Common, Line 4		100.00	204
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accts. 62 to 91 inclusive, 99 and 100 (see detail page following Acct. No. 61)	$1,023,263		
8.	Freight	737,760	72.10	147
9.	Passenger	285,503	27.90	57
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			652
12.	Common, Line 8			147
13.	Total Michigan Freight			799
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			60
16.	Common, Line 9			57
17.	Total Michigan Passenger			117
18.	Michigan Passenger, Line 17		100.00	117
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accts. 62 to 91 inclusive, 99 and 100 (see detail page following Acct. No. 61)	$285,503		
20.	Sleepers and Diners	90,566	31.72	37
21.	Mail and Express	35,324	12.37	15
22.	Passengers and Baggage	159,613	55.91	65
23.	Michigan Passengers and Baggage, Line 22		100.00	65
24.	Divided on Michigan Passenger Miles, Ratio No. 10			
25.	Interstate		35.31	23
26.	Intrastate		64.69	42

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 99, Loss and Damage—Freight.

		$
1. System Total, per Annual Report, $8,513; allocated to Michigan		7,04
All Freight.		

No. 100, Loss and Damage—Baggage.

	%	$
1. System Total, per Annual Report, $667; allocated to Michigan (all Passengers and Baggage)		3-
2. Michigan Passengers and Baggage, Line 1	100.00	3-
3. Divided on Michigan Passenger Miles, Ratio No. 10		
4. Interstate	35.31	1:
5. Intrastate	64.69	2:

PAGE CUT OFF

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 101, Damage to Property.

			%	$
1.	System Total, per Annual Report, $6,815; allocated to Michigan by Delf			4,810
2.	Allocated to Services by Delf:			
3.	Freight			3,056
4.	Common Freight and Passenger			1,727
5.	Passenger			27
6.	Michigan Common, Line 4		100.00	1,727
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accts. 62 to 91 inclusive, 99 and 100 (see detail page following Acct. No. 61)	$1,023,263		
8.	Freight	737,760	72.10	1,245
9.	Passenger	285,503	27.90	482
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			3,056
12.	Common, Line 8			1,245
13.	Total Michigan Freight			4,301
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			27
16.	Common, Line 9			482
17.	Total Michigan Passenger			509
18.	Michigan Passenger, Line 17		100.00	509
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accts. 62 to 91 inclusive, 99 and 100 (see detail page following Acct. No. 61)	$285,503		
20.	Sleepers and Diners	90,566	31.72	161
21.	Mail and Express	35,324	12.37	63
22.	Passengers and Baggage	159,613	55.91	285
23.	Michigan Passengers and Baggage, Line 22		100.00	285
24.	Divided on Michigan Passenger Miles, Ratio No. 10			
25.	Interstate		35.31	101
26.	Intrastate		64.69	184

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 102, Damage to Stock on Right of Way.

			%	$
1.	System Total, per Annual Report, $1,002; allocated to Michigan by Delf.			934
2.	Allocated to Services by Delf:			
3.	Freight			74
4.	Passenger			860
5.	Michigan Passenger, Line 4		100.00	860
6.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 62 to 91 inclusive, 99 and 100 (see detail page following Acct. No. 61	$285,503		
7.	Sleepers and Diners	90,566	31.72	273
8.	Mail and Express	35,324	12.37	106
9.	Passengers and Baggage	159,613	55.91	481
10.	Michigan Passengers and Baggage, Line 9		100.00	481
11.	Divided on Michigan Passenger Miles, Ratio No. 10:			
12.	Interstate		35.31	170
13.	Intrastate		64.69	311

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 103, Injuries to Persons.

			%	$
1.	System Total, per Annual Report, $19,981; allocated to Michigan by Delf.			17,040
2.	Allocated to Services by Delf and to Mineral Range by us:			
3.	Freight			12,250
4.	Common Freight and Passenger			774
5.	Passenger—Mineral Range			500
6.	Passenger—D., S. S. & A.			3,516
7.	Michigan Common, Line 4		100.00	774
8.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 62 to 91 inclusive, 99 and 100 (see detail page following Account No. 61)	$1,023,263		
9.	Freight	737,760	72.10	558
10.	Passenger	285,503	27.90	216
11.	Michigan Freight Recap.:			
12.	Exclusive, Line 3			12,250
13.	Common, Line 9			558
14.	Total Michigan Freight			12,808
15.	Michigan Passenger Recap.:			
16.	Exclusive, Line 6			3,516
17.	Common, Line 10			216
18.	Total Michigan Passenger			3,732
19.	Michigan Passenger, Line 18		100.00	3,732
20.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 62 to 91 inclusive, 99 and 100 (see detail page following Account No. 61)	$285,503		
21.	Sleepers and Diners	90,566	31.72	1,184
22.	Mail and Express	35,324	12.37	462
23.	Passengers and Baggage	159,613	55.91	2,086
24.	Michigan Passengers and Baggage, Line 23		100.00	2,086
25.	Divided on Michigan Passenger Miles, Ratio No. 10:			
26.	Interstate		35.31	737
27.	Intrastate		64.69	1,349

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 10¼, Operating Joint Tracks and Facilities—Dr.

			%	$
1.	System Total, per Annual Report, $2,541; allocated to Michigan by Delf.			714
2.	Allocated to Services by Delf:			
3.	Freight			551
4.	Common Freight and Passenger			67
5.	Passenger (Soo Bridge)			96
6.	Michigan Common, Line 4		100.00	67
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 62 to 91 inclusive, 99 and 100 (see detail page following Account No. 61)	$1,023,263		
8.	Freight	737,760	72.10	48
9.	Passenger	285,503	27.90	19
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			551
12.	Common, Line 8			48
13.	Total Michigan Freight			599
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			96
16.	Common, Line 9			19
17.	Total Michigan Passenger			115
18.	Michigan Passenger, Line 17			115
19.	Allocated to Interstate Pass. and Baggage Account of Soo Bridge			96
20.	Balance			19

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 10½, Operating Joint Tracks and Facilities—Dr.—(Continued)

21.	Michigan Passenger, other than Soo Bridge, Line 20		100.00	19
22.	Divided relatively with the total of charges to Michigan Passenger Services, in Accounts 62 to 91 inclusive, 99 and 100 (see detail page following Account No. 61)	$285,503		
23.	Sleepers and Diners	90,566	31.72	6
24.	Mail and Express	35,324	12.37	2
25.	Passengers and Baggage	159,613	55.91	11
26.	Michigan Passengers and Baggage, other than Soo Bridge, Line 25		100.00	11
27.	Divided on Michigan Passenger Miles, Ratio No. 10:			
28.	Interstate		35.31	4
29.	Intrastate		64.69	7
30.	Michigan Interstate Passengers and Baggage Recap.:			
31.	Soo Bridge, Line 19			96
32.	Other, Line 28			4
33.	Total Michigan Interstate Pass. and Baggage			100

NOTE:—Station Supplies and Crossing Gates make up the Michigan Common Portion of this charge.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 105, Operating Joint Tracks and Facilities—Cr.

			%	$
1.	System Total, per Annual Report, $4,981;* allocated to Michigan by us			3,563*
2.	Allocated to Services:			
3.	Freight			2,106*
4.	Common Freight and Passenger			649*
5.	Passenger			808*
6.	Michigan Common, Line 4		100.00	649*
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 62 to 91 inclusive, 99 and 100 (see detail page following Account No. 61)	$1,023,263		
8.	Freight	737,760	72.10	468*
9.	Passenger	285,503	27.90	181*
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			2,106*
12.	Common, Line 8			468*
13.	Total Michigan Freight			2,574*
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			808*
16.	Common, Line 9			181*
17.	Total Michigan Passenger			989*

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 105, Operating Joint Tracks and Facilities—Cr.—(Continued).

			%	$
18.	Michigan Passenger, Line 17		100.00	989*
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 62 to 91 inclusive, 99 and 100 (see detail page following Account No. 61)	$285,503		
20.	Sleepers and Diners	90,566	31.72	314*
21.	Mail and Express	35,324	12.37	122*
22.	Passengers and Baggage	159,613	55.91	553*
23.	Michigan Passengers and Baggage, Line 22		100.00	553*
24.	Divided on Michigan Passenger Miles, Ratio No. 10:			
25.	Interstate		35.31	195*
26.	Intrastate		64.69	358*

NOTE:—The Michigan Common portion of this charge is made up of the following:

Station Supplies and Expenses	$326.93*
Station Services, Chassell Agent	$120.00*
Water Tank, Michigamme	$202.24*
Total Common	$649.17*

*NOTE:—Typewritten in red.

V. GENERAL

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

V. GENERAL.
No. 106, Salaries and Expenses of General Officers.
No. 107, Salaries and Expenses of Clerks and Attendants.
No. 108, General Office Supplies and Expenses.

				No. 106	No. 107	No. 108
			%	$	$	$
1.	System Total, per Annual Report		100.00	24,949	38,681	3,741
2.	Divided relatively with the total of charges to Michigan and Outside of Michigan in General Accounts I, II, III and IV (see detail page following)	$2,609,265				
3.	Outside Michigan	431,435	16.53	4,124	6,394	618
4.	Michigan	2,177,830	83.47	20,825	32,287	3,123
5.	Michigan Total, Line 4		100.00	20,825	32,287	3,123
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III and IV (see detail page following)	$2,177,830				
7.	Freight	1,592,994	73.15	15,233	23,618	2,284
8.	Passenger	584,836	26.85	5,592	8,669	839
9.	Michigan Passenger, Line 8		100.00	5,592	8,669	839
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III and IV (see detail page following)	$584,836				
11.	Sleepers and Diners	170,814	29.21	1,633	2,532	245
12.	Mail and Express	74,569	12.75	713	1,105	107
13.	Pass. and Baggage	339,453	58.04	3,246	5,032	487

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

V. GENERAL—(Continued).

				No. 106	No. 107	No. 108
			%	$	$	$
14.	Michigan Passengers and Baggage, Line 13		100.00	3,246	5,032	487
15.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III and IV (see detail page following)	$339,453				
16.	Interstate	134,483	39.62	1,286	1,994	193
17.	Intrastate	204,970	60.38	1,960	3,038	294

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Details for Dividing Accounts 106, 107, 108, 109, 110, 112, 113, 114, 116 and "Valuation Expenses."

	System		MICHIGAN (Excluding Mineral Range)							
					PASSENGERS					
	Total, Excluding Mineral Range	Outside Michigan	Total	Freight	Total	Sleepers & Diners	Mail & Express	Passengers and Baggage Total	Interstate	Intrastate
	$	$	$	$	$	$	$	$	$	$
I.	794,986	138,688	656,298	502,622	153,676	57,625	21,275	74,776	26,417	48,359
II.	427,161	69,269	357,892	271,227	86,665	18,615	16,387	51,663	18,242	33,421
III.	105,707	17,640	88,067	41,852	46,215			46,215	30,865	15,350
IV.	1,281,411	205,838	1,075,573	777,293	298,280	94,574	36,907	166,799	58,959	107,840
	2,609,265	431,435	2,177,830	1,592,994	584,836	170,814	74,569	339,453	134,483	204,970

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 109, Law Expenses.

			%	$
1.	System Total, per Annual Report			42,041
2.	Less cost of this suit			32,092
3.	Balance			9,949
4.	System Total, other than cost of suit, Line 3		100.00	9,949
5.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III and IV (see detail page following Account 106)	$2,609,265		
6.	Outside Michigan	431,435	16.53	1,645
7.	Michigan	2,177,830	83.47	8,304
8.	Michigan Total, Line 7		100.00	8,304
9.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV (see detail page following Account No. 106)	$2,177,830		
10.	Freight	1,592,994	73.15	6,074
11.	Passenger	584,836	26.85	2,230
12.	Michigan Passenger, Line 11		100.00	2,230
13.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III and IV (see detail page following Account No. 106)	$584,836		
14.	Sleepers and Diners	170,814	29.21	651
15	Mail and Express	74,569	12.75	285
16.	Passengers and Baggage	339,453	58.04	1,294
17.	Michigan Passengers and Baggage, Line 16		100.00	1,294
18.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III and IV (see detail page following Account No. 106)	$339,453		
19.	Interstate	134,483	39.62	513
20.	Intrastate	204,970	60.38	781

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 110, Insurance.

1.	System Total, per Annual Report, $10,592; allocated to Michigan by Delf.		%	$ 9,233
2.	Allocated to Services by Delf:			
3.	Freight			4,536
4.	Common Freight and Passenger			4,286
5.	Passenger			411
6.	Michigan Common, Line 4		100.00	4,286
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III and IV (see detail page following Account No. 106)	$2,177,830		
8.	Freight	1,592,994	73.15	3,135
9.	Passenger	584,836	26.85	1,151
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			4,536
12.	Common, Line 8			3,135
13.	Total Michigan Freight			7,671
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			411
16.	Common, Line 9			1,151
17.	Total Michigan Passenger			1,562
18.	Michigan Passenger, Line 17		100.00	1,562
19.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III and IV (see Detail page following Account No. 106)	$584,836		
20.	Sleepers and Diners	170,814	29.21	456
21.	Mail and Express	74,569	12.75	199
22.	Passengers and Baggage	339,453	58.04	907
23.	Michigan Passengers and Baggage, Line 22		100.00	907
24.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III and IV (see detail page following Account No. 106)	$339,453		
25.	Interstate	134,483	39.62	359
26.	Intrastate	204,970	60.38	548

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 112, Pensions.

			%	$
1.	System Total, per Annual Report		100.00	720
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III and IV (see detail page following Account No. 106)	$2,609,265		
3.	Outside Michigan	431,435	16.53	119
4.	Michigan	2,177,830	83.47	601
5.	Michigan Total, Line 4		100.00	601
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III and IV (see detail page following Account No. 106)	$2,177,830		
7.	Freight	1,592,994	73.15	440
8.	Passenger	584,836	26.85	161
9.	Michigan Passenger, Line 8		100.00	161
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III and IV (see detail page following Account No. 106)	$584,836		
11.	Sleepers and Diners	170,814	29.21	47
12.	Mail and Express	74,569	12.75	21
13.	Passengers and Baggage	339,453	58.04	93
14.	Michigan Passengers and Baggage, Line 13		100.00	93
15.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III and IV (see detail page following Account No. 106)	$339,453		
16.	Interstate	134,483	39.62	37
17.	Intrastate	204,970	60.38	56

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 113, Stationery and Printing.
No. 114, Other Expenses.

				No. 113	No. 11
			%	$	$
1.	System Total, per Annual Report		100.00	5,033	3,20
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III and IV (see detail page following Account No. 106)	$2,609,265			
3.	Outside Michigan	431,435	16.53	832	5
4.	Michigan	2,177,830	83.47	4,201	2,7
5.	Michigan Total, Line 4		100.00	4,201	2,7
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III and IV (see detail page following Account No. 106)	$2,177,830			
7.	Freight	1,592,994	73.15	3,073	1,9
8.	Passenger	584,836	26.85	1,128	7
9.	Michigan Passenger, Line 8		100.00	1,128	7
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III and IV (see detail page following Account No. 106)	$584,836			
11.	Sleepers and Diners	170,814	29.21	329	2
12.	Mail and Express	74,569	12.75	144	
13.	Passengers and Baggage	339,453	58.04	655	4

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 113, Stationery and Printing.
No. 114, Other Expenses.
(Continued).

			No. 113	No. 114
		%	$	$
4. Michigan Passengers and Baggage, Line 13		100.00	655	425
5. Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III and IV (see detail page following Account No. 106)	$339,453			
6. Interstate	134,483	39.62	260	168
7. Intrastate	204,970	60.38	395	257

PAGE CUT OFF

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 115, General Administration of Joint Tracks, Yards and Terminals—Dr.

		%	$
1.	System Total, per Annual Report, $555; allocated to Michigan by Delf.		151
2.	Allocated to Services by Delf:		
3.	Freight		59
4.	Passenger (all Passengers and Baggage)		92
5.	Michigan Passengers and Baggage, Line 4		92
6.	Allocated to Interstate, Account of Soo Bridge		13
7.	Balance		79
8.	Michigan Passengers and Baggage, other than Soo Bridge, Line 7	100.00	79
9.	Divided on Michigan Passenger Miles, Ratio No. 10:		
10.	Interstate	35.31	28
11.	Intrastate	64.69	51
12.	Michigan Interstate Passengers and Baggage Recap.:		
13.	Soo Bridge, Line 6		13
14.	Other, Line 10		28
15.	Total Mich. Interstate Pass. and Baggage		41

NOTE:—The Michigan Passenger portion of this charge is made up of the following:

Soo Bridge	$13
Soo Union Depot	79
Total Michigan Passenger	$92

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

No. 116, General Administration of Joint Tracks, Yards and Terminals—Cr.

			%	$
1.	System Total, per Annual Report, $197;* allocated to Michigan by Delf.		100.00	197*
2.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III and IV (see detail page following Account No. 106)	$2,177,830		
3.	Freight	1,592,994	73.15	144*
4.	Passenger	584,836	26.85	53*
5.	Michigan Passenger, Line 4		100.00	53*
6.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III and IV (see detail page following Account No. 106)	$584,836		
7.	Sleepers and Diners	170,814	29.21	15*
8.	Mail and Express	74,569	12.75	7*
9.	Passengers and Baggage	339,453	58.04	31*
10.	Michigan Passengers and Baggage, Line 9		100.00	31*
11.	Divided relatively wth the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III and IV (see detail page following Account No. 106)	$339,453		
12.	Interstate	134,483	39.62	12*
13.	Intrastate	204,970	60.38	19*

NOTE:—This charge is made up of Joint Insurance at the Soo.

*NOTE:—Typewritten in red.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Valuation Expenses.

			%	$
1.	System Total, per Annual Report		100.00	8,208
2.	Divided relatively with the total mileage of all D., S. S. & A. tracks in and outside of Michigan	771.51		
3.	Outside Michigan	131.49	17.04	1,399
4.	Michigan	640.02	82.96	6,809
5.	Michigan Total, Line 4		100.00	6,809
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III and IV (see detail page following Account No. 106)	$2,177,830		
7.	Freight	1,592,994	73.15	4,981
8.	Passenger	584,836	26.85	1,828
9.	Michigan Passenger, Line 8		100.00	1,828
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III and IV (see detail page following Account No. 106)	$584,836		
11.	Sleepers and Diners	170,814	29.21	534
12.	Mail and Express	74,569	12.75	233
13.	Passengers and Baggage	339,453	58.04	1,061
14.	Michigan Passengers and Baggage, Line 13		100.00	1,061
15.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III and IV (see detail page following Account No. 106)	$339,453		
16.	Interstate	134,483	39.62	420
17.	Intrastate	204,970	60.38	641

Sleeping Car Service—Expenses.

	System	Michigan
	$	$
Sleeping Cars—Repairs	5,454.97	
Sleeping Cars—Depreciation	2,683.66	
Conducting Sleeping Cars	15,808.21	
General Expenses	199.85	
TOTAL	24,146.69	18,539.83

Dining and Special Car Service—Expenses.

Dining and Special Cars—Repairs	3,850.21	
Dining and Special Cars—Renewals	23.16*	
Dining and Special Cars—Depreciation	2,465.40	
Conducting Dining and Special Cars	47,431.91	
General Expenses	543.27	
TOTAL	54,267.63	44,076.17

*NOTE:—Typewritten in red.

These accounts in this year were designated as "Outside Operations" and charged to Income Account, but are here shown and included in total operating expenses for convenience of comparison with subsequent years.

Apportionments of Primary Expense Accounts

SUMMARY

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Summary of Apportionment of Primary Expense Accounts.

Account	System Total	MICHIGAN								
		Total	Freight	Mineral Range Passenger	D. S. S. & A. Passenger					
					Total	Sleepers & Diners	Mail & Express	Passengers & Baggage		
								Total	Interstate	Intrastate
	$	$	$	$	$	$	$	$	$	$
I. Maintenance of Way and Structures:										
1. Superintendence	23,233	19,128	14,445		4,683	1,756	649	2,278	804	1,474
2. Ballast	20,376	20,198	15,066		5,132	2,041	703	2,388	843	1,545
3. Ties	117,364	91,620	68,337		23,283	9,260	3,190	10,833	3,825	7,008
4. Rails	50,034	48,268	36,001		12,267	4,878	1,681	5,708	2,015	3,693
5. Other Track Material	30,509	27,132	20,237		6,895	2,742	945	3,208	1,133	2,075
6. Roadway and Track	332,089	276,353	208,052		68,301	26,087	9,453	32,761	11,568	21,193
7. Removal of Snow, Sand & Ice	20,071	18,450	14,959		3,491	1,025	511	1,955	690	1,265
9. Bridges, Trestles & Culverts	76,702	45,886	34,636		11,250	3,304	1,646	6,300	2,225	4,075
10. Over and under Grade Crossings	74	74	74							
11. Gr. Crosgs, Fenc's, Cat. Gds. & Signs	9,795	8,758	6,881		1,877	551	275	1,051	371	680
12. Snow & Sand Fences & Snow Sheds	1,051	1,021	802		219	64	32	123	43	80
13. Signals & Interlocking Plants	442	180	171		9	3	1	5	2	3
14. Telegraph & Telephone Lines	3,340	2,847	2,193		654	192	96	366	129	237
16. Buildings, Fixtures & Grounds	62,160	52,621	37,891		14,730	5,438	1,982	7,310	2,581	4,729
17. Docks and Wharves	34,364	34,364	33,479		885	293	114	478	169	309
18. Roadway Tools & Supplies	9,526	7,843	5,923		1,920	720	266	934	330	604
19. Injuries to Persons	3,530	2,734	2,069		665	249	92	324	114	210
20. Stationery and Printing	853	702	530		172	64	24	84	30	54
21. Other Expenses	167	137	103		34	13	5	16	6	10
22. Maint'g Jt. Tks., Yds. & oth fac.—Dr.	9,462	8,138	7,299		839	306	113	420	163	257
23. Maint'g Jt. Tks., Yds. & oth fac.—Cr.	10,156*	10,156*	6,523		3,630*	1,361*	503*	1,766*	624*	1,142*
Total Maint. of Way & Structures	794,986	656,298	502,622		153,676	57,625	21,275	74,776	26,417	48,359

**Note*—Typewritten in red.

THIS PAGE BOUND

Account	System Total	MICHIGAN								
		Total	Freight	Mineral Range Passenger	D. S. S. & A. Passenger					
					Total	Sleepers & Diners	Mail & Express	Passengers & Baggage		
								Total	Interstate	Intrastate
II. Maintenance of Equipment:										
	$	$	$	$	$	$	$	$	$	$
24. Superintendence	12,662	10,617	7,438	124	3,055	871	526	1,658	585	1,073
25. Steam Locomotives—Repairs	113,758	95,638	60,658	1,173	33,807	13,658	4,646	15,503	5,474	10,029
26. Steam Locomotives—Renewals	206*	151*	154*		7*	4*		3*	1*	2*
27. Steam Locomotives—Depreciation	24,560	20,870	14,536	421	5,913	2,389	810	2,714	958	1,756
31. Pass. Train Cars—Repairs	41,855	35,083		1,946	33,137		8,215	24,922	8,800	16,122
33. Pass. Train Cars—Depreciation	7,199	6,034		335	5,699		1,413	4,286	1,513	2,773
34. Frt. Train Cars—Repairs	141,008	118,672	118,672							
35. Frt. Train Cars—Renewals	698	588	588							
36. Frt. Train Cars—Depreciation	65,205	54,876	54,876							
43. Work Equipment—Repairs	10,784	8,856	6,717		2,139	804	297	1,038	367	671
45. Work Equipment—Depreciation	3,469	2,849	2,161		688	258	96	334	118	216
46. Shop Machinery and Tools	7,071	5,929	4,203		1,726	492	297	937	331	606
48. Injuiries to Persons	966	881	713		168	48	29	91	32	59
49. Stationery and Printing	1,303	1,093	775		318	91	55	172	61	111
50. Other Expenses	25	21	15		6	2	1	3	1	2
51. Maintaining Jt. Equip. at Termls.—Dr.	803	35	19		16	6	2	8	3	5
Total Maintenance of Equipment	431,160	361,891	271,227	3,999	86,665	18,615	16,387	51,663	18,242	33,421
III. Traffic:										
53. Superintendence	31,901	26,441	14,584		11,857			11,857	4,187	7,670
54. Outside Agencies	44,617	37,009	13,856		23,153			23,153	21,308	1,845
55. Advertising	5,046	4,193	7		4,186			4,186	2,891	1,295
56. Traffic Associations	297	245	245							
57. Fast Freight Lines	660	546	546							
58. Industrial & Immigation Bureaus	11,056	9,583	6,066		3,517			3,517	1,242	2,275
59. Stationery and Printing	12,130	10,050	6,548		3,502			3,502	1,237	2,265
Total Traffic	105,707	88,067	41,852		46,215			46,215	30,865	15,350

*Note—Typewritten in red.

Account	System Total	MICHIGAN			D. S. S. & A. Passenger					
		Total	Freight	Mineral Range Passenger	Total	Sleepers & Diners	Mail & Express	—Passengers & Baggage— Total	Inter-state	Intra-state
	$	$	$	$	$	$	$	$	$	$
IV. Transportation:										
61. Superintendence	21,998	18,513	13,735	174	4,604	1,446	583	2,575	909	1,666
62. Dispatching Trains	16,585	14,137	10,887		3,250	955	475	1,820	643	1,177
63. Station Employees	166,606	147,375	127,019		20,356		2,036	18,320	6,469	11,851
64. Weighing & Car Service Assns.	1,793	1,483	1,483							
65. Coal and Ore Docks	21,704	21,704	21,704							
66. Station Supplies & Expenses	12,272	10,856	9,357		1,499			1,499	529	970
67. Yard Masters & their Clerks	4,659	4,659	4,511		148	76	7	65	23	42
68. Yard Conductors & Brakemen	47,655	47,655	46,140		1,515	773	73	669	236	433
69. Yard Switch & Signal Tenders	4,052	4,052	3,923		129	66	6	57	20	37
70. Yard Supplies & Expenses	1,312	1,312	1,270		42	21	2	19	7	12
71. Yard Enginemen	27,328	27,328	26,459		869	443	42	384	136	248
72. Enginehouse Expenses—Yard	14,310	14,310	13,902		408	208	20	180	64	116
73. Fuel for Yard Locomotives	22,745	22,745	22,022		723	369	35	319	113	206
74. Water for Yard Locomotives	1,520	1,520	1,472		48	25	2	21	7	14
75. Lubricants for Yard Locomotives	280	280	271		9	5		4	1	3
76. Other Supplies for Yard Locos.	425	425	411		14	7	1	6	2	4
77. Operat'g Jt. Yds. & Termls.—Dr.	42,671	18,595	12,103		6,492	2,623	897	2,972	1,049	1,923
78. Operat'g Jt. Yds. & Termls.—Cr.	14,341*	14,341*	12,352*		1,989*	804*	275*	910*	321*	589*
80. Road Enginemen	180,007	149,486	89,040	3,033	57,413	23,200	7,929	26,284	9,281	17,003
81. Enginehouse Expenses—Road	51,807	42,917	25,021		17,896	7,232	2,471	8,193	2,893	5,300
82. Fuel for Road Locomotives	323,794	268,338	176,328	4,612	87,398	35,318	12,070	40,010	14,128	25,882
83. Water for Road Locomotives	18,773	15,557	10,223	267	5,067	2,048	700	2,319	819	1,500
84. Lubricants for Road Locos.	4,328	3,587	2,357	62	1,168	472	161	535	189	346
85. Other Supplies for Road Locos.	5,654	4,678	3,413	73	1,192	482	165	545	192	353
88. Road Trainmen	214,038	177,746	119,299	3,025	55,422	9,218	4,600	41,604	14,690	26,914
89. Train Supplies & Expenses	40,664	34,000	6,927	1,401	25,672	7,707	3,846	14,119	4,985	9,134
90. Interl'ck'rs, Blk. & oth. Sgnls.—Oprtn	1,277	24	23		1			1		1
91. Crossing Flagmen & Gatemen	8,362	7,922	7,507		415	122	61	232	82	150

*Note—Typewritten in red.

Account	System Total	MICHIGAN								
		Total	Freight	Mineral Range Passenger	D. S. S. & A. Passenger					
					Total	Sleepers & Diners	Mail & Express	—Passengers & Baggage— Total	Interstate	Intrastate
	$	$	$	$	$	$	$	$	$	$
IV. Transportation. (Continued)										
93. Clearing Wrecks	4,100	3,045	2,166		879	279	109	491	173	318
94. Telephon & Telgraph—Operation	143	120	87		33	11	4	18	6	12
97. Stationery & Printing	12,432	10,455	7,538		2,917	925	361	1,631	576	1,055
98. Other Expenses	1,067	916	799		117	37	15	65	23	42
99. Loss and Damage—Freight	8,513	7,040	7,040							
100. Loss and Damage—Baggage	667	346			346			346	122	224
101. Damage to Property	6,815	4,810	4,301		509	161	63	285	101	184
102. Damage to Stock on Rt.-of-Way	1,002	934	71		860	273	106	481	170	311
103. Injuries to Persons	19,981	17,040	12,803	500	3,732	1,184	462	2,086	737	1,349
104. Operating Joint Tracks—Dr.	2,541	714	599		115	6	2	107	100	7
105. Operating Joint Tracks—Cr.	4,981*	3,563*	2,574*		989*	314*	122*	553*	195*	358*
Total Transportation	1,294,558	1,088,720	777,293	13,147	298,280	94,574	36,907	166,799	58,959	107,840
V. General:										
106. Salaries & Exp. of General Officers	24,949	20,825	15,233		5,592	1,633	713	3,246	1,286	1,960
107. Sal. & Exp. of Clerks & Attendants	38,681	32,287	23,618		8,669	2,532	1,105	5,032	1,994	3,038
108. Gen. Office Supplies & Exp.	3,741	3,123	2,284		839	245	107	487	193	294
109. Law Expense	9,949 (a)	8,304	6,074		2,230	651	285	1,294	513	781
110. Insurance	10,592	9,233	7,671		1,562	456	199	907	359	548
112. Pensions	720	601	440		161	47	21	93	37	56
113. Stationery & Printing	5,033	4,201	3,073		1,128	329	144	655	260	395
114. Other Expenses	3,266	2,726	1,994		732	214	93	425	168	257
115. Gen. Admin. Jt. Trks. & Term.—Dr.	555	151	59		92			92	41	51
116. Gen. Admin. Jt. Trks. & Term.—Cr.	197*	197*	141*		53*	15*	7*	31*	12*	19*
Valuation Expenses	8,208	6,809	4,981		1,828	534	233	1,061	420	641
Total General	105,497	88,063	65,283		22,780	6,626	2,893	13,261	5,259	8,002

Note—Typewritten in red.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Account	System Total	MICHIGAN								
		Total	Freight	Mineral Range Passenger	D. S. S. & A. Passenger					
					Total	Sleepers & Diners	Mail & Express	Passengers & Baggage		
								Total	Interstate	Intrastate
	$	$	$	$	$	$	$	$	$	$
Recapitulation:										
I. Maintenance of Way & Struc.	794,986	656,298	502,622		153,676	57,625	21,275	74,776	26,417	48,359
II. Maintenance of Equipment	421,160	361,891	271,227	3,999	86,665	18,615	16,387	51,663	18,242	33,421
III. Traffic	105,707	88,067	41,852		46,215			46,215	30,865	15,350
IV. Transportation	1,294,558	1,088,720	777,293	13,147	298,280	94,574	36,907	166,799	58,959	107,840
V. General	105,497	88,063	65,283		22,780	6,626	2,893	13,261	5,259	8,002
	2,731,908	2,283,039	1,658,277	17,146	607,616	177,440	77,462	352,714	139,742	212,972
Sleeping Car Service	24,147	18,540			18,540	18,540				
Dining Car Service	54,268	44,076			44,076	44,076				
GRAND TOTAL	2,810,323	2,345,655	1,658,277	17,146	670,232	240,056	77,462	352,714	139,742	212,972

(a) This amount excludes, on account of cost of this suit, $32,092.

Apportionments of Revenues

DETAILS AND SUMMARY

Fiscal Year 1914.

Summary of Railway Operating Revenue Accounts.

Account	System Total	MICHIGAN								
		Total	Freight	Mineral Range	D. S. S. & A. Passenger					
					Total	Sleepers & Diners	Mail & Express	Passengers & Baggage	Interstate	Intrastate
Railway Operating Revenue:	$	$	$	$	$	$	$	$	$	$
1. Freight Revenue	2,091,597	1,818,061	1,818,061							
2. Passenger	1,014,471	954,037			954,037			954,037	334,103	619,934
3. Excess Baggage	9,101	8,411			8,411			8,411	2,567	5,844
5. Mail Revenue	67,507	54,434			54,434		54,434			
6. Express Revenue	32,572	29,659			29,659		29,659			
7. Milk Revenue	549	316			316			316		316
8. Other Passenger Train	7,755	7,157		737	6,420			6,420	2,393	4,027
9. Switching Revenue	15,788	8,615	8,615							
10. Special Service Train	3,044	2,437	1,362		1,075			1,075	25	1,050
11. Miscellanous Transportation	3,742	3,504	3,504							
12. Station & Train Privileges	600	498			498			498	174	324
13. Parcel Room Receipts	79	79			79			79	28	51
14. Storage—Freight	306	301	301							
15. Storage—Baggage	66	66			66			66	23	43
16. Car Service	5,914	5,720	5,720							
17. Telegraph & Telephone Service	598	583	373		210			210	74	136
18. Rents of Bldgs. & Other Prop.	10,177	9,826	8,762		1,064			1,064	373	691
19. Miscellaneous	48,621	48,519	47,336		1,183			1,183	414	769
20. Joint Facilities—Dr.	697*	697*	408*		289*			289*	101*	188*
21. Joint Facilities—Cr.	9,094	2,942	1,872		1,070			1,070	425	645
	3,410,884	2,954,468	1,895,498	737	1,058,233		84,093	974,140	340,498	633,642
Sleeping Cars—Revenue	40,017	30,482			30,482	30,482				
Dining Cars—Revenue	43,052	34,966			34,966	34,966				
TOTAL Revenues	3,493,953	3,019,916	1,895,498	737	1,123,681	65,448	84,093	974,140	340,498	633,642

Note.

ACCOUNT 8—Of the Total Michigan Portion, $5,475 is on account of CM&STP trains for the full year's operation. This is credited as follows:

25% to DSS&A on account Maintenance of Way	$1,369
75% to Train Movement, of which 14/78 credited to Mineral Range	737
64/78 credited to DSS&A	3,369

ACCOUNT 18—Excludes $1,691 claimed to be from non-operated property not inventoried. (See Delf Exhibits)

INCOME ACCOUNT

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

The presentation of the following computations of income is not intended to waive the claim that the passenger earnings of the Mackinaw Transportation Company are to be added to the net corporate income of the passenger business, particularly if sleeping car and dining car operations are to be included.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Joint Facilities—Income Cr.

MICHIGAN.

	Michigan Total	Michigan Freight	Michigan Passenger	Michigan Common
	$	$	$	$
Main Line—Ishpeming to Marquette	1,047.11		1,047.11	
Main Line—Negaunee to Calumet	6,528.97		6,528.97	
Main Line—Houghton to Pilgrim M. R. Frts.	1,215.32			1,215.32
Mine Yard Tracks, L. S. & I. Switch Engine	1,334.40	1,334.40		
Coal Dock Tracks, Marquette	11.25	11.25		
Land Negaunee, Passenger Station	150.00		150.00	
Union Depot Tracks, Negaunee	57.01			57.01
Enginehouse, Houghton	47.20	47.20		
Yard Tracks, Sault Ste. Marie	581.10			581.10
	10,972.36	1,392.85	7,726.08	1,853.43
Common to Frt. (64.02%), Pass. (35.98%)		1,186.57	666.86	
	10,972.36	2,579.42	8,392.94	
Negaunee to Calumet and return to Ishpeming. D., S. S. & A. 163 miles, Mineral Range 28=28/191 to Mineral Range, Total $6,528.97	957.13		957.13	
	10,015.23	2,579.42	7,435.81	
Passenger to Intrastate 64.98%			4,831.79	
Passenger to Interstate 35.02%			2,604.02	

Fiscal Year 1914.

Hire of Equipment.

	System Total	Michigan	Michigan Freight	Michigan Passengers	Passengers and Baggage	Sleepers and Diners
Equipment Leased to Others:	$	$	$	$	$	$
Locomotives to Soo Bridge Switching Account(a)	7,320.00	6,188.33	5,193.87	994.46	994.46	
Various Companies	2,198.48	1,796.16	1,796.16			
Cars to L. S. Term. and Transp. Co.	1.00	.82	.82			
Fiborn Quarry	3.00	2.45	2.45			
	9,522.48	7,987.76	6,993.30	994.46	994.46	
Equipment Interchanged, Borrowed:						
Passenger Locomotives	28.00	22.88		22.88	22.88	
Freight Locomotives	41.95	34.27	34.27			
Switch Locomotives	129.48	105.79	105.79			
Passenger Cars	2,212.21	1,807.38		1,807.38	1,807.38	
Passenger Sleepers	1,710.88	1,397.79		1,397.79		1,397.79
Freight Train Cars	201,014.97	164,229.22	164,229.22			
Work Equipment	42.50	34.72	17.52	17.20	17.20	
	205,179.99	167,632.05	164,386.80	3,245.25	1,847.46	1,397.79
Equipment Interchange, Loaned:						
Passenger Locomotives	475.74	388.68		388.68	388.68	
Freight Locomotives	205.73	168.08	168.08			
Switch Locomotivs	79.00	64.54	64.54			
Passenger Train Cars	632.28	516.57		516.57	516.57	
Freight Train Cars	159,024.20	129,922.77	129,922.77			
Work Equipment	181.00	147.88	74.64	73.24	73.24	
	160,597.95	131,208.52	130,230.03	978.49	978.49	
Hire of Equipment—Dr. Balance	35,059.56	28,435.77	27,163.47	1,272.30	125.49*	1,397.79
		Interstate		35.02	43.95*	
		Intrastate		64.98	81.54*	

(a) As used at the Soo by the DSS&A, 83.93 Frt., 16.07 Pass. All other distributions to State and to Passenger and Freight are the same as Mr. Delf's.

**Note*—Typewritten in red.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Taxes—Income Dr.

1.	System Total, per Annual Report, $247,443.			
2.	Michigan Total			226,060
3.	Michigan Taxes assigned to Services relatively with the allocations and assignments of the Michigan Operating Expenses-			
4.	Michigan Total	2,345,655	100.00	226,060
5.	Freight	1,658,277	70.70	159,824
6.	Mineral Range Passenger	17,146	.73	1,650
7.	D., S. S. & A. Passenger	670,232	28.57	64,586
8.	D., S. S. & A. Passenger	670,232	100.00	64,586
9.	Sleepers and Diners	240,056	35.82	23,135
10.	Mail and Express	77,462	11.56	7,466
11.	Passengers and Baggage	352,714	52.62	33,985
12.	Passenger and Baggage	352,714	100.00	33,985
13.	Interstate	139,742	39.62	13,465
14.	Intrastate	212,972	60.38	20,520

The above assignment of Taxes is for temporary use.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1914.

Income Account.

	System Total	MICHIGAN								
		Total	Freight	Mineral Range Passenger	D. S. S. & A. Passenger					
					Total	Sleepers & Diners	Mail & Express	—Passengers & Baggage— Total	Interstate	Intrastate
	$	$	$	$	$	$	$	$	$	$
Railway Operating Revenue	3,493,953	3,019,916	1,895,493	737	1,123,681	65,448	84,093	974,140	340,498	633,642
Railway Operating Expenses	2,810,323	2,345,655	1,658,277	17,146	670,232	240,056	77,462	352,714	139,742	212,972
	683,630	674,261	237,221	16,409*	453,449	174,608*	6,631	621,426	200,756	420,670
Additions:										
Joint Facilities—Cr.(a)	10,972	10,972	2,579	957	7,436			7,436	2,604	4,832
Interest—Cr.	6,104	4,987	3,193		1,794			1,794	628	1,166
TOTAL INCOME	700,706	690,220	242,993	15,452*	462,679	174,608*	6,631	630,656	203,988	426,668
Deductions:										
Hire of Equipment—Dr.(b)	35,060	28,436	27,164		1,272	1,398		126*	44*	82*
Rents Paid, Miscellaneous	101	101	101							
Joint Facilities—Dr.	37,367	9,882	7,503		2,379			2,379	1,343	1,036
Taxes(c)	247,443	226,060	159,824	1,650	64,586	23,135	7,466	33,985	13,465	20,520
	319,971	264,479	194,593	1,650	68,237	24,533	7,466	36,238	14,764	21,474
Net Corporate Income	380,735	425,741	48,401	17,102*	394,442	199,141*	835*	594,418	189,224	405,194

(a) Details on third preceding page.
(b) Details on second page preceding.
(c) Details on first page preceding.

*Note—Typewritten in red.

DULUTH SOUTH SHORE & ATLANTIC

RATE CASE

Cost of Passenger Service,

Fiscal Year 1915.

By C. A. Parker.

RATIOS.

AND OTHER DATA.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

Ratio No. 1—Michigan Gross Ton Miles on Common Tracks.

	Total	Freight	Passenger
Freight:			
Freight Train Cars	247,749,151	247,749,151	
Train Load	181,491,806	181,491,806	
Locomotives	80,645,501	80,645,501	
Yard Switching on Common Tracks	20,332,985	20,332,985	
Train Switching on Common Tracks	9,839,864	9,839,864	
Passenger:			
Passenger Train Cars	166,302,726		166,302,726
Train Loads	7,866,130		7,866,130
Locomotives	83,591,522		83,591,522
Yard Switching on Common Tracks	451,148		451,146
Train Switching on Common Tracks	349,357		349,357
Totals	798,620,190	540,059,307	258,560,883
Percents	100.00	67.62	32.38

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

Ratio No. 1a—Michigan Gross Ton Miles on Common Tracks.

	Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
Passenger train Cars	166,302,726	69,798,012	21,749,669	74,755,045
Train Load	7,866,130		3,525,387	4,340,743
Locomotives (a)	83,591,522	33,503,482	12,129,130	37,985,910
Yard Switching	451,148	287,968	17,505	145,675
Train Switching	349,357		58,226	291,131
Total	258,560,883	103,589,462	37,479,917	117,491,504
Percent	100.00	40.06	14.50	45.44

(a) Apportioned relatively with the ton miles of Passenger train cars and loads as follows:

	Car Ton Miles	Load Ton Miles	Total Ton Miles	Percent	Locomotive Ton miles
Sleepers and Diners	69,798,012		69,798,012	40.08	33,503,482
Mail and Express	21,749,669	3,525,387	25,275,056	14.51	12,129,130
Passengers and Baggage	74,755,045	4,340,743	79,095,788	45.41	37,958,910
Total	166,302,726	7,866,130	174,168,856	100.00	83,591,522

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

Ratio No. 1b—Michigan Gross Ton Miles on Common Tracks. Operated on the D. S. S. & A. by the D. S. S. & A.

	Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
ssenger train Cars	162,864,366	69,478,272	21,772,217	71,613,877
ain Load	7,541,650		3,200,907	4,340,743
comotives (a)	80,995,682	33,021,940	11,873,967	36,099,775
Totals	251,401,698	102,500,212	36,847,091	112,054,395
Percent	100.00	40.77	14.66	44.57

(a) Apportioned relatively with the ton miles of Passenger train cars and loads as llows:

	Car Ton Miles	Load Ton Miles	Total Ton Miles	Percent	Locomotive Ton miles
eepers and Diners	69,478,272		69,478,272	40.77	33,021,940
ail and Express	21,772.217	3,200,907	24,973,124	14.66	11,873,967
assengers and Baggage	71,613,877	4,340,743	75,954,620	44.57	36,099,775
Total	162,864,366	7,541,650	170,406,016	100.00	80,995,682

DULUTH SOUTH SHORE & ATLANTIC RAILWAY.
Fiscal Year 1915.

Ratio No. 2—Michigan Equated Track Miles of Tracks Maintained by the D. S. S. & A.

	Actual Mileage				Equated Mileage			
	Total	Freight	Common	Passenger	Total	Freight	Common	Passenger
Main Line	421.25	12.47	408.78		421.25	12.47	408.78	
Second Track	6.55		6.55		6.55		6.55	
Spurs, Industrial	21.89	21.89			10.94	10.94		
Spurs, Mines	22.21	22.21			11.11	11.11		
Sidings	155.95	113.29	40.56	2.10	77.98	56.65	20.28	1.05
Total	627.85	169.86	455.89	2.10	527.83	91.17	435.61	1.05
Percents					100.00	17.27	82.53	0.20

NOTE:—

The above equation on the following basis:

Main and Second Tracks	1.00
Spurs and Sidings	.50

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

Ratio No. 3—Michigan Passenger Train Car Miles, Including C., M. & St. P. and C. & N. W. Into Marquette.

	Total	Sleepers & Diners	Mail & Express	Passengers and Baggage
Passenger Cars	1,675,964		25,482	1,650,482
Passenger Cars, Special	3,433			3,433
Other Passenger Train Cars	863,350		538,644	324,706
Other Passenger Train Cars, Spl.	406			406
Sleepers, Parlor and Observation, Foreign	210,903	210,903		
Sleepers, Parlor and Observation, Special	239	239		
Diners, Foreign	87,145	87,145		
Sleepers, D. S. S. & A.	527,327	527,327		
Diners, D. S. S. & A.	116,372	116,372		
Observation Diners, D. S. S. & A.	179,976	179,976		
Passenger Cars—C., M. & St. P and C. & N. W.	66,470			66,470
Other Passenger Train Cars—C., M. & St. P. and C. & N. W.	32,623		1,123	31,500
Sleepers, C., M. & St. P. and C. & N. W.	4,380	4,380		
Totals	3,768,588	1,126,342	565,249	2,076,997
Percents	100.00	29.89	15.00	55.11

Ratio No. 3a—Michigan Passenger Train Car Miles, Excluding the C., M. & St. P. and C. & N. W. Into Marquette.

	Car Miles—Michigan			
	Total	Sleepers & Diners	Mail & Express	Passengers and Baggage
Total as above	3,768,588	1,126,342	565,249	2,076,997
Deduct C. M. & St. P. and C. & N. W.	103,473	4,380	1,123	97,970
Totals	3,665,115	1,121,962	564,126	1,979,027
Percents	100.00	30.61	15.39	54.00

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

Ratio No. 3b—Michigan Passenger Train Car Miles, D. S. S. & A. Trains on D. S. S. & A. Tracks, exclusive of Sleepers and Diners.

	Total	Passengers & Baggage	Mail & Express
Passenger Train Cars	1,675,964	25,482	1,650,482
Passenger Train Cars, Special	3,433		3,433
Other Passenger Train Cars	863,350	538,644	324,706
Other Passenger Train Cars, Special	406		406
Total	2,543,153	564,126	1,979,027
Percent	100.00	22.18	77.82

Ratio No. 3c—System Passenger Car Miles (other than Sleepers and Diners) on the D. S. S. & A. and Mineral Range.

	Car Miles	Percent
Michigan DSS&A Cars on DSS&A	2,177,912	77.90
Michigan DSS&A Cars on Mineral Range	137,866	4.93
Outside Michigan DSS&A Cars on DSS&A	480,016	17.17
Total	2,795,794	100.00

Ratio No. 3d—Michigan Passenger Train Car Miles (D. S. S. & A.) Divided to Mail and Express and Passenger and Baggage.

	Car Miles	Percent
Mich. Pass. Train Cars, Pass. and Baggage	1,613,786	74.10
Mich. Pass. Train Cars, Mail and Express	564,126	25.90
Total	2,177,912	100.00

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

Ratio No. 4—Time of Trains and Switching on Common Tracks in Michigan.

	Mileage	Minutes per Mile	Total Time in Minutes	Passenger Time	Freight Time
Passenger Trains	782,641	2.4862	1,945,802	1,945,802	
Freight Trains	659,025	6.0559	3,990,989		3,990,989
Mixed Trains	16,497	2,9227	48,216	9,981	38,235
Special Passenger	417	2.4862	1,037	1,037	
Special Mixed	674	6.0559	4,082	845	3,237
	1,459,254		5,990,126	1,957,665	4,032,461
Deduct for train left on exclusive tracks	3,418	10.	34,180		34,180
	1,455,836		5,955,946	1,957,665	3,998,281
Add Yard Switching on Common Tracks:					
Passenger	3,404	10.	34,040	34,040	
Freight	106,935	10.	1,069,350		1,069,350
Total	1,566,175		7,059,336	1,991,705	5,067,631
Percent			100.00	28.21	71.79

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

Ratio 4a—System Time of Use of Tracks, Passenger and Freight Trains and Yard Switching.

	System Miles	Minutes per Mile	Total Time in Minutes	Passenger Time	Freight Time
Passenger Trains	940,916	2.4862	2,339,395	2,339,395	
Freight Trains	796,075	6.0559	4,820,951		4,820,951
Mixed Trains	16,497	2.9227	48,216	9,981	38,233
Special Passenger	477	2.4862	1,186	1,186	
Special Mixed	783	6.0559	4,742	982	3,760
Passenger Yard Switching	7,288	10.	72,880	72,880	
Freight Yard Switching	208,388	10.	2,083,880		2,083,880
Totals			9,371,250	2,424,424	6,946,826
Percent			100.00	25.87	74.13

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

Ratio No. 10—Michigan Passenger Miles.

	Miles	Percent
Intrastate passengers, one mile	20,342,201	70.29
Interstate passengers, one mile	8,597,088	29.71
Total	28,938,289	100.00

Ratio No. 11a—System Revenue Freight Train Miles.

	Miles	Percent
Michigan Freight Train Miles	672,137	83.06
Outside Mich. Freight Train Miles	137,137	16.94
Total	809,778	100.00

Ratio No. 11b—System Revenue Passenger Train Miles.

	Miles	Percent
Michigan Passenger Train Miles	754,165	82.65
Outside Mich. Passenger Train Miles	158,357	17.35
Total	912,522	100.00

DULUTH SOUTH SHORE & ATLANTIC RAILWAY.
Fiscal Year 1915.

Passenger and Freight Switching in Various Yards in Michigan and Ratios No. 13, No. 13a, No. 13b and No. 13c.

	Switching Miles				Subdivision of Passenger		
	Total	Freight	Passenger	Passenger Percent.	Mail & Express	Sleepers & Diners	Passengers & Baggage
Marquette	107,990	102,736	5,254	4.87	1.92	57.37	40.71
St. Ignace	39,708	37,674	2,034	5.12	12.93	33.09	53.98
Houghton	16,073	16,073					
Ishpeming-Negaunee	51,905	51,905					
Totals	215,676	208,388	7,288	3.38	4.99	50.59	44.42
Train Switching	99,040	96,820	2,220		16.67		83.33
Total all Switching	314,716	305,208	9,508	3.02	7.72	38.78	53.50

		%
Ratio No. 13, Total Switching:	Passenger	3.02
	Freight	96.98
Ratio No. 13a, Yard Switching:	Passenger	3.38
	Freight	96.62
Ratio No. 13b, Yard Switching assigned to Services:		
	Mail and Express	4.99
	Sleepers and Diners	50.59
	Passengers and Baggage	44.42
Ratio No. 13c, All Switching assigned to Services:		
	Mail and Express	7.72
	Sleepers and Diners	38.78
	Passengers and Baggage	53.50

PAGE CUT OFF

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

Ratio No. 17—Allocated Station Pay Roll, Michigan.

	Amount	Percent
Allocated Passenger Employees	10,933.36	15.62
Allocated Freight Employees	58,181.23	84.18
Total	69,114.59	100.00

Ratio No. 17a—Passenger Trainmen's Pay Roll.

	Amount	Percent
Conductors, January and May	5,910,45	53.27
Brakemen, January and May	3,352.25	29.31
Baggagemen, January and May	1,932.45	17.42
Total	11,095.15	100.00

LOCOMOTIVE MILEAGE.

Train and Switching Used in Various Accounts.

	System			Michigan		
	Total	Passenger	Freight	Total	Passenger	Freight
Passenger	932,617	932,617		770,829	770,829	
Freight	836,929		836,929	697,148		697,148
Mixed	16,497	3,415	13,082	16,497	3,415	13,082
Special Passenger	575	575		473	473	
Special Mixed	936	194	742	827	171	656
	1,767,554	936,801	850,753	1,485,774	774,888	710,886
Switching:						
Train Pass'ger	2,220	2,220		2,220	2,220	
Train Freight	117,263		117,263	96,820		96,820
Yard Pass'ger	7,288	7,288		7,288	7,288	
Yard Freight	208,388		208,388	208,388		208,388
	335,159	9,508	325,651	314,716	9,508	305,208
M. R. Passenger	42,577	42,577		42,577	42,577	
C.&N.W. Pass.	10,950	10,950		10,950	10,950	
C.M.&St.P. Pass.	21,498	21,498		21,498	21,498	
	32,448	32,448		32,448	32,448	

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

TRAIN MILEAGE AND TRAIN SWITCHING.

Used in Various Accounts.

	System			Michigan		
	Total	Passenger	Freight	Total	Passenger	Freight
Trains:						
Passenger	908,468	908,468		750,193	750,193	
Freight	796,075		796,075	659,025		659,025
Mixed	16,497	3,415	13,082	16,497	3,415	13,082
Special:						
Passenger	477	477		417	417	
Mixed	783	162	621	674	140	534
	1,772,300	912,522	809,778	1,426,806	754,165	672,641
Train Switching:						
Passenger	2,220	2,220		2,220	2,220	
Freight	117,263		117,263	96,820		96,820
	119,483	2,220	117,263	99,040	2,220	96,820
M. R. Passenger	42,577	42,577		42,577	42,577	
C.M.&St.P. Pass.	21,498	21,498		21,498	21,498	
C.&N.W. Pass.	10,950	10,950		10,950	10,950	
	32,448	32,448		32,448	32,448	
Light Locomotive Miles	44,783	14,912	29,871	38,786	11,399	27,387
Light Locomotive Miles, Special	212	44	168	170	35	135
Total	44,995	14,956	30,039	38,956	11,434	27,522

Apportionments of Primary Expense Accounts.

Details.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

The basic figures, as used in the following computations and divisions of expenses, are used at taken from the books and records of the company, without adjustment for the purpose of reducing them to those necessary for a normal year of operation, and are subject to adjustments to be made to eliminate expenditures to make good deferred maintenance, and those for additions and betterments, etc.

It is the claim of defendants that the expenses in the Maintenance of Way group of this year were excessive in at least the amount of $20,000.

Accounts against which there are no charges for the year.

Maintenance of Way and Structures:

No. 203 Roadway—Depreciation.
204 Underground Power Tubes.
205 Underground Power Tubes—Depreciation.
206 Tunnels and Subways.
207 Tunnels and Subways—Depreciation.
209 Bridges, Trestles and Culverts—Depreciation.
210 Elevated Structures.
211 Elevated Structures—Depreciation.
213 Ties—Depreciation.
215 Rails—Depreciation.
217 Other Track Material—Depreciaton.
219 Ballast—Depreciation.
222 Right of Way Fences—Depreciation.
224 Snow and Sand Fences and Snowsheds—Depreciation.
226 Crossings and Signs—Depreciation.
228 Station and Office Buildings—Depreciation.
230 Roadway Buildings—Depreciation.
232 Water Stations—Depreciation.
234 Fuel Stations—Depreciation.
236 Shops and Enginehouses—Depreciation.
237 Grain Elevators.
238 Grain Elevators—Depreciation.
239 Storage Warehouses.
240 Storage Warehouses—Depreciation.
242 Wharves and Docks—Depreciation.
245 Gas Producing Plants.
246 Gas Producing Plants—Depreciation.
248 Telegraph and Telephone Lines—Depreciation.
250 Signals and Interlockers—Depreciation.
251 Power Plant Dams, Canals and Pipe Lines.
252 Power Plant Dams, Canals and Pipe Lines—Depreciation.

Maintenance of Way and Structures—*Continued.*

253 Power Plant Buildings.
254 Power Plant Buildings—Depreciation.
255 Power Sub-station Buildings.
256 Power Sub-station Buildings—Depreciation.
257 Power Transmission Systems.
258 Power Transmission Systems—Depreciation.
259 Power Distribution Systems.
260 Power Distribution Systems—Depreciation.
261 Power Line Poles and Fixtures.
262 Power Line Poles and Fixtures—Depreciation.
263 Underground Conduits.
264 Underground Conduits—Depreciation.
265 Miscellaneous Structures.
266 Miscellaneous Structures—Depreciation.
268 Paving—Depreciation.
270 Roadway Machines—Depreciation.

Maintenance of Equipment:

No. 303 Shop Machinery—Depreciation.
304 Power Plant Machinery.
305 Power Plant Machinery—Depreciation.
306 Power Sub-Station Apparatus.
307 Power Sub-Station Apparatus—Depreciation.
311 Other Locomotives—Repairs.
312 Other Locomotives—Depreciation.
313 Other Locomotives—Retirements.
319 Passenger-train Cars—Retirements.
320 Motor Equipment of Cars—Repairs.
321 Motor Equipment of Cars—Depreciation.
322 Motor Equipment of Cars—Retirements.
323 Floating Equipment—Repairs.
324 Floating Equipment—Depreciation.
325 Floating Equipment—Retirements.
329 Miscellaneous Equipment—Repairs.
330 Miscellaneous Equipment—Depreciation.
331 Miscellaneous Equipment—Retirements.
335 Other Expenses.

Traffic Expenses:

No. 359 Other Expenses.

Transportation—Rail Line:

No. 381 Yard Motormen.
383 Yard Switching Power Produced.
384 Yard Switching Power Purchased.
393 Train Motormen.
395 Train Power Produced.
396 Train Power Purchased.
406 Drawbridge Operation.
408 Operating Floating Equipment.
409 Express Service.

Transportation—Water Line:

No. 431 Operation of Vessels.
432 Operation of Terminals.
433 Incidental.

Miscellaneous Operations:

No. 442 Hotels and Restaurants.
443 Grain Elevators.
444 Stock Yards.
445 Producing Power Sold.
446 Other Miscellaneous Operations.

General Expenses:

No. 456 Relief Department Expenses.
462 General Joint Facilities—Cr.

I. Maintenance of Way and Structures.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

I. Maintenance of Way and Structures.

No. 201, Superintendence.

			%	$
1.	System Total, per Annual Report		100.00	22,331
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following)	$517,410		
3.	Outside Michigan	114,925	22.21	4,960
4.	Michigan	402,485	77.79	17,371
5.	Michigan Total, Line 4		100.00	17,371
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following)	$402,485		
7.	Freight	296,716	73.72	12,806
8.	Passenger	105,769	26.28	4,565
9.	Michigan Passenger, Line 8		100.00	4,565
10.	Divided relatively with the total of charges to Michigan Passenger Service in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following)	$105,769		
11.	Sleepers and Diners	38,936	36.81	1,680
12.	Mail and Express	15,381	14.54	664
13.	Passengers and Baggage	51,452	48.65	2,221
14.	Michigan Passengers and Baggage, Line 13		100.00	2,221
15.	Divided on Michigan Passenger miles, Ratio No. 10.			
16.	Interstate		29.71	660
17.	Intrastate		70.29	1,561

DULUTH SOUTH SHORE & ATLANTIC RAILWAY.
Fiscal Year 1915.

Details for dividing Accounts Nos. 201, 267, 269, 271, 273, 274, 275, 276, 277, 278 and 279.

Acct. No.	System Total	Outside Michigan	Michigan					
			Total	Freight	Passenger			
					Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
202	$ 47,209	$ 7,940	$ 39,269	$ 30,048	$ 9,221	$ 2,756	$ 1,383	$ 5,082
208	86,936	47,568	39,368	28,732	10,636	3,179	1,595	5,862
212	95,352	15,959	79,393	58,018	21,375	8,563	3,099	9,713
214	20,682	900	19,782	14,456	5,326	2,134	772	2,420
216	23,469	1,663	21,806	15,935	5,871	2,352	851	2,668
218	10,362	659	9,703	7,091	2,612	1,046	379	1,187
220	178,067	32,519	145,548	106,362	39,186	15,698	5,682	17,806
221	5,616	2,307	3,309	2,532	777	232	117	428
223	244	45	199	152	47	14	7	26
225	1,656	352	1,304	997	307	92	46	169
227	7,089	680	6,409	4,452	1,957		196	1,761
229	1,933	740	1,193	872	321	129	46	146
231	5,065	779	4,286	2,824	1,462	597	213	652
233	2,581	397	2,184	1,439	745	304	109	332
235	3,519	460	3,059	2,112	947	346	144	457
241	884		884	693	191	63	25	103
243	2,091		2,091	2,091				
247	2,857	417	2,440	1,824	616	184	92	340
249	492	294	198	188	10	3	1	6
272	21,306	1,246	20,060	15,898	4,162	1,244	624	2,294
Total	517,410	114,925	402,485	296,716	105,769	38,936	15,381	51,452

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 202—Roadway Maintenance.

		%	$
1.	System Total, per Annual Report, $47,209; allocated to Michigan		39,269
2.	Subdivided into sub-primary accounts.		
3.	Care of roadbed		3,876
4.	General Cleaning		11,439
5.	Watching Roadway		20,852
6.	Track Changes		66
7.	Train Service		2,580
8.	Bank Protection		392
9.	Other Expenses.		64
10.	Michigan Total, Line 1	100.00	39,269
11.	Divided on Michigan Equated Track Miles, Ratio No. 2.		
12.	Freight	17.27	6,782
13.	Common Freight and Passenger	82.53	32,409
14.	Passenger	.20	78
15.	Michigan Common, Line 13	100.00	32,409
16.	Divided on Michigan Time, Ratio No. 4.		
17.	Freight	71.79	23,266
18.	Passenger	28.21	9,143
19.	Michigan Freight Recap.:		
20.	Exclusive, Line 12		6,782
21.	Common, Line 17		23,266
22.	Total Michigan Freight		30,048

No. 202—Roadway Maintenance (Continued).

		%	$
23.	Michigan Passenger Recap.:		
24.	Exclusive, Line 14		78
25.	Common, Line 18		9,143
26.	Total Michigan Passenger		9,221
27.	Michigan Passenger, Line 26	100.00	9,221
28.	Divided on Michigan Total Passenger train car miles, Ratio No. 3.		
29.	Sleepers and Diners	29.89	2,756
30.	Mail and Express	15.00	1,383
31.	Passengers and Baggage	55.11	5,082
32.	Michigan Passengers and Baggage, Line 31	100.00	5,082
33.	Divided on Michigan Passenger miles, Ratio No. 10.		
34.	Interstate	29.71	1,510
35.	Intrastate	70.29	3,572

NOTE—This account corresponds with Group B of Account No. 6 under the old classification.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 208—Bridges, Trestles and Culverts.

			%	$
1.	System Total, per Annual Report, $86,936; allocated to Michigan		100.00	39,368
2.	Divided relatively with 1916 Account	$45,887		
3.	Freight	1,940	4.23	1,665
4.	Common Freight and Passenger	43,947	95.77	37,703
5.	Michigan Common, Line 4		100.00	37,703
6.	Divided on Michigan Time, Ratio No. 4.			
7.	Freight		71.79	27,067
8.	Passenger		28.21	10,636
9.	Michigan Freight Recap.:			
10.	Exclusive, Line 3			1,665
11.	Common, Line 7			27,067
12.	Total Michigan Freight			28,732
13.	Michigan Passenger, Line 8		100.00	10,636
14.	Divided on Michigan Total Passenger train car miles, Ratio No. 3.			
15.	Sleepers and Diners		29.89	3,179
16.	Mail and Express		15.00	1,595
17.	Passengers and Baggage		55.11	5,862
18.	Michigan Passengers and Baggage, Line 17		100.00	5,862
19.	Divided on Michigan Passenger miles, Ratio No. 10.			
20.	Interstate		29.71	1,742
21.	Intrastate		70.29	4,120

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 212, Ties.

		%	$
1.	System Total, per Annal Report, $95,352; allocated to Michigan by Delf.	100.00	79,393
2.	Divided on Michigan Equated Track miles, Ratio No. 2.		
3.	Freight	17.27	13,711
4.	Common Freight and Passenger	82.53	65,523
5.	Passenger	.20	159
6.	Michigan Common, Line 4	100.00	65,523
7.	Divided on Michigan Total Gross Ton miles, Ratio No. 1.		
8.	Freight	67.62	44,307
9.	Passenger	32.38	21,216
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		13,711
12.	Common, Line 8		44,307
13.	Total Michigan Freight		58,018
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		159
16.	Common, Line 9		21,216
17.	Total Michigan Passenger		21,375
18.	Michigan Passenger, Line 17	100.00	21,375
19.	Divided on Michigan Passenger Gross Ton-miles, Ratio No. 1 a		
20.	Sleepers and Diners	40.06	8,563
21.	Mail and Express	14.50	3,099
22.	Passengers and Baggage	45.44	9,713
23.	Michigan Passengers and Baggage, Line 22	100.00	9,713
24.	Divided on Michigan Passenger miles, Ratio No. 10		
25.	Interstate	29.71	2,886
26.	Intrastate	70.29	6,827

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 214, Rails.

		%	$
1.	System Total, per Annual Report, $20,682; allocated to Michigan by Delf.	100.00	19,782
2.	Divided on Michigan Equated Track miles, Ratio No. 2.		
3.	Freight	17.27	3,416
4.	Common Freight and Passenger	82.53	16,326
5.	Passenger	.20	40
6.	Michigan Common, Line 4	100.00	16,326
7.	Divided on Michigan Total Gross Ton miles, Ratio No. 1.		
8.	Freight	67.62	11,040
9.	Passenger	32.38	5,286
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		3,416
12.	Common, Line 8		11,040
13.	Total Michigan Freight		14,456
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		40
16.	Common, Line 9		5,286
17.	Total Michigan Passenger		5,326
18.	Michigan Passenger, Line 17	100.00	5,326
19.	Divided on Michigan Passenger Gross Ton miles, Ratio No. 1 a		
20.	Sleepers and Diners	40.06	2,134
21.	Mail and Express	14.50	772
22.	Passengers and Baggage	45.44	2,420
23.	Michigan Passengers and Baggage, Line 22	100.00	2,420
24.	Divided on Michigan Passenger miles, Ratio No. 10		
25.	Interstate	29.71	719
26.	Intrastate	70.29	1,701

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 216, Other Track Material.

		%	$
1.	System Total, per Annual Report, $23,469; allocated to Michigan by Delf.	100.00	21,806
2.	Divided on Michigan Equated Track Miles, Ratio No. 2.		
3.	Freight	17.27	3,766
4.	Common Freight and Passenger	82.53	17,996
5	Passenger	.20	44
6.	Michigan Common, Line 4.	100.00	17,996
7.	Divided on Michigan Total Gross Ton Miles, Ratio No. 1.		
8.	Freight	67.62	12,169
9.	Passenger	32.38	5,827
10.	Michigan Freight Recap.:		
11.	Exclusive, Line 3		3,766
12.	Common, Line 8		12,169
13.	Total Michigan Freight		15,935
14.	Michigan Passenger Recap.:		
15.	Exclusive, Line 5		44
16.	Common, Line 9		5,827
17.	Total Michigan Passenger		5,871
18.	Michigan Passenger, Line 17	100.00	5,871
19.	Divided on Mich. Pass. Gross Ton miles, Ratio No. 1a.		
20.	Sleepers and Diners	40.06	2,352
21.	Mail and Express	14.50	851
22.	Passengers and Baggage	45.44	2,668
23.	Michigan Passengers and Baggage, Line 22	100.00	2,668
24.	Divided on Michigan Passenger Miles, Ratio No. 10.		
25.	Interstate	29.71	793
26.	Intrastate	70.29	1,875

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 218—Ballast.

		%	$
1.	System Total, per Annual Report, $10,362; allocated to Michigan by Delf.	100.00	9,703
2.	Divided on Michigan Equated Track miles, Ratio No. 2.		
3.	Freight	17.27	1,676
4.	Common Freight and Passenger	82.53	8,008
5.	Passenger	.20	19
6.	Michigan Common, Line 4	100.00	8,008
7.	Divided on Michigan Total Gross Ton miles, Ratio No. 1.		
8.	Freight	67.62	5,415
9.	Passenger	32.38	2,593
10.	Michigan Freight Recap.:		
11.	Exclusive, Line 3		1,676
12.	Common, Line 8		5,415
13.	Total Michigan Freight		7,091
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		19
16.	Common, Line 9		2,593
17.	Total Michigan Passenger		2,612
18.	Michigan Passenger, Line 17	100.00	2,612
19.	Divided on Michigan Passenger Gross Ton miles, Ratio No. 1a.		
20.	Sleepers and Diners	40.06	1,046
21.	Mail and Express	14.50	379
22.	Passengers and Baggage	45.44	1,187
23.	Michigan Passengers and Baggage, Line 22	100.00	1,187
24.	Divided on Michigan Passenger miles, Ratio No. 10.		
25.	Interstate	29.71	353
26.	Intrastate	70.29	834

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 220, Track Laying and Surfacing.

		%	$
1.	System Total, per Annual Report, $178,067; allocated to Michigan		145,548
2.	Subdivided into sub-primary accounts.		
3.	Applying Ballast		7,516
4.	Applying Ties		38,551
5.	Applying Rails		5,598
6.	Applying Other Track Material		1,831
7.	Track Maintenance		88,487
8.	Track Changes		196
9.	Train Service		3,288
10.	Other Expenses		81
11.	Michigan Total, Line 1.	100.00	145,548
12.	Divided on Michigan Equated Track Miles, Ratio No. 2.		
13.	Freight	17.27	25,136
14.	Common Freight and Passenger	82.53	120,121
15.	Passenger	.20	291
16.	Michigan Common, Line 14	100.00	120,121
17.	Divided on Michigan Total Gross Ton miles, Ratio No. 1.		
18.	Freight	67.62	81,226
19.	Passenger	32.38	38,895
20.	Michigan Freight Recap:		
21.	Exclusive, Line 13		25,136
22.	Common, Line 18		81,226
23.	Total Michigan Freight		106,362

No. 220—Track Laying and Surfacing (Continued).

		%	$
24.	Michigan Passenger Recap:		
25.	Exclusive, Line 15		291
26.	Common, Line 19		38,895
27.	Total Michigan Passenger		39,186
28.	Michigan Passenger, Line 27	100.00	39,186
29.	Divided on Michigan Passenger Gross Ton miles, Ratio No. 1 a.		
30.	Sleepers and Diners	40.06	15,698
31.	Mail and Express	14.50	5,682
32.	Passengers and Baggage	45.44	17,806
33.	Michigan Passengers and Baggage, Line 32	100.00	17,806
34.	Divided on Michigan Passenger Miles, Ratio No. 10		
35.	Interstate	29.71	5,290
36.	Intrastate	70.29	12,516

NOTE: This account corresponds with Group A. of Account No. 6, under the old classification.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 221—Right-of-Way Fences.

		%	$
1.	System Total, per Annual Report, $5,616; allocated to Michigan by Delf.	100.00	3,309
2.	Divided on Michigan Equated Track Miles, Ratio No. 2.		
3.	Freight	17.27	571
4.	Common Freight and Passenger	82.53	2,731
5.	Passenger	.20	7
6.	Michigan Common, Line 4	100.00	2,731
7.	Divided on Michigan Time, Ratio No 4.		
8	Freight	71.79	1,961
9.	Passenger	28.21	770
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		571
12.	Common, Line 8		1,961
13.	Total Michigan Freight		2,532
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		7
16.	Common, Line 9		770
17.	Total Michigan Passenger		777
18.	Michigan Passenger, Line 17	100.00	777
19.	Divided on Michigan Total Passenger train car miles, Ratio No. 3.		
20.	Sleepers and Diners	29.89	232
21.	Mail and Express	15.00	117
22	Passengers and Baggage	55.11	428
23.	Michigan Passengers and Baggage, Line 22	100.00	428
24.	Divided on Michian Passenger miles, Ratio No. 10.		
25.	Interstate	29.71	127
26.	Intrastate	70.29	301

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 223—Snow and Sand Fences and Snowsheds.

		%	$
1.	System Total, per Annual Report, $244; allocated to Michigan by Delf.	100.00	199
2.	Divided on Michigan Equated Track miles, Ratio No. 2.		
3.	Freight	17.27	34
4.	Common Freight and Passenger	82.53	164
5.	Passenger	.20	1
6	Michigan Common, Line 4	100.00	164
7.	Divided on Michigan Time, Ratio No. 4		
8.	Freight	71.79	118
9.	Passenger	28.21	46
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		34
12.	Common, Line 8		118
13.	Total Michigan Freight		152
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		1
16.	Common, Line 9		46
17.	Total Michigan Passenger		47
18.	Michigan Passenger, Line 17	100.00	47
19.	Divided on Michigan Total Passenger train car miles, Ratio No. 3.		
20.	Sleepers and Diners	29.89	14
21.	Mail and Express	15.00	7
22.	Passengers and Baggage	55.11	26
23.	Michigan Passengers and Baggage, Line 22	100.00	26
24.	Divided on Michigan Passenger miles, Ratio No. 10.		
25.	Interstate	29.71	8
26.	Intrastate	70.29	18

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 225, Crossings and Signs.

		%	$
1.	System Total, per Annual Report, $1,656; allocated to Michigan by Delf.	100.00	1,304
2.	Divided on Michigan Equated Track miles, Ratio No. 2		
3.	Freight	17.27	225
4.	Common Freight and Passenger	82.53	1,076
5.	Passenger	.20	3
6.	Michigan Common, Line 4	100.00	1,076
7.	Divided on Michigan Time, Ratio No. 4.		
8.	Freight	71.79	772
9.	Passenger	28.21	304
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		225
12.	Common, Line 8		772
13.	Total Michigan Freight		997
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		3
16.	Common, Line 9		304
17.	Total Michigan Passenger		307
18.	Michigan Passenger, Line 17	100.00	307
19.	Divided on Michigan Total Passenger train car miles, Ratio No. 3.		
20.	Sleepers and Diners	29.89	92
21.	Mail and Express	15.00	46
22.	Passengers and Baggage	55.11	169
23.	Michigan Passengers and Baggage, Line 22	100.00	169
24.	Divided on Michigan Passenger miles, Ratio No. 10.		
25.	Interstate	29.71	50
26.	Intrastate	70.29	119

DULUTH SOUTH SHORE & ATLANTIC RAILWAY.
Fiscal Year 1915.

No. 227, Station and Office Building.

			%	$
1.	System Total, per Annual Report, $7,089; allocated to Michigan.			6,409
2.	Allocated to Services (Hillman data)			
3.	Track Scales (all Freight)			932
4.	Other Freight			402
5.	Common Freight and Passenger (Stations)			3,620
6.	Common Freight and Passenger (General Offices)			103
7.	Passenger			1,352
8.	Michigan Common Stations, Line 5		100.00	3,620
9.	Divided on Station Payroll, Ratio No. 17			
10.	Freight		84.18	3,047
11.	Passenger		15.82	573
12.	Michigan Common General Offices, Line 6		100.00	103
13.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Account No. IV., "Transportation."	$950,701		
14.	Freight	659,202	69.34	71
15.	Passenger	291,499	30.66	32
16.	Michigan Freight Recap:			
17.	Track Scales, Line 3			932
18.	Other Exclusive, Line 4			402
19.	Common Stations, Line 10			3,047
20.	Common General Offices, Line 14			71
21.	Total Michigan Freight			4,452
22.	Michigan Passenger Recap:			
23.	Exclusive, Line 7			1,352
24.	Common Stations, Line 11			573
25.	Common General Offices, Line 15			32
26.	Total Michigan Passenger			1,957
27.	Michigan Passenger, Line 26		100.00	1,957
28.	Divided relatively with the charges to Michigan Passenger Services in Account No. 373.	$21,846		
29.	Mail and Express	2,185	10.00	196
30.	Passengers and Baggage	19,661	90.00	1,761
31.	Michigan Passengers and Baggage, Line 30		100.00	1,761
32.	Divided on Michigan Passenger miles, Ratio No. 10			
33.	Interstate		29.71	523
34.	Intrastate		70.29	1,238

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 229, Roadway Buildings.

		%	$
1.	System Total, per Annual Report, $1,933; allocated to Michigan by Delf.	100.00	1,193
2.	Divided on Michigan Equated Track Miles, Ratio No. 2		
3.	Freight	17.27	206
4.	Common Freight and Passenger	82.53	985
5.	Passenger	.20	2
6.	Michigan Common, Line 4	100.00	985
7.	Divided on Michigan Total Gross Ton miles, Ratio No. 1		
8.	Freight	67.62	666
9.	Passenger	32.38	319
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		206
12.	Common, Line 8		666
13.	Total Michigan Freight		872
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		2
16.	Common, Line 9		319
17.	Total Michigan Passenger		321
18.	Michigan Passenger, Line 17	100.00	321
19.	Divided on Michigan Passenger Gross Ton miles, Ratio No. 1 a.		
20.	Sleepers and Diners	40.06	129
21.	Mail and Express	14.50	46
22.	Passengers and Baggage	45.44	146
23.	Michigan Passengers and Baggage, Line 22	100.00	146
24.	Divided on Michigan Passenger miles, Ratio No. 10		
25.	Interstate	29.71	43
26.	Intrastate	70.29	103

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 231, Water Stations.
No. 233, Fuel Stations.

			No. 231	No. 233
		%	$	$
1. System Total, per Annual Report		100.00	5,065	2,581
2. Divided relatively with the total of charges to Michigan and Outside Michigan in Accounts 382 & 394	$289,129			
3. Outside Michigan	44,471	15.38	779	397
4. Michigan	244,658	84.62	4,286	2,184
5. Michigan Total, Line 4		100.00	4,286	2,184
6. Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 382 and 394	$240,206			
7. Freight	158,276	65.89	2,824	1,439
8. Passenger	81,930	34.11	1,462	745
9. Michigan D.S.S.&A. Passenger, Line 8		100.00	1,462	745
10. Divided relatively with the total of charges to Michigan Passenger Services in Accounts 382 and 394	$ 81,930			
11. Sleepers and Diners	33,474	40.86	597	304
12. Mail and Express	11,941	14.57	213	109
13. Passengers and Baggage	36,515	44.57	652	332
14. Mich. Passengers and Baggage, Line 13		100.00	652	332
15. Divided on Mich. Passenger Miles, Ratio No. 10.				
16. Interstate		29.71	194	99
17. Intrastate		70.29	458	233

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 235. Shops and Enginehouses.

			$	$
1.	System Total, per Annual Report			3,519
2.	Allocated to Shops and Enginehouses.			
3.	Marquette General Shops.			1,326
4.	Enginehouses:			
5.	Superior		55	
6.	Soo		49	
7.	Soo Junction		32	
8.	St. Ignace		105	
9.	Marquette		1,370	
10.	South Ishpeming		61	
11.	Michigamme		172	
12.	L'Anse		13	
13.	Houghton		255	
14.	Thomaston		81	
15.	Total Enginehouses			2,193
			%	
16.	System Total Shops, Line 3		100.00	1,326
17.	Divided relatively with the total of charges to total Michigan and outside of Michigan in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$296,408		
18.	Outside Michigan	45,056	15.20	202
19.	Michigan	251,352	84.80	1,124
20.	Michigan Total Shops, Line 19		100.00	1,124
21.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 308, 314, 317 and 326 (see detail page following Account 301)	$248,041		
22.	Freight	175,121	70.60	794
23.	Passenger	72,920	29.40	330

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 235—Shops and Enginehouses (Continued).

			%	$
24.	Michigan Passenger Shops, Line 23		100.00	330
25.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$ 72,920		
26.	Sleepers and Diners	21,039	28.85	95
27.	Mail and Express	13,163	18.05	60
28.	Passengers and Baggage	38,718	53.10	175
29.	System Total Enginehouses, Line 15		100.00	2,193
30.	Divided relatively with the total of charges to Michigan and Outside Michigan in Accounts 388 and 400	$57,724		
31.	Outside Michigan	6,793	11.77	258
32.	Michigan	50,931	88.23	1,935
33.	Michigan Total Enginehouses, Line 32		100.00	1,935
34.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 388 and 400	$50,931		
35.	Freight	34,688	68.11	1,318
36.	Passenger	16,243	31.89	617
37.	Michigan Passenger Enginehouses, Line 36		100.00	617
38.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 388 and 400	$16,243		
39.	Sleepers and Diners	6,604	40.66	251
40.	Mail and Express	2,208	13.59	8
41.	Passengers and Baggage	7,431	45.75	28
42.	Michigan Freight Recap:			
43.	Shops, Line 22			79
44.	Enginehouses, Line 35			1,31
45.	Total Michigan Freight			2,11

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 235—Shops and Enginehouses (Continued).

		%	$
46.	Michigan Passenger Recap:		
47.	Shops, Line 23		330
48.	Enginehouses, Line 36		617
49.	Total Michigan Passenger		947
50.	Michigan Sleepers and Diners Recap:		
51.	Shops, Line 26		95
52.	Enginehouses, Line 39		251
53.	Total Michigan Sleepers and Diners		346
54.	Michigan Mail and Express Recap:		
55.	Shops, Line 27		60
56.	Enginehouses, Line 40		84
57.	Total Michigan Mail and Express		144
58.	Michigan Passengers and Baggage Recap:		
59.	Shops, Line 28		175
60.	Enginehouses, Line 41		282
61.	Total Michigan Passengers and Baggage		457
62.	Michigan Passengers and Baggage, Line 61	100.00	457
63.	Divided on Michigan Passenger miles, Ratio No. 10.		
64.	Interstate	29.71	136
65.	Intrastate	70.29	321

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 241, Wharves and Docks.

		%	$
1.	System Total, per Annual Report, $884; allocated to Michigan by Delf.		884
2.	Allocated to Docks by us:		
3.	St. Ignace Merchandise Dock (all Freight)		46
4.	St. Ignace Slip Dock		838
5.	St. Ignace Slip Dock, Line 4	100.00	838
6.	Divided on basis arrived at by Delf. (a)		
7.	Freight	77.26	647
8.	Passenger	22.74	191
9.	Michigan Freight Recap:		
10.	St. Ignace Merchandise Dock, Line 3		46
11.	St. Ignace Slip Dock, Line 7		647
12.	Total Michigan Freight		693
13.	Michigan Passenger, Line 8	100.00	191
14.	Divided on basis of Passenger cars over St. Ignace Slip Dock.		
15.	Sleepers and Diners	33.09	63
16.	Mail and Express	12.93	25
17.	Passengers and Baggage	53.98	103
18.	Michigan Passengers and Baggage, Line 17	100.00	103
19.	Divided on Michigan Passenger miles, Ratio No. 10		
20.	Interstate	29.71	31
21.	Intrastate	70.29	72

NOTE:—

(a)

	Cars Over Slip Dock		
Class	Total	Equated	Percent
Freight	46,862	46,862	77.26
Passenger	6,897 x 2	13,794	22.74
		60,656	100

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 243, Coal and Ore Wharves.

	$
1. System Total, per Annual Report, $2,091; allocated to Michigan by Delf	2,091

All Freight.

No. 244, Coal and Ore Wharves—Depreciation.

	$
1. System Total, per Annual Report, $19,146; allocated to Michigan by Delf	19,146

All Freight.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 247, Telegraph and Telephone Lines.

			%	$
1.	System Total, per Annual Report.		100.00	2,857
2.	Divided on System Time, Ratio No. 4 a.			
3.	Freight		74.13	2,118
4.	Passenger		25.87	739
5.	System Freight, Line 3.		100.00	2,118
6.	Divided relatively with the total mileage of Freight trains (including proportion of Mixed and Special) plus Train and Yard Switching in and outside of Michigan	1,135,429		
7.	Outside Michigan	157,580	13.88	294
8.	Michigan	977,849	86.12	1,824
9.	System Passenger, Line 4		100.00	739
10.	Divided relatively with the total mileage of Passenger trains (including C.&M. and C.M.&St.P. operations into Marquette and proportion of Mixed and Special) plus train and yard switching in and outside Michigan.	954,928		
11.	Outside Michigan	158,357	16.58	123
12.	Michigan	796,571	83.42	616
13.	Michigan Passenger, Line 12		100.00	616
14.	Divided on Michigan Total Passenger train car miles, Ratio No. 3			
15.	Sleepers and Diners		29.89	184
16.	Mail and Express		15.00	92
17.	Passengers and Baggage		55.11	340
18.	Michigan Passengers and Baggage, Line 17		100.00	340
19.	Divided on Michigan Passenger miles, Ratio No. 10			
20.	Interstate		29.71	101
21.	Intrastate		70.29	239

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 249, Signals and Interlockers.

		%	$
1.	System Total, per Annual Report, $492; allocated to Michigan by Delf.	100.00	198
2.	Divided on same basis as Account No. 404.		
3.	Freight	94.76	188
4.	Passenger	5.24	10
5.	Michigan Passenger, Line 4	100.00	10
6.	Divided on Michigan Total Passenger Train Car miles, Ratio No. 3.		
7.	Sleepers and Diners	29.89	3
8.	Mail and Express	15.00	1
9.	Passengers and Baggage	55.11	6
10.	Michigan Passengers and Baggage, Line 9	100.00	6
11.	Divided on Mich. Passenger Miles, Ratio No. 10.		
12.	Interstate	29.71	2
13.	Intrastate	70.29	4

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 267, Paving.

			%	$
1.	System Total, per Annual Report, $8; allocated to Michigan by Delf.		100.00	8
2.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$402,485		
3.	Freight	296,716	73.72	6
4.	Passenger	105,769	26.28	2
5.	Michigan Passenger, Line 4		100.00	2
6.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	105,769		
7.	Sleepers and Diners	38,936	36.81	1
8.	Mail and Express	15,381	14.54	0
9.	Passengers and Baggage	51,452	48.65	1
10.	Michigan Passengers and Baggage, Line 9		100.00	1
11.	Divided on Michigan Passenger miles, Ratio No. 10			
12.	Interstate		29.71	0
13.	Intrastate		70.29	1

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 269—Roadway Machines.

			%	$
1.	System Total, per Annual Report		100.00	845
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$517,410		
3.	Outside Michigan	114,925	22.21	188
4.	Michigan	402,485	77.79	657
5.	Michigan Total, Line 4		100.00	657
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$402,485		
7.	Freight	296,716	73.72	484
8.	Passenger	105,769	26.28	173
9.	Michigan Passenger, Line 8		100.00	173
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$105,769		
11.	Sleepers and Diners	38,936	36.81	64
12.	Mail and Express	15,381	14.54	25
13.	Passengers and Baggage	51,452	48.65	84
14.	Michigan Passengers and Baggage, Line 13		100.00	84
15.	Divided on Michigan Passenger miles, Ratio No. 10.			
16.	Interstate		29.71	25
17.	Intrastate		70.29	59

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 271, Small Tools and Supplies.

		%	$
1. System Total, per Annual Report		100.00	7,954
2. Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Accounts No. 201)	$517,410		
3. Outside Michigan	114,925	22.21	1,767
4. Michigan	402,485	77.79	6,187
5. Michigan Total, Line 4		100.00	6,187
6. Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$402,485		
7. Freight	296,716	73.72	4,561
8. Passenger	105,769	26.28	1,626
9. Michigan Passenger, Line 8		100.00	1,626
10. Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$105,769		
11. Sleepers and Diners	38,936	36.81	599
12. Mail and Express	15,381	14.54	236
13. Passengers and Baggage	51,452	48.65	791
14. Michigan Passengers and Baggage, Line 13		100.00	791
15. Divided on Michigan Passenger miles, Ratio No. 10			
16. Interstate		29.71	235
17. Intrastate		70.29	556

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 272, Removing Snow, Ice and Sand.

		%	$
1.	System Total, per Annual Report, $21,306; allocated to Michigan by Delf.	100.00	20,060
2.	Divided to Services by agreement.		
3.	Freight	29.00	5,817
4.	Common Freight and Passenger	70.00	14,042
5.	Passenger	1.00	201
6.	Michigan Common, Line 4	100.00	14,042
7.	Divided on Michigan Time, Ratio No. 4.		
8.	Freight	71.79	10,081
9.	Passenger	28.21	3,961
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		5,817
12.	Common, Line 8		10,081
13.	Total Michigan Freight		15,898
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		201
16.	Common, Line 9		3,961
17.	Total Michigan Passenger		4,162
18.	Michigan Passenger, Line 17	100.00	4,162
19.	Divided on Michigan Total Passenger train car miles, Ratio No. 3.		
20.	Sleepers and Diners	29.89	1,244
21.	Mail and Express	15.00	624
22.	Passengers and Baggage	55.11	2,294
23.	Michigan Passengers and Baggage, Line 22	100.00	2,294
24.	Divided on Mich. Passenger miles, Ratio No. 10.		
25.	Interstate	29.71	682
26.	Intrastate	70.29	1,612

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 273—Assessments for Public Improvements.

			%	$
1.	System Total, per Annual Report, $233; allocated to Michigan by Delf		100.00	99
2.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$402,485		
3.	Freight	296,716	73.72	73
4.	Passenger	105,769	26.28	26
5.	Michigan Passenger, Line 4		100.00	26
6.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$105,769		
7.	Sleepers and Diners	38,936	36.81	9
8.	Mail and Express	15,381	14.54	4
9.	Passengers and Baggage	51,452	48.65	13
10.	Michigan Passengers and Baggage, Line 9.		100.00	13
11.	Divided on Michigan Passenger Miles, Ratio No. 10			
12.	Interstate		29.71	4
13.	Intrastate		70.29	9

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 274—Injuries to Persons.

			%	$
1.	System Total, per Annual Report, $2,826; allocated to Michigan by Delf.			1,810
2.	Allocated to Services by Delf.			
3.	Freight			25
4.	Common Freight and Passenger			1,785
5.	Michigan Common, Line 4		100.00	1,785
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201).	$402,485		
7.	Freight	296,716	73.72	1,316
8.	Passenger	105,769	26.28	469
9.	Michigan Freight Recap:			
10.	Exclusive, Line 3			25
11.	Common, Line 7			1,316
12.	Total Michigan Freight			1,341
13.	Michigan Passenger, Line 8		100.00	469
14.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$105,769		
15.	Sleepers and Diners	38,936	36.81	173
16.	Mail and Express	15,381	14.54	68
17.	Passengers and Baggage	51,452	48.65	228
18.	Michigan Passengers and Baggage, Line 17		100.00	228
19.	Divided on Michigan Passenger Miles, Ratio No. 10.			
20.	Interstate		29.71	68
21.	Intrastate		70.29	160

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 275—Insurance.

			%	$
1.	System Total, per Annual Report, $4,532; allocated to Michigan by Delf			3,979
2.	Allocated to Services by Delf			
3.	Freight			1,397
4.	Common Freight and Passenger			2,455
5.	Passenger			127
6.	Michigan Common, Line 4		100.00	2,455
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$402,485		
8.	Freight	296,716	73.72	1,810
9.	Passenger	105,769	26.28	645
10.	Michigan Freight Recap:			
11.	Exclusive, Line 3			1,397
12.	Common, Line 8			1,810
13.	Total Michigan Freight			3,207
14.	Michigan Passenger Recap:			
15.	Exclusive, Line 5			127
16.	Common, Line 9			645
17.	Total Michigan Passenger			772

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 275—Insurance (Continued).

			%	$
18.	Michigan Passenger, Line 17		100.00	772
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$105,769		
20.	Sleepers and Diners	38,936	36.81	284
21.	Mail and Express	15,381	14.54	112
22.	Passengers and Baggage	51,452	48.65	376
23.	Michigan Passengers and Baggage, Line 22		100.00	376
24.	Divided on Michigan Passenger miles, Ratio No. 10			
25.	Interstate		29.71	112
26.	Intrastate		70.29	264

NOTE:—
Delf divides the Michigan Common Portion of this Charge as follows:

Station and Roadway Buildings	$ 473.24
Enginehouses	463.80
Shops	339.68
Water Tanks	314.10
Coal Stations	198.48
Bridges, etc.	666.25
Total	$2,455.55

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 276—Stationery and Printing.

			%	$
1.	System Total, per Annual Report		100.00	713
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$517,410		
3.	Outside Michigan	114,925	22.21	158
4.	Michigan	402,485	77.79	555
5.	Michigan Total, Line 4		100.00	555
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$402,485		
7.	Freight	296,716	73.72	409
8.	Passenger	105,769	26.28	146
9.	Michigan Passenger, Line 8		100.00	146
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$105,769		
11.	Sleepers and Diners	38,936	36.81	54
12.	Mail and Express	15,381	14.54	21
13.	Passengers and Baggage	51,452	48.65	71
14.	Michigan Passengers and Baggage, Line 13		100.00	71
15.	Divided on Michigan Passenger Miles, Ratio No. 10			
16.	Interstate		29.71	21
17.	Intrastate		70.29	50

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 277—Other Expenses.

			%	$
1.	System Total, per Annual Report		100.00	105
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$517,410		
3.	Outside Michigan	114,925	22.21	23
4	Michigan	402,485	77.79	82
5.	Michigan Total, Line 4		100.00	82
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243, inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$402,485		
7.	Freight	296,716	73.72	60
8.	Passenger	105,769	26.28	22
9.	Michigan Passenger, Line 8		100.00	22
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$105,769		
11.	Sleepers and Diners	38,936	36.81	8
12.	Mail and Express	15,381	14.54	3
13.	Passengers and Baggage	51,482	48.65	11
14.	Michigan Passengers and Baggage, Line 13		100.00	11
15.	Divided on Michigan Passenger miles, Ratio No. 10.			
16.	Interstate		29.71	3
17.	Intrastate		70.29	8

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 278—Maintaining Joint Tracks, Yards and Other Facilities—Dr.

			%	$
1.	System Total, per Annual Report, $8,505; allocated to Michigan			6,098
2.	Allocated to Services.			
3.	Freight			5,433
4.	Common Freight and Passenger			67
5.	Passenger			608
6.	Michigan Common, Line 4		100.00	67
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$402,485		
8.	Freight	296,716	73.72	49
9.	Passenger	105,769	26.28	18
10.	Michigan Freight Recap:			
11.	Exclusive, Line 3			5,423
12.	Common, Line 8			49
13.	Total Michigan Freight			5,472
14.	Michigan Passenger Recap:			
15.	Exclusive, Line 5			608
16.	Common, Line 9			18
17.	Total Michigan Passenger			626
18.	Michigan Passenger, Line 17			626
19.	Allocated to Interstate Passengers and Baggage account of Soo Bridge			65
20.	Balance			561

No. 278—Maintaining Joint Tracks, Yards and Other Facilities——Dr.
(Continued)

			%	$
21.	Michigan Passenger, other than Soo Bridge, Line 20		100.00	561
22.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$105,769		
23.	Sleepers and Diners	38,936	36.81	206
24.	Mail and Express	15,381	14.54	82
25.	Passengers and Baggage	51,452	48.65	273
26.	Michigan Passengers and Baggage, other than Soo Bridge, Line 25		100.00	273
27.	Divided on Michigan Passenger Miles, Ratio No. 10.			
28.	Interstate		29.71	81
29.	Intrastate		70.29	192
30.	Michigan Interstate Passengers and Baggage Recap:			
31.	Soo Bridge, Line 19			65
32	Other, Line 28			81
33.	Total Michigan Interstate Passengers and Baggage			146

NOTE—Crossing Gates make up the Michigan Common portion of this charge.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 279, Maintaining Joint Tracks, Yards and Other Facilities—Cr.

			%	$
1.	System Total, per Annual Report, $13,-632*; allocated to Michigan by Delf.			*13,632
2.	Allocated to Services (see following page)			
3.	Freight			*2,720
4.	Common Freight and Passenger			*6,752
5.	Passenger			*4,160
6.	Michigan Common, Line 4		100.00	*6,752
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$402,485		
8.	Freight	296,716	73.72	*4,978
9.	Passenger	105,769	26.28	*1,774
10.	Michigan Freight Recap:			
11.	Exclusive, Line 3			*2,720
12.	Common, Line 8			*4,978
13.	Total Michigan Freight			*7,698
14.	Michigan Passenger Recap:			
15.	Exclusive, Line 5			*4,160
16.	Common, Line 9			*1,774
17.	Total Michigan Passenger			*5,934

*Typewritten in red.

No. 279—Maintaining Joint Tracks, Yards and Other Facilities—Cr. (Continued)

			%	$
18.	Michigan Passenger, Line 17		100.00	*5,93
19.	Divided relatively with the Total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249 and 272 (see detail page following Account No. 201)	$105,769		
20.	Sleepers and Diners	38,936	36.81	*2,18
21.	Mail and Express	15,381	14.54	* 86
22.	Passengers and Baggage	51,452	48.65	*2,88
23.	Michigan Passengers and Baggage, Line 22		100.00	*2,88
24.	Divided on Michigan Passengers miles, Ratio No. 10			
25.	Interstate		29.71	* 85
26.	Intrastate		70.29	*2,02

*Typewritten in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

Details of Account No. 279, Maintaining Joint Tracks, Yards and Other Facilities—Cr.

	Total $	Freight $	Common $	Psngr. $
Negaunee Passenger Station	609.51			609.51
Soo Passenger Station	1.01			1.01
C.&N.W. Passenger Trains to Calumet and Marquette	2,525.33			2,525.33
C.M.&St.P. Passenger Trains to Calumet for 9 months	1,023.75			1,023.75
Negaunee Tracks, C.&N.W. Passenger Trains	360.00		360.00	
Mineral Range and C.&N.W. Freights	1,972.79		1,972.79	
Prison Tracks	199.04	199.04		
Freight Stations	57.78	57.78		
Joint Mine Tracks	2,355.27	2,355.27		
Depots, Keweenaw Bay, etc.	21.50		21.50	
Michigamme Water Tank	94.39		94.39	
Sidnaw Joint Tracks	29.01	29.01		
Bridges, Trestles and Culverts, C.&N.W.	496.10		496.10	
Soo Yards, Outside of Depot	3,620.54		3,620.54	
Scales	69.15	69.15		
Coal Plants	20.98		20.98	
Culverts	9.51		9.51	
Team Track	9.70	9.70		
Roundhouse	22.75		22.75	
Other Items	133.41		133.41	
Totals	13,631.52	2,719.95	6,751.97	4,159.60

II. MAINTENANCE OF EQUIPMENT.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

II. MAINTENANCE OF EQUIPMENT.

No. 301—Superintendence.

			%	$
1.	System Total, per Annual Report		100.00	12,520
2.	Divided relatively with the total of charges to Michigan and outside of Michigan on Accounts 308, 314, 317 and 326 (see detail page following)	$296,408		
3.	Outside Michigan	45,056	15.20	1,903
4	Michigan	251,352	84.80	10,617
5.	Michigan Total, Line 4		100.00	10,617
6.	Divided relatively with the total of charges to Michigan Freight and Passenger (M.R. and D.S.S.&A.) in Accounts 308, 314, 317 and 326 (see detail page following)	$251,352		
7.	Freight	175,121	69.67	7,397
8.	Passenger—M.R.	3,311	1.32	140
9.	Passenger—D.S.S.&A.	72,920	29.01	3,080
10.	Michigan D.S.S.&A. Passenger, Line 9		100.00	3,080
11.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 308, 314, 317 and 326 (see detail page following)	$ 72,920		
12.	Sleepers and Diners	21,039	28.85	889
13	Mail and Express	13,163	18.05	556
14.	Passengers and Baggage	38,718	53.10	1,635
15.	Michigan Passengers and Baggage, Line 14		100.00	1,635
16.	Divided on Michigan Passenger miles, Ratio No. 10			
17.	Interstate		29.71	486
18.	Intrastate		70.29	1,149

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

Details for dividing Accounts Nos. 235, 301, 302, 332, 333 and 334.

			Michigan						
						D. S. S. & A. Passenger			
Acct. No.	System Total	Outside Michigan	Total	Freight	Range Mineral Passenger	Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
308	$ 93,458	$13,717	$79,741	$46,017	$1,290	$32,434	$13,215	$ 4,722	$14,497
314	146,912	21,096	125,816	125,816					
317	50,303	8,953	41,350		2,021	39,329	7,391	8,272	23,666
326	5,735	1,290	4,445	3,288		1,157	433	169	555
Total	296,408	45,056	251,352	175,121	3,311	72,920	21,039	13,163	38,718

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 302—Shop Machinery.

			%	$
1.	System Total, per Annual Report		100.00	6,694
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$296,408		
3.	Outside Michigan	45,056	15.20	1,017
4.	Michigan	251,352	84.80	5,677
5.	Michigan Total, Line 4		100.00	5,677
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$248,041		
7.	Freight	175,121	70.60	4,008
8.	Passenger	72,920	29.40	1,669
9.	Michigan Passenger, Line 8		100.00	1,669
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$ 72,920		
11.	Sleepers and Diners	21,039	28.85	482
12.	Mail and Express	13,163	18.05	301
13.	Passengers and Baggage	38,718	53.10	886
14.	Michigan Passengers and Baggage, Line 13		100.00	886
15.	Divided on Michigan Passenger miles, Ratio No. 10			
16.	Interstate		29.71	263
17.	Intrastate		70.29	623

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 308, Steam Locomotives—Repairs.

			%	$
1.	System Total, per Annual Report			93,458
2.	Divided to Services (Hillman data)			
3.	Mineral Range Passenger (all Michigan)			1,290
4.	Regular Freight			41,803
5.	Mixed (all Michigan)			339
6.	Special			64
7.	Yard Switching (all Michigan)			11,318
8.	Passenger Train Switching (all Michigan)			85
9.	Regular Passenger			38,559
10.	System Regular Freight, Line 4		100.00	41,803
11.	Divided relatively with the total Mileage of Regular Freight train Locomotives in and outside of Michigan	$954,192		
12.	Outside Michigan	160,224	16.79	7,019
13.	Michigan	793,968	83.21	34,784
14.	Michigan Mixed, Line 5		100.00	339
15.	Divided relatively with the number of Freight and Passenger car miles in Mixed Trains			
16.	Freight		79.30	269
17.	Passenger		20.70	70
18.	System Special, Line 6		100.00	64
19.	Divided relatively with the Total Mileage of Special train, Locomotives in and outside of Michigan	1,511		
20.	Outside Michigan	211	13.24	8
21.	Michigan	1,300	86.76	56
22.	Michigan Special, Line 21		100.00	56
23.	Divided relatively with the Michigan Mileage of Special train locomotives in Mixed and Passenger Services	1,300		
24.	Mixed	827	63.62	36
25.	Passenger	473	36.38	20

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 308—Steam Locomotives—Repairs (Continued).

			%	$
26.	Michigan Special Mixed, Line 24		100.00	36
27.	Divided relatively with the number of Freight and Passenger car miles in Mixed Trains.			
28.	Freight		79.30	29
29.	Passenger		20.70	7
30.	Michigan Special Passenger Recap:			
31.	Exclusive, Line 25			20
32.	Mixed, Line 29			7
33.	Total Michigan Special Passenger			27
34.	Michigan Yard Switching, Line 7		100.00	11.318
35.	Divided in Michigan Total Yard Switching miles, Ratio No. 13 a.			
36.	Freight		96.62	10,935
37.	Passenger		3.38	383
38.	System Regular Passenger, Line 9		100.00	38.559
39.	Divided relatively with the Revenue Mileage of Regular D.S.S.&A. Passenger train locomotives in and outside of Michigan	$932,617		
40.	Outside Michigan	161,788	17.35	6,690
41.	Michigan	770,829	82.65	31,869
42.	Michigan Passenger Switching Recap:			
43.	Train, Line 8			85
44.	Yard, Line 37			383
45.	Total Michigan Passenger Switching			468
46.	Michigan Revenue Passenger Recap:			
47.	Mixed, Line 17			70
48.	Special, Line 33			27
49.	Regular, Line 41			31,869
50.	Total			31,966

No. 308 Steam Locomotives—Repairs. (Continued)

		%	$
51.	Michigan Passenger Switching, Line 45	100.00	468
52.	Divided on Michigan Total Passenger Switching miles, Ratio No. 13c.		
53.	Sleepers and Diners	38.78	182
54.	Mail and Express	7.72	36
55.	Passengers and Baggage	53.50	250
56.	Michigan Revenue Passenger, Line 50	100.00	31,966
57.	Divided on Michigan Passenger Gross Ton miles, Ratio No. 1b.		
58.	Sleepers and Diners	40.77	13,033
59.	Mail and Express	14.66	4,686
60.	Passengers and Baggage	44.57	14,247
61.	Michigan Freight Recap:		
62.	Regular, Line 13		34,784
63.	Mixed, Line 16		269
64.	Special, Line 28		29
65.	Yard Switching, Line 36		10,935
66.	Total Michigan Freight		46,017
67.	Michigan Passenger Recap:		
68.	Switching, Line 45		468
69.	Revenue, Line 50		31,966
70.	Total Michigan Passenger		32,434
71.	Michigan Sleepers and Diners Recap:		
72.	Switching, Line 53		182
73.	Revenue, Line 58		13,033
74.	Total Michigan Sleepers and Diners		13,215
75.	Michigan Mail and Express Recap:		
76.	Switching, Line 54		36
77.	Revenue, Line 59		4,686
78.	Total Michigan Mail and Express		4,722
79.	Michigan Passengers and Baggage Recap:		
80.	Switching Line 55		250
81.	Revenue, Line 60		14,247
82.	Total Michigan Passengers and Baggage		14,497
83.	Michigan Passengers and Baggage, Line 82	100.00	14,497
84.	Divided on Michigan Passenger miles, Ratio No. 10		
85.	Interstate	29.71	4,307
86.	Intrastate	70.29	10,190

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 309, Steam Locomotives—Depreciation.

			%	$
1.	System Total, per Annual Report			23,945
2.	Divided to Services (Hillman data)			
3.	Mineral Range Passenger (All Michigan)			293
4.	Regular Freight			12,684
5.	Mixed (All Michigan)			123
6.	Special			18
7.	Yard Switching (All Michigan)			4,054
8.	Passenger Train Switching (All Michigan)			16
9.	Regular Passenger			6,757
10.	System Regular Freight, Line 4		100.00	12,684
11.	Divided relatively with the total mileage of Regular Freight train locomotives in and outside of Michigan	$954,192		
12.	Outside Michigan	160,224	16.79	2,130
13.	Michigan	793,968	83.21	10,554
14.	Michigan Mixed, Line 5		100.00	123
15.	Divided relatively with the number of Freight and Passenger cars in Mixed Trains			
16.	Freight		79.30	98
17.	Passenger		20.70	25
18.	System Special, Line 6		100.00	18
19.	Divided relatively with the total mileage of Special train Locomotives in and outside of Michigan	1,511		
20.	Outside Michigan	211	13.24	2
21.	Michigan	1,300	86.76	16
22.	Michigan Special, Line 21		100.00	16
23.	Divided relatively with the Michigan mileage of Special train Locomotives in Mixed and Passenger Services	1,300		
24.	Mixed	827	63.62	10
25.	Passenger	473	36.38	6

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 309—Steam Locomotives—Depreciation (Continued).

			%	$
26.	Michigan Special Mixed, Line 24		100.00	10
27.	Divided relatively with the number of Freight and Passenger cars in Mixed Trains			
28.	Freight		79.30	8
29.	Passenger		20.70	2
30.	Michigan Special Passenger Recap.:			
31.	Exclusive, Line 25			6
32.	Mixed, Line 29			2
33.	Total Michigan Special Passenger			8
34.	Michigan Yard Switching, Line 7		100.00	4,054
35.	Divided on Michigan Total Yard Switching miles, Ratio No. 13a			
36.	Freight		96.62	3,917
37.	Passenger		3.38	137
38.	System Regular Passenger, Line 9		100.00	6,757
39.	Divided relatively with the Revenue Mileage of Regular D.S.S.&A. Passenger Train Locomotives in and outside of Michigan	932,617		
40.	Outside Michigan	161,788	17.35	1,172
41.	Michigan	770,829	82.65	5,585
42.	Michigan Passenger Switching Recap.:			
43.	Train, Line 8			16
44.	Yard, Line 37			137
45.	Total Michigan Passenger Switching			153
46.	Michigan Revenue Passenger Recap.:			
47.	Mixed, Line 17			25
48.	Special, Line 33			8
49.	Regular Line 41			5,585
50.	Total Michigan Revenue Passenger			5,618
51.	Michigan Passenger Switching, Line 45		100.00	153
52.	Divided on Michigan Total Passenger Switching miles, Ratio No. 13c.			
53.	Sleepers and Diners		38.78	59
54.	Mail and Express		7.72	12
55.	Passengers and Baggage		53.50	82

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 309—Steam Locomotives—Depreciation (Continued).

		%	$
56.	Michigan Revenue Passenger, Line 50	100.00	5,618
57.	Divided on Michigan Passenger Gross Ton miles, Ratio No. 1b.		
58.	Sleepers and Diners	40.77	2,290
59.	Mail and Express	14.66	824
60.	Passengers and Baggage	44.57	2,504
61.	Michigan Freight Recap.:		
62.	Regular, Line 13		10,554
63.	Mixed, Line 16		98
64.	Special, Line 28		8
65.	Yard Switching, Line 36		3,917
66.	Total Michigan Freight		14,577
67.	Michigan Passenger Recap.:		
68.	Switching, Line 45		153
69.	Revenue, Line 50		5,618
70.	Total Michigan Passenger		5,771
71.	Michigan Sleepers and Diners Recap.:		
72.	Switching, Line 53		5
73.	Revenue, Line 58		2,296
74.	Total Michigan Sleepers and Diners		2,341
75.	Michigan Mail and Express Recap.:		
76.	Switching Line 54		1
77.	Revenue, Line 59		82
78.	Total Michigan Mail and Express		83
79.	Michigan Passengers and Baggage Recap.:		
80.	Switching, Line 55		8
81.	Revenue, Line 60		2,50
82.	Total Michigan Passengers and Baggage		2,58
83.	Michigan Passengers and Baggage, Line 82	100.00	2,58
84.	Divided on Mich. Pass. miles, Ratio No. 10		
85.	Interstate	29.71	76
86.	Intrastate	70.29	1,81

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 310—Steam Locomotives—Retirements.

		%	$
1.	System Total, per Annual Report; *$233; allocated to Michigan		*187
2.	Allocated to Services (Hillman data)		
3.	Regular Freight		*232
4.	Yard Switching		46
5.	Regular Passenger		*1
6.	Michigan Yard Switching, Line 4	100.00	46
7.	Divided on Michigan Total Yard Switching miles, Ratio No. 13a.		
8.	Freight	96.62	44
9.	Passenger	3.38	2
10.	Michigan Freight Recap.:		
11.	Regular, Line 3		*232
12.	Yard Switching, Line 8		44
13.	Total Michigan Freight		*188
14.	Michigan Passenger Recap.:		
15.	Regular, Line 5		*1
16.	Yard Switching, Line 9		2
17.	Total Michigan Passenger		1
18.	Michigan Passenger, Line 17	100.00	1
19.	Divided on Michigan Passenger Yard Switching miles, Ratio No. 13b.		
20.	Sleepers and Diners	50.59	1
21.	Mail and Express	4.99	0
22.	Passengers and Baggage	44.42	0

*Typewritten in red.

No. 314—Freight Train Cars—Repairs.
No. 315—Freight Train Cars—Depreciation.
No. 316—Freight Train Cars—Retirements.

		No. 314	No. 315	No. 316
		$	$	$
	System Total, per Annual Report	146,912	62,766	2,151
	Assigned to Michigan by Delf All Freight.	125,816	53,753	1,842

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 317—Passenger Train Cars—Repairs.
No. 318—Passenger Train Cars—Depreciation.

			%	No. 317 $	No. 318 $
1.	System Total, per Annual Report (all Passenger)			50,303	12,367
2.	Allocated to Services.				
3.	Sleeper			5,455(a)	2,684
4.	Diner and Observation			3,850(a)	2,421
5.	Mail and Exp. and Passgr. & Baggage			40,998	7,262
6.	System Sleepers and Diners Recap:				
7.	Sleeper, Line 3			5,455	2,684
8.	Diner and Observation, Line 4			3,850	2,421
9.	Total System Sleepers and Diners			9,305	5,105
10.	System Sleepers and Diners, Line 9		100.00	9,305	5,105
	Mileage of Sleepers and Diners in and outside of Michigan (including mileage on Mineral Range)	1,075,996			
12.	Outside Michigan	221,316	20.57	1,914	1,050
13.	Michigan	854,680	79.43	7,391	4,055

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 317—Passenger Train Cars—Repairs.
No. 318—Passenger Train Cars—Depreciation.
(Continued)

		%	No. 317 $	No. 318 $
14.	System Mail and Express and Passenger and Baggage, Line 5	100.00	40,998	7,262
15.	Divided on Total DSS&A Passenger Car miles, Ratio No. 3c.			
16.	Outside Michigan	17.17	7,039	1,247
17.	Michigan—Mineral Range	4.93	2,021	358
18.	Michigan—DSS&A	77.90	31,938	5,657
19.	Michigan D.S.S.&A. Mail and Express and Passengers and Baggage, Line 18	100.00	31,938	5,657
20.	Divided on Michigan D.S.S.&A. Passenger Car miles, Ratio No. 3d.			
21.	Mail and Express	25.90	8,272	1,465
22.	Passengers and Baggage	74.10	23,666	4,192
23.	Michigan Passengers and Baggage, Line 22	100.00	23,666	4,192
24	Divided on Michigan Passenger miles, Ratio No. 10.			
25.	Interstate	29.71	7,031	1,245
26.	Intrastate	70.29	16,635	2,947

NOTE—(a) These amounts are the charges on account of these Services for 1914, the last year for which we have been able to ascertain these expenses.

The present classification requires that primary accounts involving expenditures for operations of this kind shall be kept so that they may be ascertained, but the Company has not kept its accounts in that manner and we are advised that the figures cannot now be had.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 326—Work Equipment—Repairs.
No. 327—Work Equipment—Depreciation.
No. 328—Work Equipment—Retirements.

				No. 326	No. 327	No. 328
			%	$	$	$
1.	System Total, per Annual Report		100.00	5,735	3,498	320
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accts. 202 to 225 inclusive, 241, 243, 247, 249 and 272 (see detail page following)	$497,223				
3.	Outside Michigan	111,869	22.50	1,290	787	72
4	Michigan	385,354	77.50	4,445	2,711	248
5.	Michigan Total, Line 4		100.00	4,445	2,711	248
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 225 inclusive, 241, 243, 247, 249 and 272 (see detail page following)	$385,354				
7.	Freight	285,017	73.96	3,288	2,005	183
8.	Passenger	100,337	26.04	1,157	706	65
9.	Michigan Passenger, Line 8		100.00	1,157	706	65
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accts. 202 to 225 inclusive, 241, 243, 247, 249 and 272 (see detail page following)	$100,337				
11.	Sleepers and Diners	37,560	37.44	433	264	24
12.	Mail and Express	14,673	14.62	169	103	10
13.	Passenger & Baggage	48,104	47.94	555	339	31
14.	Mich. Passengers and Baggage, Line 13		100.00	555	339	31
15.	Divided on Mich. Passenger Miles, Ratio No. 10.					
16.	Interstate		29.71	165	101	9
17.	Intrastate		70.29	390	238	22

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

Details for Dividing Accounts 326, 327 and 328.

Acct. No.	System Total	Outside Michigan	Michigan					
			Total	Freight	Passenger			
					Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
202	$ 47,209	$ 7,940	$ 39,269	$ 30,048	$ 9,221	$ 2,756	$ 1,383	$ 5,082
208	86,936	47,568	39,368	28,732	10,636	3,179	1,595	5,862
212	95,352	15,959	79,393	58,018	21,375	8,563	3,099	9,713
214	20,682	900	19,782	14,456	5,326	2,134	772	2,420
216	23,469	1,663	21,806	15,935	5,871	2,352	851	2,668
218	10,362	659	9,703	7,091	2,612	1,046	379	1,187
220	178,067	32,519	145,548	106,362	39,186	15,698	5,682	17,806
221	5,616	2,307	3,309	2,532	777	232	117	428
223	244	45	199	152	47	14	7	26
225	1,656	352	1,304	997	307	92	46	169
241	884		884	693	191	63	25	103
243	2,091		2,091	2,091				
247	2,857	417	2,440	1,824	616	184	92	340
249	492	294	198	188	10	3	1	6
272	21,306	1,246	20,060	15,898	4,162	1,244	624	2,294
TOTAL	497,223	111,869	385,354	285,017	100,337	37,560	14,673	48,104

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 332—Injuries to Persons.

			%	$
1.	System Total, per Annual Report			2,831
2.	Allocated to Services by Delf.			
3.	Freight			1,456
4.	Common Freight and Passenger			1,370
5.	Passenger			5
6.	System Freight, Line 3		100.00	1,456
7.	Divided relatively with the total mileage of Freight train cars in and outside of Michigan (Delf's Ex.)			
8.	Outside Michigan		14.36	209
9.	Michigan		85.64	1,247
10.	System Passenger, Line 5		100	5
11.	Divided relatively with the total mileage of Passenger train cars in and outside of Michigan (Delf's Ex.)			
12.	Outside Michigan		16.08	1
13.	Michigan		83.92	4
14.	System Common, Line 4		100.00	1,370
15.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 308, 314, 317 and 326 (see detail page following No. 301)	$296,408		
16.	Outside Michigan	45,056	15.20	208
17.	Michigan	251,352	84.80	1,162

No. 332—Injuries to Persons (Continued).

			%	$
18.	Michigan Common, Line 17		100.00	1,162
19.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$248,041		
20.	Freight	175,121	70.60	820
21.	Passenger	72,920	29.40	342
22.	Michigan Freight Recap:			
23.	Exclusive, Line 9			1,247
24.	Common, Line 20			820
25.	Total Michigan Freight			2,067
26.	Michigan Passenger Recap:			
27.	Exclusive, Line 13			4
28.	Common, Line 21			342
29.	Total Michigan Passenger			346
30.	Michigan Passenger, Line 29		100.00	346
31.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301	$ 72,920		
32.	Sleepers and Diners	21,039	28.85	100
33.	Mail and Express	13,163	18.05	62
34.	Passengers and Baggage	38,718	53.10	184
35.	Michigan Passengers and Baggage, Line 34		100.00	184
36.	Divided on Michigan Passenger miles, Ratio No. 10.			
37.	Interstate		29.71	55
38.	Intrastate		70.29	129

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 333—Insurance.

			%	$
1.	System Total, per Annual Report, $1,789; allocated to Michigan			1,510
2.	Allocated to Services			
3.	Freight			614
4.	Common Freight and Passenger			565
5.	Passenger			331
6.	Michigan Common, Line 4			565
7.	Allocated by Delf.			
8.	Shops			509
9.	Work Equipment			41
10.	Switch Locomotives			15
11.	Michigan Common Shops, Line 8		100.00	509
12.	Divided relatively with the charges to Michigan Freight and Passenger under "Shops" in Account No. 235	$ 1,124		
13.	Freight	794	70.64	360
14.	Passenger	330	29.36	149
15.	Michigan Common Work Equipment, Line 9		100.00	41
16.	Divided relatively with the charges to Michigan Freight and Passenger in Account No. 326	$ 4,445		
17.	Freight	3,288	73.97	30
18.	Passenger	1,157	26.03	11
19.	Michigan Common Switch Locomotives, Line 10		100.00	15
20.	Divided on Michigan Total Yard Switching Miles, Ratio No. 13a.			
21.	Freight		96.62	14
22.	Passenger		3.38	1

No. 333—Insurance (Continued).

			%	$
23.	Michigan Freight Recap:			
24.	Exclusive, Line 3			614
25.	Common Shops, Line 13			360
26.	Common Work Equipment, Line 17			30
27.	Common Switch Locomotives, Line 21			14
28.	Total Michigan Freight			1,018
29.	Michigan Passenger Recap:			
30.	Exclusive, Line 5			331
31.	Common Shops, Line 14			149
32.	Common Work Equipment, Line 18			11
33.	Common Switch Locomotives, Line 22			1
34.	Total Michigan Passenger			492
35.	Michigan Passenger, Line 34		100.00	492
36.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$ 72,920		
37.	Sleepers and Diners	21,039	28.85	142
38.	Mail and Express	13,163	18.05	89
39.	Passengers and Baggage	38,718	53.10	261
40.	Michigan Passengers and Baggage, Line 39		100.00	261
41.	Divided on Michigan Passenger Miles, Ratio No. 10.			
42.	Interstate		29.71	78
43.	Intrastate		70.29	183

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 334—Stationery and Printing.

			%	$
1.	System Total, per Annual Report		100.00	1,101
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$296,408		
3.	Outside Michigan	45,056	15.20	167
4.	Michigan	251,352	84.80	934
5.	Michigan Total, Line 4		100.00	934
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$248,041		
7.	Freight	175,121	70.60	659
8.	Passenger	72,920	29.30	275
9.	Michigan Passenger, Line 8		100.00	275
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$ 72,920		
11.	Sleepers and Diners	21,039	28.85	79
12.	Mail and Express	13,163	18.05	50
13.	Passengers and Baggage	38,718	53.10	146
14.	Michigan Passengers and Baggage, Line 13		100.00	146
15.	Divided on Michigan Passenger Miles, Ratio No. 10.			
16.	Interstate		29.71	43
17.	Intrastate		70.29	103

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 336—Maintaining Joint Equipment at Terminals—Dr.

	$
1. System Total, per Annual Report	605

All Outside Michigan.

No. 337—Maintaining Joint Equipment at Terminals—Cr.

			%	$
1.	System Total, per Annual Report, *$13; allocated to Michigan by Delf.		100.00	*13
2.	Divided relatively with the charges to Michigan Freight and Passenger in Account No. 326	$ 4,445		
3.	Freight	3,288	73.97	*10
4.	Passenger	1,157	26.03	*3
5.	Michigan Passenger, Line 4		100.00	*3
6.	Divided relatively with the charges to Michigan Passenger Services in Account No. 326	$ 1,157		
7.	Sleepers and Diners	433	37.42	*1
8.	Mail and Express	169	14.61	*0
9.	Passengers and Baggage	555	47.97	*2
10.	Michigan Passengers and Baggage, Line 9		100.00	*2
11.	Divided on Michigan Passenger Miles, Ratio No. 10.			
12.	Interstate		29.71	*1
13.	Intrastate		70.29	*1

*Typewritten figures in red.

NOTE—This charge is for maintaining Snow Plow at the Soo.

III. TRAFFIC.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

III. TRAFFIC.

No. 351—Superintendence.

		%	$
1.	System Total, per Annual Report		31,298
2.	Allocated to Services by Delf.		
3.	Freight		17,106
4.	Passenger (all Passengers and Baggage)		14,192
5.	System Freight, Line 3	100.00	17,106
6.	Divided on System Revenue Freight Train miles, Ratio No. 11a.		
7.	Outside Michigan	16.94	2,898
8.	Michigan	83.06	14,208
9.	System Passengers and Baggage, Line 4	100.00	14,192
10.	Divided on System Revenue Passenger Train Miles, Ratio No. 11b.		
11.	Outside Michigan	17.35	2,462
12.	Michigan	82.65	11,730
13.	Michigan Passengers and Baggage, Line 12	100.00	11,730
14.	Divided on Michigan Passenger Miles, Ratio No. 10		
15.	Interstate	29.71	3,485
16.	Intrastate	70.29	8,245

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 352—Outside Agencies.

			%	$
1.	System Total, per Annual Report			37,255
2.	Allocated to Services by Delf.			
3.	Freight			15,682
4.	Passenger (all Passengers and Baggage)			21,573
5.	System, Freight, Line 3		100.00	15,682
6.	Divided on System Revenue Freight Train miles, Ratio No. 11a.			
7.	Outside Michigan		16.94	2,657
8.	Michigan		83.06	13,025
9.	System Passengers and Baggage, Line 4		100.00	21,573
10.	Divided on System Revenue Passenger Train miles, Ratio No. 11b.			
11.	Outside Michigan		17.35	3,743
12.	Michigan		82.65	17,830
13.	Michigan Passengers and Baggage, Line 12		100.00	17,830
14.	Divided, by agreement, on the basis of the allocations and assignments of the years 1910, 1911, 1912 and 1913	$134,057		
15.	Interstate	123,373	92.03	16,409
16.	Intrastate	10,684	7.97	1,421

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 353—Advertising.

			%	$
1.	System Total, per Annual Report			4,549
2.	Allocated to Services by Delf.			
3.	Freight			40
4.	Passenger (all Passengers and Baggage)			4,509
5.	System Freight, Line 3		100.00	40
6.	Divided on System Revenue Freight Train Miles, Ratio No. 11a.			
7.	Outside Michigan		16.94	7
8.	Michigan		83.06	33
9.	System Passengers and Baggage, Line 4		100.00	4,509
10.	Divided on System Revenue Passenger Train Miles, Ratio No. 11b.			
11.	Outside Michigan		17.35	782
12.	Michigan		82.65	3,727
13.	Michigan Passengers and Baggage, Line 12		100.00	3,727
14.	Divided, by agreement, on the basis of the allocations and assignments of the years 1910, 1911, 1912 and 1913	$18,909		
15.	Interstate	13,057	69.06	2,574
16.	Intrastate	5,852	30.94	1,153

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 354—Traffic Associations.

	$
1. System Total, per Annual Report, $346; allocated to Michigan by Delf.	287

All Freight.

No. 355—Fast Freight Lines.

	$
1. System Total, per Annual Report, $5; allocated to Michigan by Delf.	5

All Freight.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 356, Industrial and Immigration Bureaus.

			%	$
1.	System Total, per Annual Report		100.00	9,456
2.	Divided on basis of Delf's System Freight and Passenger Revenue	$2,778,099		
3.	Freight	1,813,059	65.26	6,171
4.	Passenger (all Passengers and Baggage)	965,040	34.74	3,285
5.	System Freight, Line 3		100.00	6,171
6.	Divided on basis of Delf's System Freight Revenue	$1,813,059		
7.	Outside Michigan	209,949	11.58	715
8.	Michigan	1,603,110	88.42	5,456
9.	System Passengers and Baggage, Line 4		100.00	3,285
10.	Divided on basis of Delf's System Passenger Revenue	$ 965,040		
11.	Outside Michigan	127,597	13.22	434
12.	Michigan	837,443	86.78	2,851
13.	Michigan Passengers and Baggage, Line 12		100.00	2,851
14.	Divided on Michigan Passenger miles, Ratio No. 10			
15.	Interstate		29.71	847
16.	Intrastate		70.29	2,004

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 357, Insurance.

		%	$
1.	System Total, per Annual Report, $101; allocated to Michigan by Delf (all Passengers and Baggage)		56
2.	Michigan Passengers and Baggage, Line 1	100.00	56
3.	Divided on Michigan Passenger miles, Ratio No. 10		
4.	Interstate	29.71	17
5.	Intrastate	70.29	39

No. 358, Stationery and Printing

		%	$
1.	System Total, per Annual Report		12,350
2.	Allocated to Services by Delf.		
3.	Freight		7,721
4.	Passenger (all Passengers and Baggage)		4,629
5.	System Freight, Line 3.	100.00	7,721
6.	Divided on System Revenue Freight Train Miles, Ratio No. 11a.		
7.	Outside Michigan	16.94	1,308
8.	Michigan	83.06	6,413
9.	System Passengers and Baggage, Line 4.	100.00	4,629
10.	Divided on System Revenue Passenger Train Miles, Ratio No. 11b.		
11.	Outside Michigan	17.35	803
12.	Michigan	82.65	3,826
13.	Michigan Passengers and Baggage, Line 12	100.00	3,826
14.	Divided on Michigan Passenger Miles, Ratio No. 10		
15.	Interstate	29.71	1,137
16.	Intrastate	70.29	2,689

IV. TRANSPORTATION—RAIL LINE.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

IV. TRANSPORTATION—RAIL LINE.
No. 371, Superintendence.

		%	$
1.	System Total, per Annual Report		21,469
2.	Assigned to Services		
3.	Freight (85% of Car Accountant's Pay Roll)		3,761
4.	Passenger (15% of Car Accountant's Pay Roll)		664
5.	Common Freight and Passenger (all other than Car Accountant's Pay Roll)		17,044
6.	System Freight, Line 3	100.00	3,761
7.	Divided relatively with the Total Mileage of Freight Train Cars in and outside of Michigan (Delf's Ex.)		
8.	Outside Michigan	14.36	540
9.	Michigan	85.64	3,221
10.	System Passenger, Line 4	100.00	664
11.	Divided relatively with the Total Mileage of Passenger Train Cars in and outside of Michigan (Delf's Ex.)		
12.	Outside Michigan	16.08	107
13.	Michigan	83.92	557
14.	Michigan Passenger, Line 13	100.00	557
15.	Divided on Michigan Total Passenger Train Car miles, Ratio No. 3.		
16.	Sleepers and Diners	29.89	166
17.	Mail and Express	15.00	84
18.	Passengers and Baggage	55.11	307

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 371, Superintendence (Continued)

			%	$
19.	System Common, Line 5		100.00	17,044
20.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 372 to 420 inclusive except 407 and 410 (see detail page following)	$1,108,929		
21.	Outside Michigan	173,852	15.68	2,672
22.	Michigan	935,077	84.32	14,372
23.	Michigan Common, Line 22		100.00	14,372
24.	Divided relatively with the total of charges to Michigan Freight and Passenger (M. R. and D. S. S. & A.) in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following)	$ 908,368		
25.	Freight	616,825	67.91	9,760
26.	Passenger—M. R.	12,012	1.32	190
27.	Passenger—D. S. S. & A.	279,531	30.77	4,422
28.	Michigan D. S. S. & A. Passenger, Line 27		100.00	4,422
29.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following)	$ 279,531		
30.	Sleepers and Diners	96,122	34.39	1,521
31.	Mail and Express	34,616	12.38	547
32.	Passengers and Baggage	148,793	53.23	2,354

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 317—Superintendence (Continued)

		%	$
33.	Michigan Freight Recap.:		
34.	Car Accountant's Pay Roll, Line 9		3,221
35.	Other, Line 25		9,760
36.	Total Michigan Freight		12,981
37.	Michigan Passenger Recap.:		
38.	Car Accountant's Pay Roll, Line 13		557
39.	Other Line 27		4,422
40.	Total Michigan Passenger		4,979
41.	Michigan Sleepers and Diners Recap.:		
42.	Car Accountant's Pay Roll, Line 16		166
43.	Other, Line 30		1,521
44.	Total Michigan Sleepers and Diners		1,687
45.	Michigan Mail and Express Recap.:		
46.	Car Accountant's Pay Roll, Line 17		84
47.	Other, Line 31		547
48.	Total Michigan Mail and Express		631
49.	Michigan Passengers and Baggage Recap.:		
50.	Car Accountant's Pay Roll, Line 18		307
51.	Other, Line 32		2.354
52.	Total Michigan Passengers and Baggage		2,661
53.	Michigan Passengers and Baggage, Line 52	100.00	2,661
54.	Divided on Michigan Passenger miles, Ratio No. 10		
55.	Interstate	29.71	791
56.	Intrastate	70.29	1,870

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

Details for dividing Accounts Nos. 371, 407, 410, 411, 412, 413, 414, 415, 416, 417, 420.

Michigan

D.S.S.& A. Passengers

Account No.	System Total	Outside Michigan	Total	Freight	Mineral Range Passenger	Total	Sleepers and Diners	Mail and Express	Passengers and Baggage
372	$ 12,821	$ 1,869	$ 10,952	$ 8,185		$ 2,767	$ 827	$ 415	$ 1,525
373	155,950	17,852	138,098	116,252		21,846		2,185	19,661
374	1,621	274	1,347	1,347					
375	16,704		16,704	16,704					
376	10,490	1,201	9,289	7,819		1,470			1,470
377	4,705		4,705	4,546		159	80	8	71
378	37,207		37,207	35,949		1,258	636	63	559
379	3,992		3,992	3,857		135	68	7	60
380	23,842		23,842	23,036		806	408	40	358
382	21,417		21,417	20,693		724	366	36	322
385	1,213		1,213	1,172		41	21	2	18
386	338		338	327		11	6	1	4
387	380		380	367		13	7	1	5
388	12,912		12,912	12,523		389	197	19	173
389	1,290		1,290	1,246		44	22	2	20
390	38,694	21,613	17,081	10,143		6,938	2,829	1,017	3,092
391	*13,579		*13,579	*11,730		*1,849	*754	*271	*824
392	155,965	25,779	130,186	72,421	3,002	54,763	22,327	8,028	24,406
394	267,712	44,471	223,241	137,583	4,452	81,206	33,108	11,905	36,193
397	14,695	2,442	12,253	7,551	244	4,458	1,817	654	1,987
398	4,453	740	3,713	2,288	74	1,351	551	198	602
399	3,202	534	2,668	1,685	36	947	386	139	422
400	44,812	6,793	38,019	22,165		15,854	6,407	2,189	7,258
401	183,652	30,914	152,738	97,098	2,967	52,673	9,020	4,535	39,118
402	36,619	6,097	30,522	7,326	1,237	21,959	6,722	3,379	11,858
403	14,273	3,330	10,943			10,943	10,943		
404	1,241	1,200	41	39		2	1		
405	8,590	480	8,110	7,685		425	127	64	234
418	10,292	1,744	8,548	8,548					
419	282	84	198			198			198
TOTAL	1,075,785	167,417	908,368	616,825	12,012	279,531	96,122	34,616	148,793
411	1,160	202	958						
412	3,302	2,366	936						
413	*4,999	*1,449	*3,550						
414	2,476	1,102	1,374						
415	1,287	6	1,281						
416	4,927	862	4,065						
417	1,511	702	809						
420	23,480	2,644	20,836						
TOTAL	1,108,929	173,852	935,077						

* Denotes figures in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 372—Dispatching Trains.

			%	$
1.	System Total, per Annual Report		100.00	12,821
2.	Divided on System Time, Ratio No. 4a.			
3.	Freight		74.13	9,504
4.	Passenger		25.87	3,317
5.	System Freight, Line 3		100.00	9,504
6.	Divided relatively with the total mileage of Freight trains (including proportion of Mixed and Special), plus Train and Yard Switching in and outside of Michigan	1,135,429		
7.	Outside Michigan	157,580	13.88	1,319
8.	Michigan	977,849	86.12	8,185
9.	System Passenger, Line 4		100.00	3,317
10.	Divided relatively with the total mileage of Passenger Trains (including C&NW andCM&St.P. operations into Marquette, and proportion of Mixed and Special, plus Train and Yard Switching in and outside of Michigan	954,928		
11.	Outside Michigan	158,357	16.58	550
12.	Michigan	796,571	83.42	2,767
13.	Michigan Passenger, Line 12		100.00	2,767
14.	Divided on Michigan Total Passenger train Car miles, Ratio No. 3.			
15.	Sleepers and Diners		29.89	827
16.	Mail and Express		15.00	415
17.	Passengers and Baggage		55.11	1,525
18.	Michigan Passengers and Baggage, Line 17		100.00	1,525
19.	Divided on Michigan Passenger Miles, Ratio No. 10			
20.	Interstate		29.71	453
21.	Intrastate		70.29	1,072

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 373—Station Employees.

		%	$
1.	System Total, per Annual Report, $155,950; allocated to Michigan by Delf		138,098
2.	Allocated to Freight and Passenger by us (Balance to Common)		
3.	Freight		58,181
4.	Common Freight and Passenger		68,984
5.	Passenger		10,933
6.	Michigan Common, Line 4	100.00	68,984
7.	Divided on Station Pay Roll, Ratio No. 17		
8.	Freight	84.18	58,071
9.	Passenger	15.82	10,913
10.	Michigan Freight Recap.:		
11.	Exclusive, Line 3		58,181
12.	Common, Line 8		58,071
13.	Total Michigan Freight		116,252
14.	Michigan Passenger Recap.:		
15.	Exclusive, Line 5		10,933
16.	Common, Line 9		10,913
17.	Total Michigan Passenger		21,846
18.	10% of Michigan Passenger charged to Mail and Express, because of Station Employees having to handle Mail to, from and at Stations		2,185
19.	Balance, all Passengers and Baggage		19,661
20.	Michigan Passengers and Baggage, Line 19	100.00	19,661
21.	Divided on Michigan Passenger Miles, Ratio No. 10		
22.	Interstate	29.71	5,841
23.	Intrastate	70.29	13,820

NOTE—This account was allocated by us as indicated above. Of the total Passenger allocation, the following is directly charged labor on account of Mail.

Sault Ste. Marie	$ 360
Marquette	420
Champion	30
Houghton	270
Total	$1,080

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 374—Weighing, Inspection and Demurrage Bureaus.
No. 375—Coal and Ore Wharves.

	No. 374	No. 375
	$	$
1. System Totals, per Annual Report	1,621	16,704
2. Allocated to Michigan by Delf	1,347	16,704

All Freight.

No. 376—Station Supplies and Expenses.

		%	$
1. System Total, per Annual Report, $10,490; allocated to Michigan by Delf		100.00	9,289
2. Divided relatively with the total charges to Michigan Freight and Passenger in Account No. 373	$138,098		
3. Freight	116,252	84.18	7,819
4. Passenger (all Passgrs. and Bagg.)	21,846	15.82	1,470
5. Michigan Passengers and Baggage, Line 4		100.00	1,470
6. Divided on Passenger miles, Ratio No. 10			
7. Interstate		29.71	437
8. Intrastate		70.29	1,033

No. 377—Yard Masters and Yard Clerks.
No. 378—Yard Conductors and Brakemen.
No. 379—Yard Switch and Signal Tenders.

	%	No. 377 $	No. 378 $	No. 379 $
1. System Total, per Annual Report (all allocated to Michigan by Delf)	100.00	4,705	37,207	3,992
2. Divided on Michigan Total Yard Switching Miles Ratio No. 13a.				
3. Freight	96.62	4,546	35,949	3,857
4. Passenger	3.38	159	1,258	135
5. Michigan Passenger, Line 4	100.00	159	1,258	135
6. Divided on Michigan Passenger Yard Switching Miles, Ratio No. 13b.				
7. Sleepers and Diners	50.59	80	636	68
8. Mail and Express	4.99	8	63	7
9. Passengers and Baggage	44.42	71	559	60
10. Michigan Passengers and Baggage, Line 9	100.00	71	559	60
11. Divided on Michigan Passenger Miles, Ratio No. 10				
12. Interstate	29.71	21	166	18
13. Intrastate	70.29	50	393	42

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 380—Yard Enginemen.

		%	$
1.	System Total, per Annual Report, $23,842; allocated to Michigan by Delf.	100.00	23,842
2.	Divided on Michigan Total Yard Switching Miles, Ratio No. 13a.		
3.	Freight	96.62	23,036
4.	Passenger	3.38	806
5.	Michigan Passenger, Line 4	100.00	806
6.	Divided on Michigan Passenger Yard Switching Miles, Ratio No. 13b.		
7.	Sleepers and Diners	50.59	408
8.	Mail and Express	4.99	40
9.	Passengers and Baggage	44.42	358
10.	Michigan Passengers and Baggage, Line 9	100.00	358
11.	Divided on Michigan Passenger Miles, Ratio No. 10.		
12.	Interstate	29.71	106
13.	Intrastate	70.29	252

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 382—Fuel for Yard Locomotives.
No. 385—Water for Yard Locomotives.
No. 386—Lubricants for Yard Locomotives.
No. 387—Other Supplies for Yard Locomotives.

		%	No. 382 $	No. 385 $	No. 386 $	No. 387 $
1.	System Totals, per Annual Report (all allocated to Michigan by Delf.)	100.00	21,417	1,213	338	380
2.	Divided on Michigan Total Switching Miles, Ratio No. 13a.					
3.	Freight	96.62	20,693	1,172	327	367
4.	Passenger	3.38	724	41	11	13
5.	Michigan Passenger, Line 4	100.00	724	41	11	13
6.	Divided on Michigan Passenger Yard Switching Miles, Ratio No. 13b.					
7.	Sleepers and Diners	50.59	366	21	6	7
8.	Mail and Express	4.99	36	2	1	1
9.	Passengers and Baggage	44.42	322	18	4	5
10.	Michigan Passengers and Baggage, Line 9	100.00	322	18	4	5
11.	Divided on Michigan Passengers Miles, Ratio No. 10.					
12.	Interstate	29.71	96	5	1	1
13.	Intrastate	70.29	226	13	3	4

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 388—Enginehouse Expenses—Yard.

		%	$
1.	System Total, per Annual Report, $12,912; allocated to Michigan by Delf.		12,912
2.	Allocated to Services.		
3.	Freight (Soo Roundhouse)		1,403
4.	Common Freight and Passenger		11,509
5.	Michigan Common, Line 4	100.00	11,509
6.	Divided on Michigan Total Yard Switching Miles, Ratio No. 13a.		
7.	Freight	96.62	11,120
8.	Passenger	3.38	389
9.	Michigan Freight Recap:		
10.	Exclusive, Line 3		1,403
11.	Common, Line 7		11,120
12.	Total Michigan Freight		12,523
13.	Michigan Passenger, Line 8	100.00	389
14.	Divided on Michigan Passenger Yard Switching Miles, Ratio No. 13b.		
15.	Sleepers and Diners	50.59	197
16.	Mail and Express	4.99	19
17.	Passengers and Baggage	44.42	173
18.	Michigan Passengers and Baggage, Line 17	100.00	173
19.	Divided on Michigan Passenger Miles Ratio No. 10.		
20.	Interstate	29.71	51
21.	Intrastate	70.29	122

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 389—Yard Supplies and Expenses.

		%	$
1.	System Total, per Annual Report (all allocated to Michigan by Delf.)	100.00	1,290
2.	Divided on Michigan Total Yard Switching Miles, Ratio No. 13a.		
3.	Freight	96.62	1,246
4.	Passenger	3.38	44
5.	Michigan Passenger, Line 4	100.00	44
6.	Divided on Michigan Passenger Yard Switching Miles, Ratio No. 13b.		
7.	Sleepers and Diners	50.59	22
8.	Mail and Express	4.99	2
9.	Passengers and Baggage	44.42	20
10.	Michigan Passengers and Baggage, Line 9	100.00	20
11.	Divided on Michigan Passenger Miles, Ratio No. 10.		
12.	Interstate	29.71	6
13.	Intrastate	70.29	14

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 390—Operating Joint Yards and Terminals—Dr.

			%	$
1.	System Total, per Annual Report, $38,694; allocated to Michigan by Delf.			17,081
2.	Allocated to Services by Delf.			
3.	Freight			10,142
4.	Common Freight and Passenger			2
5.	Passenger			6,937
6.	Michigan Common, Line 4		100.00	2
7.	Divided relatively with the direct charges to Michigan Freight and Passenger in this Account	$17,079		
8.	Freight	10,142	59.38	1
9.	Passenger	6,937	40.62	1
10.	Michigan Freight Recap:			
11.	Exclusive, Line 3			10,142
12.	Common, Line 8			1
13.	Total Michigan Freight			10,143
14.	Michigan Passenger Recap:			
15.	Exclusive, Line 5			6,937
16.	Common, Line 9			1
17.	Total Michigan Passenger			6,938
18.	Michigan Passenger, Line 17		100.00	6,938
19.	Divided on Michigan Passenger Gross Ton-miles, Ratio No. 1b.			
20.	Sleepers and Diners		40.77	2,829
21.	Mail and Express		14.66	1,017
22.	Passengers and Baggage		44.57	3,092
23.	Michigan Passengers and Baggage, Line 22		100.00	3,092
24.	Divided on Michigan Passenger Miles, Ratio No. 10.			
25.	Interstate		29.71	919
26.	Intrastate		70.29	2,173

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 391—Operating Joint Yards and Terminals—Cr.

			%	$
1.	System Total, per Annual Report, *$13,579. allocated to Michigan by Delf.			*13,579
2.	Allocated to Services.			
3.	Freight			*10,591
4.	Common Freight and Passenger			*2,988
5.	Michigan Common, Line 4		100.00	*2,988
6.	Divided relatively with Delf's assignment of Soo Enginehouse Expenses—Train, 1916.	$ 5,698		
7.	Freight	2,172	38.11	*1,139
8.	Passenger	3,526	61.89	*1,849
9.	Michigan Freight Recap:			
10.	Exclusive, Line 3			*10,591
11.	Common, Line 7			*1,139
12.	Total Michigan Freight			*11,730
13.	Michigan Passenger, Line 8		100.00	*1,849
14.	Divided on Michigan Passenger Gross Ton miles, Ratio No. 1 b.			
15.	Sleepers and Diners		40.77	*754
16.	Mail and Express		14.66	*271
17.	Passengers and Baggage		44.57	*824
18.	Michigan Passengers and Baggage, Line 17		100.00	*824
19.	Divided on Michigan Passenger miles, Ratio No. 10			
20.	Interstate		29.71	*245
21.	Intrastate		70.29	*579

NOTE—With the exception of $4.45, the Michigan Common portion of this charge is for service to train locomotives at Soo Roundhouse.

* Denotes red figures.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 392—Train Enginemen.

			%	$
1.	System Total, per Annual Report			155,965
2.	Assigned to Services by Delf			
3.	Freight			86,794
4.	Passenger			69,171
5.	System Freight, Line 3		100.00	86,794
6.	Divided relatively with the Total Mileage of Freight Train Locomotives (including proportion of Mixed and Special) in and outside of Michigan.	968,016		
7.	Outside Michigan	160,310	16.56	14,373
8.	Michigan	807,706	83.44	72,421
9.	System Passenger, Line 4		100.00	69,171
10.	Divided relatively with the Total Mileage of D.S.S.&A. Passenger train locomotives (including proportion of Mixed and Special) in and outside of Michigan, and on Mineral Range and DSS&A.	981,598		
11.	Outside Michigan	161,913	16.49	11,406
12.	Michigan—Mineral Range	42,577	4.34	3,002
13.	Michigan—D.S.S.&A.	777,108	79.17	54,763
14.	Michigan D.S.S.&A. Passenger, Line 13		100.00	54,763
15.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1 b.			
16.	Sleepers and Diners		40.77	22,327
17.	Mail and Express		14.66	8,028
18.	Passengers and Baggage		44.57	24,408
19.	Michigan Passengers and Baggage, Line 18		100.00	24,408
20.	Divided on Michigan Passenger Miles, Ratio No. 10			
21.	Interstate		29.71	7,252
22.	Intrastate		70.29	17,156

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915

No. 394—Fuel for Train Locomotives.

			%	$
1.	System Total per Annual Report			267,712
2.	Divided to Services.			
3.	Regular Freight			163,955
4.	Mixed (all Michigan)			1,343
5.	Special			209
6.	Regular Passenger			102,205
7.	System Freight, Line 3.		100.00	163,955
8.	Divided relatively with the Total Mileage of Regular Freight train Locomotives in and outside of Michigan	954,192		
9.	Outside Michigan	160,224	16.79	27,528
10.	Michigan	793,968	83.21	136,427
11.	Michigan Mixed, Line 4		100.00	1,343
12.	Divided relatively with the number of Freight and Passenger cars in Mixed Trains			
13.	Freight		79.30	1,065
14.	Passenger		20.70	278
15.	System Special, Line 5		100.00	209
16.	Divided relatively with the Total Mileage of Special train Locomotives in and outside of Michigan.	1,511		
17.	Outside Michigan	211	13.24	28
18.	Michigan	1,300	86.76	181
19.	Michigan Special, Line 18		100.00	181
20.	Divided relatively with the Michigan Mileage of Special train Locomotives in Mixed and Passenger Services.	1,300		
21.	Mixed	827	63.62	115
22.	Passenger	473	36.38	66

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 394—Fuel for Train Locomotives (Continued).

			%	$
23.	Michigan Special Mixed, Line 21		100.00	115
24.	Divided relatively with the Number of Freight and Passenger Cars in Mixed Trains.			
25.	Freight		79.30	91
26.	Passenger		20.70	24
27.	Michigan Special Passenger Recap:			
28.	Exclusive, Line 22			66
29.	Mixed, Line 26			24
30.	Total Michigan Special Passenger			90
31.	System Regular Passenger, Line 6.		100.00	102,205
32.	Divided relatively with the Total Mileage of Regular D.S.S.&A. Passenger train Locomotives in and outside of Michigan	977,414		
33.	Outside Michigan	161,788	16.55	16,915
34.	Michigan (including Mineral Range)	815,626	83.45	85,290
35.	Michigan Regular Passenger, Line 34.		100.00	85,290
36.	Divided relatively with Michigan Mileage of Regular D.S.S.&A. Passenger train Locomotives on Mineral Range and D.S.S.&A.	815,626		
37.	Mineral Range	42,577	5.22	4,452
38.	D. S. S. & A.	773,049	94,78	80,838
39.	Michigan Freight Recap:			
40.	Regular, Line 10			136,427
41.	Mixed, Line 13			1,065
42.	Special, Line 25			91
43.	Total Michigan Freight			137,583

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 394—Fuel for Train Locomotives (Continued).

		%	$
44.	Michigan Passenger Recap:		
45.	Mixed Line 14		278
46.	Special, Line 30		90
47.	Regular, Line 38		80,838
48.	Total Michigan Passenger		81,206
49.	Michigan Passenger, Line 48	100.00	81,206
50.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1 b.		
51.	Sleepers and Diners	40.77	33,108
52.	Mail and Express	14.66	11,905
53.	Passengers and Baggage	44.57	36,193
54.	Michigan Passengers and Baggage, Line 53	100.00	36,193
55.	Divided on Michigan Passenger Miles, Ratio No. 10.		
56.	Interstate	29.71	10,753
57.	Intrastate	70.29	25,440

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 397—Water for Train Locomotives.
No. 398—Lubricants for Train Locomotives.

				No. 397	No. 398
			%	$	$
1.	System Totals, per Annual Report		100.00	14,695	4,453
2.	Divided to Services relatively with Account No. 394	$267,712			
3.	Regular Freight	163,955	61.24	8,999	2,727
4.	Mixed (all Michigan)	1,343	.50	73	22
5.	Special	209	.08	12	4
6.	Regular Passenger	102,205	38.18	5,611	1,700
7.	System Regular Freight, Line 3		100.00	8,999	2,727
8.	Divided relatively with Account No. 394				
9.	Outside Michigan		16.79	1,511	458
10.	Michigan		83.21	7,488	2,269
11.	Michigan Mixed, Line 4		100.00	73	22
12.	Divided relatively with Account No. 394				
13.	Freight		79.30	58	17
14.	Passenger		20.70	15	5
15.	System Special, Line 5		100.00	12	4
16.	Divided relatively with Account No. 394				
17.	Outside Michigan		13.24	2	1
18.	Michigan		86.76	10	3
19.	Michigan Special, Line 18		100.00	10	3
20.	Divided relatively with Account No. 394				
21.	Mixed		63.62	6	2
22.	Passenger		36.38	4	1

No. 397—Water for Train Locomotives.
No. 398—Lubricants for Train Locomotives.
(Continued)

		%	$	$
23.	Michigan Special Mixed, Line 21	100.00	6	2
24.	Divided relatively with Account No. 394			
25.	Freight	79.30	5	2
26.	Passenger	20.70	1	0
27.	Michigan Special Passenger Recap:			
28.	Exclusive, Line 22		4	1
29.	Mixed, Line 26		1	0
30.	Total Michigan Special Passenger		5	1
31.	System Regular Passenger, Line 6	100.00	5,611	1,700
32.	Divided relatively with Account No. 394			
33.	Outside Michigan	16.55	929	281
34.	Michigan	83.45	4,682	1,419
35.	Michigan Regular Passenger, Line 34	100.00	4,682	1,419
36.	Divided relatively with Account No. 394			
37.	Mineral Range	5.22	244	74
38.	D. S. S. & A.	94.78	4,438	1,345

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 397—Water for Train Locomotives.
No. 398—Lublicants for Train Locomotives.
(Continued)

		%	No. 397 $	No. 398 $
39.	Michigan Freight Recap:			
40.	Regular, Line 10		7,488	2,269
41.	Mixed, Line 13		58	17
42.	Special, Line 25		5	2
43.	Total Michigan Freight		7,551	2,288
44.	Michigan Passenger Recap:			
45.	Mixed, Line 14		15	5
46.	Special, Line 30		5	1
47.	Regular, Line 38		4,438	1,345
48.	Total Michigan Passenger		4,458	1,351
49.	Michigan Passenger Line 48	100.00	4,458	1,351
50.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1b.			
51.	Sleepers and Diners	40.77	1,817	551
52.	Mail and Express	14.66	654	198
53	Passengers and Baggage	44.57	1,987	602
54.	Michigan Passengers and Baggage, Line 53	100.00	1,987	602
55.	Divided on Michigan Passenger Miles, Ratio No. 10			
56.	Interstate	29.71	590	179
57.	Intrastate	70.29	1,397	423

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 399, Other Supplies for Train Locomotives.

			%	$
1.	System Total, per Annual Report			3,202
2.	Divided to Services (Hillman data)			
3.	Mineral Range Passenger (all Michigan)			36
4.	Regular Freight			2,005
5.	Mixed (all Michigan)			20
6.	Special			2
7.	Regular Passenger			1,139
8.	System Regular Freight, Line 4		100.00	2,005
9.	Divided relatively with the total mileage of Regular Freight train Locomotives in and outside of Michigan	954,192		
10.	Outside Michigan	160,224	16.79	337
11.	Michigan	793,968	83.21	1,668
12.	Michigan Mixed, Line 5		100.00	20
13.	Divided relatively with the number of Freight and Passenger Cars in Mixed Trains.			
14.	Freight		79.30	16
15.	Passenger		20.70	4
16.	System Special, Line 6		100.00	2
17.	Divided relatively with the total mileage of Special Train Locomotives in and outside of Michigan	1,511		
18.	Outside Michigan	211	13.24	0
19.	Michigan	1,300	86.76	2
20.	Michigan Special, Line 19		100.00	2
21.	Divided relatively with the Michigan mileage of Special Train Locomotives in Mixed and Passenger Services	1,300		
22.	Mixed (all Freight)	827	63.62	1
23.	Passenger	473	36.38	1

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 399, Other Supplies for Train Locomotives (Continued)

			%	$
24.	System Regular, Passenger, Line 7.		100.00	1,139
25.	Divided relatively with the total mileage of Regular D. S. S. & A. Passenger train Locomotives in and outside of Michigan	934,837		
26.	Outside Michigan	161,788	17.31	197
27.	Michigan	773,049	82.69	942
28.	Michigan Freight Recap.:			
29.	Regular, Line 11			1,668
30.	Mixed, Line 14			16
31.	Special, Line 22			1
32.	Total Michigan Freight			1,685
33.	Michigan Passenger Recap.:			
34.	Mixed, Line 15			4
35.	Special, Line 23			1
36.	Regular, Line 27			942
37.	Total Michigan Passenger			947
38.	Michigan Passenger, Line 37		100.00	947
39.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1b.			
40.	Sleepers and Diners		40.77	386
41.	Mail and Express		14.66	139
42.	Passengers and Baggage		44.57	422
43.	Michigan Passengers and Baggage, Line 42		100.00	422
44.	Divided on Michigan Passenger miles, Ratio No. 10			
45.	Interstate		29.71	125
46.	Intrastate		70.29	297

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 400, Enginehouse Expenses—Train.

			%	$
1.	System Total, per Annual Report, $44,812; allocated to Michigan by Delf		100.00	38,019
2.	Divided relatively with Delf's assignment to Michigan Freight and Passenger in 1916	$39,329		
3.	Freight	22,930	58.30	22,165
4.	Passenger	16,399	41.70	15,854
5.	Michigan Passenger, Line 4		100.00	15,854
6.	Divided on Michigan Passenger Gross Ton miles, Ratio No. 1b.			
7.	Sleepers and Diners		40.41	6,407
8.	Mail and Express		13.81	2,189
9.	Passengers and Baggage		45.78	7,258
10.	Michigan Passengers and Baggage, Line 9		100.00	7,258
11.	Divided on Michigan Passenger Miles, Ratio No. 10			
12.	Interstate		29.71	2,156
13.	Intrastate		70.29	5,102

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 401—Trainmen.

			%	$
1.	System Total, per Annual Report			183,652
2.	Assigned to Services by Delf.			
3.	Freight			116,986
4.	Passenger			66,666
5.	System Freight, Line 3		100.00	116,986
6.	Divided relatively with the Total Mileage of Freight trains (including proportion of Mixed and Special) plus Train Switching in and outside of Michigan.	927,041		
7.	Outside Michigan	157,580	17.00	19,888
8.	Michigan	769,461	83.00	97,098
9.	System Passenger, Line 4		100.00	66,666
10.	Divided relatively with the Total Mileage of D.S.S.&A. Passenger Trains (including proportion of Mixed and Special plus Train Switching in and outside of Michigan, and on Mineral Range and D.S.S.&A.	957,319		
11.	Outside Michigan	158,357	16.54	11,026
12.	Michigan—Mineral Range	42,577(a)	4.45	2,967
13.	Michigan—D. S. S. & A.	756,385	79.01	52,673
14.	Mich. D.S.S.&A. Passenger, Line 13		100.00	52,673
15.	Divided on Passenger Trainmen's Payroll, Ratio No. 17a.			
16.	Conductors		53.27	28,059
17.	Brakemen		29.31	15,438
18.	Baggagemen (all Passengers and Baggage)		17.42	9,176
19.	Michigan Passenger Train Conductors, Line 16			28,059
20.	50% to Passengers and Baggage			14,030
21.	50% to Common Train Operation			14,029

No. 401—Trainmen (Continued).

		%	$
22.	Michigan Common Passenger Train Operation Recap:		
23.	Brakemen, Line 17		15,438
24.	50% Conductors, Line 21		14,029
25.	Total Michigan Common Passenger Train Operation		29,467
26.	Michigan Common Passenger Train Operation, Line 25	100.00	29,467
27.	Divided on Michigan D.S.S.&A. Passenger Train car miles, Ration No. 3a.		
28.	Sleepers and Diners	30.61	9,020
29.	Mail and Express	15.39	4,535
30.	Passengers and Baggage	54.00	15,912
31.	Michigan Passengers and Baggage Recap:		
32.	Baggagemen, Line 18		9,176
33.	50% Conductors, Line 20		14,030
34.	Common, Line 30		15,912
	Total Michigan Passengers and Baggage		39,118
36.	Michigan Passengers and Baggage, Line 35	100.00	39,118
37.	Divided on Michigan Passenger Miles, Ratio No. 10.		
38.	Interstate	29.71	11,622
39.	Intrastate	70.29	27,496

NOTE—(a) Locomotive miles D.S.S.&A. locomotives taken as train miles.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 402—Train Supplies and Expenses.

			%	$
1.	System Total, per Annual Report			36,619
2.	Assigned to Services by Delf.			
3.	Freight			8,826
4.	Passenger			27,793
5.	System Freight, Line 3		100.00	8,826
6.	Divided relatively with the Total Mileage of Freight Trains (including proportion of Mixed and Special) plus Train Switching in and outside of Michigan.	927,041		
7.	Outside Michigan	157,580	17.00	1,500
8.	Michigan	769,461	83.00	7,326
9.	System Passenger, Line 4.		100.00	27,793
10.	Divided relatively with the Total Mileage of D.S.S.&A. Passenger Trains (including proportion of Mixed and Special) plus Train Switching in and outside of Michigan	957,319		
11.	Outside Michigan	158,357	16.54	4,597
12.	Michigan—Mineral Range	42,577 (a)	4.45	1,237
13	Michigan—D.S.S.&A.	756,385	79.01	21,959
14.	Michigan D.S.S.&A. Passenger, Line 13		100.00	21,959
15.	Divided on Michigan D.S.S.&A. Passenger train car miles, Ratio No. 3a.			
16.	Sleepers and Diners		30.61	6,722
17.	Mail and Express		15.39	3,379
18	Passengers and Baggage		54.00	11,858
19.	Michigan Passengers and Baggage, Line 18		100.00	11,858
20.	Divided on Michigan Passenger Miles, Ratio No. 10.			
21.	Interstate		29.71	3,523
22.	Intrastate		70.29	8,335

NOTE—(a) Locomotive miles D.S.S.&A. locomotives taken as train miles.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 403—Operating Sleeping Cars.

	%	$
1. System Total, per Annual Report, $14,273; allocated to Michigan by Delf.		10,943

All Sleepers and Diners.

No. 404—Signal and Interlocker Operation.

	%	$
1. System Total, per Annual Report, $1241; allocated to Michigan by Delf.	100.00	41
2. Divided as per data on page following Account No. 405.		
3. Freight	94.76	39
4 Passenger	5.24	2
5. Michigan Passenger, Line 4	100.00	2
6. Divided on Michigan Total Passenger Train Car miles, Ratio No. 3.		
7. Sleepers and Diners	29.89	1
8. Mail and Express	15.00	0
9. Passengers and Baggage	55.11	1

Michigan Passengers and Baggage, all Intrastate.

NOTE—The Michigan portion of this charge is for Fuel, probably for Negaunee Semaphore.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 405—Crossing Protection.

		%	$
1.	System Totals, per Annual Report, $8,590; allocated to Michigan by Delf.	100.00	8,110
2.	Divided as per data on following page.		
3.	Freight	94.76	7,685
4.	Passenger	5.24	425
5.	Michigan Passenger, Line 4	100.00	425
6.	Divided on Michigan Total Passenger train car miles, Ratio No. 3.		
7.	Sleepers and Diners	29.89	127
8.	Mail and Express	15.00	64
9.	Passengers and Baggage	55.11	234
10.	Michigan Passengers and Baggage, Line 9	100.00	234
11.	Divided on Michigan Passenger miles, Ratio No. 10		
12.	Interstate	29.71	70
13.	Intrastate	70.29	164

NOTE—The Michigan portion of this charge is made up of the following:

Marquette	$4,544.45
St. Ignace	407.50
Ishpeming	1,420.10
Negaunee Semaphore	840.00
Negaunee Crossings	866.10
Fuel and Supplies	31.60
	$8,109.75

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

Data for Dividing Accounts Nos. 404 and 405.

Data is based on the following:

(a) An examination of the Despatcher's Daily Train Register for one week in July, 1915, and one week in January, 1916, from which we were able to ascertain the number of trains, class of service and approximate amount of time spent by each in the protected areas at Negaunee and Ishpeming, and the number and class of service of trains, entering and leaving Marquette and St. Ignace.

(b) The estimating of amounts of time for train and train locomotive movements, at Marquette and St. Ignace, for trains for which no other approximation of time could be had, as follows:

		Minutes
St. Ignace:	Passenger Trains East and West Bound in Yard Limits	2
	Passenger Locomotives to or from Roundhouse	2
	Freight Trains Departing	4
	Freight Locomotives to or from Roundhouse	2
Marquette:	Passenger Trains East or West Bound to and from Yard Limits	5
	Passenger Locomotives to or from Roundhouse	5
	Freight Trains East or West Bound Departures	5
	Freight Trains West Bound arrivals	10
	Freight Trains East Bound arrivals	20
	Freight Locomotives to or from Roundhouse	10
	Ore Trains, in or out	5
	Ore Trains Locomotives, all movements	10
Yard Switching at all points per statistical mile		10

		Minutes	%
Results	Passenger Time	5 481	5.24
	Freight Time	99 054	94.76
	Total	104 535	100.00

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 407, Telegraph and Telephone Operation.

			%	$
1.	System Total, per Annual Report		100.00	143
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 372 to 420 inclusive except 407 and 410 (see detail page following Account No. 371)	$1,108,929		
3.	Outside Michigan	173,852	15.68	22
4.	Michigan	935,077	84.32	121
5.	Michigan Total, Line 4		100.00	121
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$ 896,356		
7.	Freight	616,825	68.81	83
8.	Passenger	279,531	31.19	38
9.	Michigan Passenger, Line 8		100.00	38
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$ 279,531		
11.	Sleepers and Diners	96,122	34.39	13
12.	Mail and Express	34,616	12.38	5
13.	Passengers and Baggage	148,793	53.23	20
14.	Michigan Passengers and Baggage, Line 13		100.00	20
15.	Divided on Michigan Passenger miles, Ratio No. 10			
16.	Interstate		29.71	6
17.	Intrastate		70.29	14

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 410, Stationery and Printing.

			%	$
1.	System Total, per Annual Report		100.00	11,332
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 372 to 420 inclusive except 407 and 410 (see detail page following Account No. 371)	$1,108,929		
3.	Outside Michigan	173,852	15.68	1,777
4.	Michigan	935,077	84.32	9,555
5.	Michigan Total, Line 4		100.00	9,555
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$ 896,356		
7.	Freight	616,825	68.81	6,575
8.	Passenger	279,531	31.19	2,980
9.	Michigan Passenger, Line 8		100.00	2,980
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account 371)	$ 279,531		
11.	Sleepers and Diners	96,122	34.39	1,025
12.	Mail and Express	34,616	12.38	369
13.	Passengers and Baggage	148,793	53.23	1,586
14.	Michigan Passengers and Baggage, Line 13		100.00	1,586
15.	Divided on Michigan Passenger miles, Ratio No. 10			
16.	Interstate		29.71	471
17.	Intrastate		70.29	1,115

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 411, Other Expenses.

			%	$
1.	System Total, per Annual Report, $1,-160; allocated to Michigan			958
2.	Allocated to Services.			
3.	Freight			601
4.	Common Freight and Passenger			343
5.	Passenger			14
6.	Michigan Common, Line 4		100.00	343
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$896,356		
8.	Freight	616,825	68.81	236
9.	Passenger	279,531	31.19	107
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			601
12.	Common, Line 8			236
13.	Total Michigan Freight			837
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			14
16.	Common, Line 9			107
17	Total Michigan Passenger			121
18.	Michigan Passenger, Line 17		100.00	121
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$279,531		
20.	Sleepers and Diners	96,122	34.39	42
21.	Mail and Express	34,616	12.38	15
22.	Passengers and Baggage	148,793	53.23	64
23.	Michigan Passengers and Baggage, Line 22		100.00	64
24.	Divided on Michigan Passenger miles, Ratio No. 10.			
25.	Interstate		29.71	19
26.	Intrastate		70.29	45

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 412—Operating Joint Tracks and Facilities—Dr.

			%	$
1.	System Total, per Annual Report, $3,302; allocated to Michigan			936
2.	Allocated to Services.			
3.	Freight			741
4.	Common Freight and Passenger			76
5.	Passenger (Soo bridge)			119
6.	Michigan Common, Line 4		100.00	76
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account 371)	$896,356		
8.	Freight	616,825	68.81	52
9.	Passenger	279,531	31.19	24
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			741
12.	Common, Line 8			52
13.	Total Michigan Freight			793
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			119
16.	Common, Line 9			24
17.	Total Michigan Passenger			143
18.	Michigan Passenger, Line 17			143
19.	Allocated to Interstate Passengers and Baggage account of Soo Bridge			119
20.	Balance			24

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 412—Operating Joint Tracks and Facilities—Dr. (Continued).

			%	$
21.	Michigan Passenger, other than Soo Bridge, Line 20		100.00	24
22.	Divided relatively with the total of charges to Michigan Passengers Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$279,531		
23.	Sleepers and Diners	96,122	34.39	8
24.	Mail and Express	34,616	12.38	3
25.	Passengers and Baggage	148,793	53.23	13
26.	Michigan Passengers and Baggage, other than Soo Bridge, Line 25		100.00	13
27.	Divided on Michigan Passenger miles, Ratio No. 10			
28.	Interstate		29.71	4
29.	Intrastate		70.29	9
30.	Michigan Interstate Passengers and Baggage Recap.:			
31.	Soo Bridge, Line 19			119
32.	Other, Line 28			4
33.	Total Michigan Interstate Passengers and Baggage			123

NOTE—The Michigan Common portion of this Charge is made up of the following:

Joint Station, Sidnaw	$73.55
C.&N.W. Gates, Ishpeming	2.15
Total Michigan Common	$75.70

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 413—Operating Joint Tracks and Facilities—Cr.

			%	$
1.	System Total, per Annual Report, *$4,999; allocated to Michigan by Delf			*3,550
2.	Allocated to Services			
3.	Freight			*3,098
4.	Common Freight and Passenger			*664
5.	Passenger			*788
6.	Michigan Common, Line 4		100.00	*664
7.	Divided relatively with the total charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$896,356		
8.	Freight	616,825	68.81	*457
9.	Passenger	279,531	31.19	*207
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			*2,098
12.	Common, Line 8			*457
13.	Total Michigan Freight			*2,555
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			*788
16.	Common, Line 9			*207
17.	Total Michigan Passenger			*995

*Typewritten figures in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 413—Operating Joint Tracks and Facilities—Cr. (Continued).

			%	$
18.	Michigan Passenger, Line 18		100.00	*995
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$279,531		
20.	Sleepers and Diners	96,122	34.39	*342
21.	Mail and Express	34,616	12.38	*123
22.	Passengers and Baggage	148,793	53.23	*530
23.	Michigan Passsengers and Baggage, Line 22		100.00	*530
24.	Divided on Michigan Passenger miles, Ratio No. 10			
25.	Interstate		29.71	*157
26.	Intrastate		70.29	*373

*Typewritten figures in red.

NOTE—The Michigan Common portion of this charge is made up of the following:

Water Station, Michigamme	$222.18
Wages and Supplies at various Joint Stations	442.27
Total Michigan Common	$664.45

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 414—Insurance.

			%	$
1.	System Total, per Annual Report, $2,476; allocated to Michigan by Delf			1,374
2.	Allocated to Services by Delf			
3.	Freight			819
4.	Common Freight and Passenger			488
5.	Passenger			67
6.	Michigan Common, Line 4		100.00	488
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$896,356		
8.	Freight	616,825	68.81	336
9.	Passenger	279,531	31.19	152
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			819
12.	Common, Line 8			336
13.	Total Michigan Freight			1,155
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			67
16.	Common, Line 9			152
17.	Total Michigan Passenger			219
18.	Michigan Passenger, Line 17		100.00	219
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$279,531		
20.	Sleepers and Diners	96,122	34.39	75
21.	Mail and Express	34,616	12.38	27
22.	Passengers and Baggage	148,793	53.23	117
23.	Michigan Passengers and Baggage, Line 22		100.00	117
24.	Divided on Michigan Passenger miles, Ratio No. 10			
25.	Interstate		29.71	35
26.	Intrastate		70.29	82

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 415—Clearing Wrecks.

	%	$
1. System Total, per Annual Report, $1,287; allocated to Michigan by Delf	100.00	1,281

All freight (by Delf).

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 416—Damage to Property.

			%	$
1.	System Total, per Annual Report, $4,927; allocated to Michigan by Delf.			4,065
2.	Allocated to Services by Delf.			
3.	Freight			3,675
4.	Common Freight and Passenger			390
5	Michigan Common, Line 4		100.00	390
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371.)	$896,356		
7.	Freight	616,825	68.81	268
8.	Passenger	279,531	31.19	122
9.	Michigan Freight Recap:			
10.	Exclusive, Line 3			3,675
11.	Common, Line 7			268
12.	Total Michigan Freight			3,943
13.	Michigan Passenger, Line 8		100.00	122
14.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (See detail page following Account No. 371)	$279,531		
15.	Sleepers and Diners	96,122	34.39	42
16.	Mail and Express	34,616	12.38	15
17.	Passengers and Baggage	148,793	53.23	65
18.	Michigan Passengers and Baggage, Line 17		100.00	65
19.	Divided on Michigan Passenger miles, Ratio No. 10			
20.	Interstate		29.71	19
21.	Intrastate		70.29	46

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 417—Damage to Stock on Right-of-Way.

				%	$
1.	System Total, per Annual Report, $1,-511; allocated to Michigan by Delf.				809
2.	Allocated to Services by Delf.				
3.	Freight				72
4.	Common Freight and Passenger				46
5.	Passenger				691
6.	Michigan Common, Line 4			100.00	46
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (See detail page following Account No. 371.)	$896,356			
8.	Freight	616,825		68.81	32
9.	Passenger	279,531		31.19	14
10.	Michigan Freight Recap:				
11.	Exclusive, Line 3				72
12.	Common, Line 8				32
13.	Total Michigan Freight				104
14.	Michigan Passenger Recap:				
15.	Exclusive, Line 5				691
16.	Common, Line 9				14
17.	Total Michigan Passenger				705
18.	Michigan Passenger, Line 17			100.00	705
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (See detail page following Account No. 371)	$279,531			
20.	Sleepers and Diners	96,122		34.39	243
21.	Mail and Express	34,616		12.38	87
22.	Passengers and Baggage	148,793		53.23	375
23.	Michigan Passengers and Baggage, Line 22			100.00	375
24.	Divided on Michigan Passenger miles, Ratio No. 10				
25.	Interstate			29.71	111
26.	Intrastate			70.29	264

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 418—Loss and Damage—Freight.

	$
1. System Total Per Annual Report, $10,292; allocated to Michigan by Delf.	8,548

All Freight.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915

No. 419—Loss and Damage—Baggage.

		%	$
1.	System Total, per Annual Report, $282; allocated to Michigan by Delf (All Passengers and Baggage)		198
2.	Michigan Passengers and Baggage, Line 1	100.00	198
3.	Divided on Michigan Passenger Miles, Ratio No. 10		
4.	Interstate	29.71	59
5.	Intrastate	70.29	139

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915

No. 420, Injuries to Persons

			%	$
1.	System Total, per Annual Report, $23,-480; allocated to Michigan by Delf			20,836
2.	Allocated to Services by Delf.			
3.	Freight			17,003
4.	Common Freight and Passenger			257
5.	Passenger			3,576
6.	Michigan Common, Line 4		100.00	257
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$896,356		
8.	Freight	616,825	68.81	177
9.	Passenger	279,531	31.19	80
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			17,003
12.	Common, Line 8			177
13.	Total Michigan Freight			17,180
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			3,576
16.	Common, Line 9			80
17.	Total Michigan Passenger			3,656
18.	Michigan Passenger, Line 17		100.00	3,656
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$279,531		
20.	Sleepers and Diners	96,122	34.39	1,257
21.	Mail and Express	34,616	12.38	453
22.	Passengers and Baggage	148,793	53.23	1,946
23.	Michigan Passengers and Baggage, Line 22		100.00	1,946
24.	Divided on Michigan Passenger miles, Ratio No. 10.			
25.	Interstate		29.71	578
26.	Intrastate		70.29	1,368

VI. MISCELLANEOUS OPERATIONS

VI. MISCELLANEOUS OPERATIONS

No. 441—Dining and Buffet Service

	$
1. System Total, per Annual Report, $45,006; allocated to Michigan by Delf	36,478

All Sleepers and Diners

VII. GENERAL

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915

VII. GENERAL

No. 451—Salaries and Expenses of General Officers
No. 452—Salaries and Expenses of Clerks and Attendants
No. 453—General Office Supplies and Expenses

			%	451 $	452 $	453 $
1.	System Totals, per Annual Report		100.00	25,573	37,232	3,429
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following)	$2,263,660				
3.	Outside Michigan	394,723	17.44	4,460	6,493	598
4.	Michigan	1,868,937	82.56	21,113	30,739	2,831
5.	Michigan Totals, Line 4		100.00	21,113	30,739	2,831
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following)	$1,868,937				
7.	Freight	1,297,644	69.43	14,659	21,342	1,966
8.	Passenger	571,293	30.57	6,454	9,397	865
9.	Michigan Passenger, Line 8		100.00	6,454	9,397	865
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following)	$ 571,293				
11.	Sleepers and Diners	205,903	36.04	2,326	3,386	312
12.	Mail and Express	68,466	11.99	774	1,127	104
13.	Passengers and Baggage	296,924	51.97	3,354	4,884	449
14.	Michigan Passengers and Baggage, Line 13		100.00	3,354	4,884	449
15.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following)	$ 296,924				
16.	Interstate	100,925	33.99	1,140	1,660	153
17.	Intrastate	195,999	66.01	2,214	3,224	296

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

Details for dividing Accounts Nos. 451, 452, 453, 454, 455, 457, 458, 459, 460 and 461.

Acct.	System Total excluding Mineral Range	Outside Michigan	MICHIGAN (excluding Mineral Range)							
			Total	Freight	Passenger					
					Total	Sleepers & Diners	Mail & Express	Passengers & Baggage		
								Total	Inter-state	Intra-state
	$	$	$	$	$	$	$	$	$	$
I.	370,976	126,131	444,845	336,583	108,262	39,830	15,733	52,699	15,705	36,994
II.	422,647	65,181	357,466	262,432	95,034	29,423	16,635	48,976	14,550	34,426
III.	95,360	15,913	79,447	39,427	40,020			40,020	24,469	15,551
IV.	1,129,671	178,970	950,701	659,202	291,499	100,172	36,098	155,229	46,201	109,028
VI.	45,006	8,528	36,478		36,478	36,478				
Total	2,263,660	394,723	1,868,937	1,297,644	571,293	205,903	68,466	296,924	100,925	195,999

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 454—Law Expenses.

			%	$
1.	System Total, per Annual Report			39,025
2.	Less cost of this suit			28,884
3.	Balance			10,141
4.	System Total, other than cost of suit, Line 3		100.00	10,141
5.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,263,660		
6.	Outside Michigan	394,723	17.44	1,769
7.	Michigan	1,868,937	82.56	8,372
8.	Michigan Total, Line 7		100.00	8,372
9.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$1,868,937		
10.	Freight	1,297,644	69.43	5,813
11.	Passenger	571,293	30.57	2,559
12.	Michigan Passenger, Line 11		100.00	2,559
13.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 571,293		
14.	Sleepers and Diners	205,903	36.04	922
15.	Mail and Express	68,466	11.99	307
16.	Passengers and Baggage	296,924	51.97	1,330
17.	Michigan Passengers and Baggage, Line 16		100.00	1,330
18.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 296,924		
19.	Interstate	100,925	33.99	452
20.	Intrastate	195,999	66.01	878

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 455—Insurance.

			%	$
1.	System Total, per Annual Report		100.00	145
2.	Divided relatively with the total of charges to Michigan and Outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,263,660		
3.	Outside Michigan	394,723	17.44	25
4.	Michigan	1,868,937	82.56	120
5.	Michigan Total, Line 4		100.00	120
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$1,868,937		
7.	Freight	1,297,644	69.43	83
8.	Passenger	571,293	30.57	37
9.	Michigan Passenger, Line 8		100.00	37
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 571,293		
11.	Sleepers and Diners	205,903	36.04	13
12.	Mail and Express	68,466	11.99	4
13.	Passengers and Baggage	296,924	51.97	20
14.	Michigan Passengers and Baggage, Line 13		100.00	20
15.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 296,924		
16.	Interstate	100,925	33.99	7
17.	Intrastate	195,999	66.01	13

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 457—Pensions.

			%	$
1.	System Total, per Annual Report		100.00	720
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,263,660		
3.	Outside Michigan	394,723	17.44	126
4.	Michigan	1,868,937	82.56	594
5.	Michigan Total, Line 4		100.00	594
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$1,868,937		
7.	Freight	1,297,644	69.43	412
8.	Passenger	571,293	30.57	182
9.	Michigan Passenger, Line 8		100.00	182
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 571,293		
11.	Sleepers and Diners	205,903	36.04	66
12.	Mail and Express	68,466	11.99	22
13.	Passengers and Baggage	296,924	51.97	94
14.	Michigan Passengers and Baggage, Line 13		100.00	94
15.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 296,924		
16.	Interstate	100,925	33.99	32
17.	Intrastate	195,999	66.01	62

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 458—Stationery and Printing.

			%	$
1.	System Total, per Annual Report		100.00	4,912
2.	Divided relatively with the total of charges to Michigan and Outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,263,660		
3.	Outside Michigan	394,723	17.44	857
4.	Michigan	1,868,937	82.56	4,055
5.	Michigan Total, Line 4		100.00	4,055
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$1,868,937		
7.	Freight	1,297,644	69.43	2,815
8.	Passenger	571,293	30.57	1,240
9.	Michigan Passenger, Line 8		100.00	1,240
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 571,293		
11.	Sleepers and Diners	205,903	36.04	447
12.	Mail and Express	68,466	11.99	149
13.	Passengers and Baggage	296,924	51.97	644
14.	Michigan Passengers and Baggage, Line 13		100.00	644
15.	Divided relatively with the total of charges to Michigan Iinterstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 296,924		
16.	Interstate	100,925	33.99	219
17.	Intrastate	195,999	66.01	425

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915

No. 459—Valuation Expenses

			%	$
1.	System Total, per Annual Report		100.00	5,304
2.	Divided relatively with the total mileage of all D. S. S. & A. Tracks in and outside of Michigan	778.05		
3.	Outside Michigan	126.46	16.51	876
4.	Michigan	649.59	83.49	4,428
5.	Michigan Total, Line 4		100.00	4,428
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$1,868,937		
7.	Freight	1,297,644	69.43	3,074
8.	Passenger	571,293	30.57	1,354
9.	Michigan Passenger, Line 8		100.00	1,354
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 571,293		
11.	Sleepers and Diners	205,903	36.04	488
12.	Mail and Express	68,466	11.99	162
13.	Passengers and Baggage	296,924	51.97	704
14.	Michigan Passengers and Baggage, Line 13		100.00	704
15	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 296,924		
16.	Interstate	100,925	33.99	239
17.	Intrastate	195,999	66.01	465

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915

No. 460—Other Expenses

			%	$
1.	System Total, per Annual Report			5,077
2.	Allocated to States by Delf.			
3.	Outside Michigan			33
4.	Common Michigan and Outside Michigan			3,631
5.	Michigan			1,413
6.	Common Michigan and Outside Michigan, Line 4		100.00	3,631
7.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,263,660		
8.	Outside Michigan	394,723	17.44	633
9.	Michigan	1,868,937	82.56	2,998
10.	Exclusive Michigan, Line 5			1,413
11.	Allocated to Services by Delf.			
12.	Freight			26
13.	Common Freight and Passenger			1,371
14.	Passenger			16
15.	Michigan Common Recap.:			
16.	Common Michigan and Outside Michigan, Line 9			2,998
17.	Exclusive Michigan, Line 13			1,371
18.	Total Michigan Common			4,369
19.	Michigan Common, Line 18		100.00	4,369
20.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$1,868,937		
21.	Freight	1,297,644	69.43	3,033
22.	Passenger	571,293	30.57	1,336

No. 460—Other Expenses (Continued)

			%	$
23.	Michigan Freight Recap.:			
24.	Exclusive, Line 12			26
25.	Common, Line 21			3,033
26.	Total Michigan Freight			3,059
27.	Michigan Passenger Recap.:			
28.	Exclusive, Line 14			16
29.	Common, Line 22			1,336
30.	Total Michigan Passenger			1,352
31.	Michigan Passenger, Line 30		100.00	1,352
32.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 571,293		
33.	Sleepers and Diners	205,903	36.04	487
34.	Mail and Express	68,466	11.99	162
35.	Passengers and Baggage	296,924	51.97	703
36.	Michigan Passengers and Baggage, Line 35		100.00	703
37.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 296,924		
38.	Interstate	100,925	33.99	239
39.	Intrastate	195,999	66.01	464

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

No. 461—General Joint Facilities—Dr.

			%	$
1.	System Total, per Annual Report, $451; allocated to Michigan by Delf.			112
2.	Allocated to Services.			
3.	Freight			61
4.	Passenger			51
5.	Michigan Passenger, Line 4			51
6.	Allocated to Interstate Passengers and Baggage, Account of Soo Bridge			10
7.	Balance			41
8.	Michigan Passenger, other than Soo Bridge Line 7		100.00	41
9.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	571,293		
10.	Sleepers and Diners	205,903	36.04	15
11.	Mail and Express	68,466	11.99	5
12.	Passengers and Baggage	296,924	51.97	21
13.	Michigan Passengers and Baggage, other than Soo Bridge, Line 12		100.00	21
14.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$296,924		
15.	Interstate	100,925	33.99	7
16.	Intrastate	195,999	66.01	14
17.	Michigan Interstate Passengers and Baggage Recap:			
18.	Soo Bridge, Line 6			10
19.	Other, Line 15			7
20.	Total Michigan Interstate Passengers and Baggage.			17

Apportionments of Primary Expense Accounts

Summary.

Summary of Apportionment of Primary Expense Accounts.

Account.	System Total.	Michigan								
		Total.	Freight	Mineral Range Passenger.	D. S. S. & A.			Passenger.		
					Total.	Sleepers & Diners	Mail & Express	Passengers and Baggage.		
								Total	Interstate	Intrastate
1. MAINTENANCE OF WAY AND STRUCTURES:										
	$	$	$	$	$	$	$	$	$	$
201 Superintendence	22,331	17,371	12,806		4,565	1,680	664	2,221	660	1,561
202 Roadway Maintenance	47,209	39,269	30,048		9,221	2,756	1,383	5,082	1,510	3,572
208 Bridges, Trestles and Culverts	86,936	39,368	28,732		10,636	3,179	1,595	5,862	1,742	4,120
212 Ties	95,352	79,393	58,018		21,375	8,563	3,099	9,713	2,886	6,827
214 Rails	20,682	19,782	14,456		5,326	2,134	772	2,420	719	1,701
216 Other Track Material	23,469	21,806	15,935		5,871	2,352	851	2,668	793	1,875
218 Ballast	10,362	9,703	7,091		2,612	1,046	379	1,187	353	834
220 Track Laying and Surfacing	178,067	145,548	106,362		39,186	15,698	5,682	17,806	5,290	12,516
221 Right of Way Fences	5,616	3,309	2,532		777	232	117	428	127	301
223 Snow and Sand Fences and Snowsheds	244	199	152		47	14	7	26	8	18
225 Crossings and Signs	1,656	1,304	997		307	92	46	169	50	119
227 Station and Office Buildings	7,089	6,409	4,452		1,957	0	196	1,761	523	1,238
229 Roadway Buildings	1,933	1,193	872		321	129	46	146	43	103
231 Water Stations	5,065	4,286	2,824		1,462	597	213	652	194	458
233 Fuel Stations	2,581	2,184	1,439		745	304	109	332	99	233
235 Shops and Enginehouses	3,519	3,059	2,112		947	346	144	457	136	321
241 Wharves and Docks	884	884	693		191	63	25	103	31	72
243 Coal & Ore Wharves	2,091	2,091	2,091							
244 Coal & Ore Wharves—Depreciation	19,146	19,146	19,146							
247 Telegraph & Telephone Lines	2,857	2,440	1,824		616	184	92	340	101	239
249 Signal and Interlockers	492	198	188		10	3	1	6	2	4
267 Paving	8	8	6		2	1	0	1	0	1
269 Roadway Machines	845	657	484		173	64	25	84	25	59
271 Small Tools and Supplies	7,954	6,187	4,561		1,626	599	236	791	235	556
272 Removing Snow, Ice and Sand	21,306	20,060	15,898		4,162	1,244	624	2,294	682	1,612
273 Assessments for Public Improvement	233	99	73		26	9	4	13	4	9
274 Injuries to Persons	2,826	1,810	1,341		469	173	68	228	68	160
275 Insurance	4,532	3,979	3,207		772	284	112	376	112	264
276 Stationery and Printing	713	555	409		146	54	21	71	21	50

THIS PAGE BOUND

Summary of Apportionment of Primary Expense Accounts (Continued).

Account.	System Total.	Michigan								
		Total.	Freight	Mineral Range Passenger.	D. S. S. & A. Total.	D. S. S. & A. Sleepers & Diners	D. S. S. & A. Mail & Express	Passenger. Passengers and Baggage. Total	Passengers and Baggage. Interstate	Passengers and Baggage. Intrastate
I. MAINTENANCE OF WAY AND STRUCTURES (Continued)										
277 Other Expenses	$ 105	$ 82	$ 60	$	$ 22	$ 8	$ 3	$ 11	$ 3	$ 8
278 Maintaining Jt. Tracks, Yards and Other Facilities—Dr.	8,505	6,098	5,472		626	206	82	338	146	192
279 Maintaining Jt. Tracks, Yards and Other Facilities—Cr.	*13,632	*13,632	*7,698		*5,934	*2,184	*863	*2,887	*858	*2,029
Total Maintenance of Way and Structures	570,976	444,845	336,583		108,262	39,830	15,733	52,699	15,705	36,994
II. MAINTENANCE OF EQUIPMENT:										
301 Superintendence	12,520	10,617	7,397	140	3,080	889	556	1,635	486	1,149
302 Shop Machinery	6,694	5,677	4,008		1,669	482	301	886	263	623
308 Steam Locomotives—Repairs	93,458	79,741	46,017	1,290	32,434	13,215	4,722	14,497	4,307	10,190
309 Steam Locomotives—Depreciation	23,945	20,641	14,577	293	5,771	2,349	836	2,586	768	1,818
310 Steam Locomotives—Retirements	*233	*187	*188		1	1	0	0	0	0
314 Freight Train Car—Repairs	146,912	125,816	125,816							
315 Freight Train Car—Depreciation	62,766	53,753	53,753							
316 Freight Train Car—Retirements	2,151	1,842	1,842							
317 Pass. Train Car—Repairs	50,303	41,350	0	2,021	39,329	7,391	8,272	23,666	7,031	16,635
318 Pass. Train Car—Depreciation	12,367	10,070	0	358	9,712	4,055	1,465	4,192	1,245	2,947
326 Work Equipment—Repairs	5,735	4,445	3,288		1,157	433	169	555	165	390
327 Work Equipment—Depreciation	3,498	2,711	2,005		706	264	103	339	101	238
328 Work Equipment—Retirements	320	248	183		65	24	10	31	9	22
332 Injuries to Persons	2,831	2,413	2,067		346	100	62	184	55	129
333 Insurance	1,789	1,510	1,018		492	142	89	261	78	183
334 Stationery and Printing	1,191	934	659		275	79	50	146	43	103
336 Maintaining Joint Equipment at Terminals—Dr.	605	0								
337 Maintaining Joint Equipment at Terminals—Cr.	*13	*13	*10		*3	*1	*0	*2	*1	*1
Total Maintenance of Equipment	426,749	361,568	262,432	4,102	95,034	29,423	16,635	48,976	14,550	34,426

*Typewritten in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

Summary of Apportionment of Primary Expense Accounts (Continued).

Account.	System Total.	Michigan								
		Total.	Freight	Mineral Range Passenger.	D. S. S. & A. Total.	D. S. S. & A. Sleepers & Diners	D. S. S. & A. Mail & Express	Passenger. Passengers and Baggage. Total	Passenger. Passengers and Baggage. Interstate	Passenger. Passengers and Baggage. Intrastate
III. TRAFFIC:	$	$	$	$	$	$	$	$	$	$
351 Superintendence	31,298	25,938	14,208		11,730	0	0	11,730	3,485	8,245
352 Outside Agencies	37,255	30,855	13,025		17,830			17,830	16,409	1,421
353 Advertising	4,549	3,760	33		3,727			3,727	2,574	1,153
354 Traffic Association	346	287	287							
355 Fast Freight Lines	5	5	5							
356 Industrial Immigration Bureaus	9,456	8,307	5,456		2,851			2,851	487	2,004
357 Insurance	101	56	0		56			56	17	39
358 Stationery and Printing	12,350	10,239	6,413		3,826			3,826	1,137	2,689
Total Traffic	95,360	79,447	39,427		40,020			40,020	24,469	15,551
IV. TRANSPORTATION—RAIL LINE:										
371 Superintendence	21,469	18,150	12,981	190	4,979	1,687	631	2,661	791	1,870
372 Despatching Trains	12,821	10,952	8,185		2,767	827	415	1,525	453	1,072
373 Station Employees	155,950	138,098	116,252		21,846		2,185	19,661	5,841	13,820
374 Weighing, Inspection and Demur. Bu.	1,621	1,347	1,347							
375 Coal and Ore Wharves	16,704	16,704	16,704							
376 Station Supplies & Expenses	10,490	9,289	7,819		1,470			1,470	437	1,033
377 Yard Masters & Yard Clerks	4,705	4,705	4,546		159	80	8	71	21	50
378 Yard Conductors & Brakemen	37,207	37,207	35,949		1,258	636	63	559	166	393
379 Yard Switch & Signal Tenders	3,992	3,992	3,857		135	68	7	60	18	42
380 Yard Enginemen	23,842	23,842	23,036		806	408	40	358	106	252
382 Fuel for Yard Locomotives	21,417	21,417	20,693		724	366	36	322	96	226
385 Water for Yard Locomotives	1,213	1,213	1,172		41	21	2	18	5	13
386 Lubricants for Yard Locomotives	338	338	327		11	6	1	4	1	3
387 Other Supplies for Yard Locomotives	380	380	367		13	7	1	5	1	4
388 Enginehouse Expenses—Yard	12,912	12,912	12,523		389	197	19	173	51	122
389 Yard Supplies & Expenses	1,290	1,290	1,246		44	22	2	20	6	14

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

Summary of Apportionment of Primary Expense Accounts (Continued).

Account.	System Total.	Michigan								
		Total.	Freight	Mineral Range Passenger.	D. S. S. & A. Total.	D. S. S. & A. Sleepers & Diners	D. S. S. & A. Mail & Express	Passenger. Passengers and Baggage. Total	Passenger. Passengers and Baggage. Interstate	Passenger. Passengers and Baggage. Intrastate
IV. TRANSPORTATION—RAIL LINE—(Continued).										
	$	$	$	$	$	$	$	$	$	$
390 Operating Jt. Yards and Terminals—Dr.	38,694	17,081	10,143		6,938	2,829	1,017	3,092	919	2,173
391 Operating Jt. Yards and Terminals—Cr.	*13,579	*13,579	*11,730		*1,849	*754	*271	*824	*245	*579
392 Train Enginemen	155,965	130,186	72,421	3,002	54,763	22,327	8,028	24,408	7,252	17,156
394 Fuel for Train Locomotives	267,712	223,241	137,583	4,452	81,206	33,108	11,905	36,193	10,753	25,440
397 Water for Train Locomotives	14,695	12,253	7,551	244	4,458	1,817	654	1,987	590	1,397
398 Lubricants for Train Locomotives	4,453	3,713	2,288	74	1,351	551	198	602	179	423
399 Other Supplies for Train Locomotives	3,202	2,603	1,685	36	947	386	139	422	125	297
400 Enginehouse Expense—Train	44,812	38,019	22,165		15,854	6,407	2,189	7,258	2,156	5,102
401 Trainmen	183,652	152,738	97,098	2,967	52,673	9,020	4,535	39,118	11,622	27,496
402 Train Supplies and Expenses	26,619	30,522	7,326	1,237	21,959	6,722	3,379	11,858	3,523	8,335
403 Operating Sleeping Cars	14,273	10,943			10,943	10,943				
404 Signals and Interlocker Op.	1,241	41	39		2	1		1		1
405 Crossing Protection	8,590	8,110	7,685		425	127	64	234	70	164
407 Telegraph and Telephone Op.	143	121	83		38	13	5	20	6	14
410 Stationery and Printing	11,332	9,555	6,575		2,980	1,025	369	1,586	471	1,115
411 Other Expenses	1,160	958	837		121	42	15	64	19	45
412 Op. Joint Trks. & Facilities—Dr.	3,302	936	793		143	8	3	132	123	9
413 Op. Joint Trks. & Facilities—Cr.	*4,999	*3,550	*2,555		*995	*342	*123	*530	*157	*373
414 Insurance	2,476	1,374	1,155		219	75	27	117	35	82
415 Clearing Wrecks	1,287	1,281	1,281							
416 Damage to Property	4,927	4,065	3,943		122	42	15	65	19	46
417 Damage to Stock on Rt.-of-Way	1,511	809	104		705	243	87	375	111	264
418 Loss and Damage—Freight	10,292	8,548	8,548							
419 Loss and Damage—Baggage	282	198			198			198	59	139
420 Injuries to Persons	23,480	20,836	17,180		3,656	1,257	453	1,946	578	1,368
Total Transportation—Rail Line	1,141,873	962,902	659,202	12,202	291,499	100,172	36,098	155,229	46,201	109,028

*Typewritten in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

Summary of Apportionment of Primary Expense Accounts (Continued).

Account.	System Total.	Michigan								
		Total.	Freight	Mineral Range Passenger.	D. S. S. & A. Total.	D. S. S. & A. Sleepers & Diners	D. S. S. & A. Mail & Express	Passenger. Passengers and Baggage. Total	Passenger. Passengers and Baggage. Interstate	Passenger. Passengers and Baggage. Intrastate
VI. MISCELLANEOUS OPERATION:	$	$	$	$	$	$	$	$	$	$
441 Dining and Buffet Service	45,006	36,478			36,478	36,473				
VII. GENERAL:										
451 Salaries and Exp. of Gen. Office	25,577	21,113	14,659	0	6,454	2,326	774	3,354	1,140	2,214
452 Salaries & Exp. of Clerks & Attendants	37,232	30,739	21,342		9,397	3,386	1,127	4,884	1,660	3,224
453 Gen. Office Supplies & Exp.	3,429	2,831	1,966		865	312	104	449	153	296
454 Law Expenses	10,141a	8,372	5,813		2,559	922	307	1,330	452	878
455 Insurance	145	120	83		37	13	4	20	7	13
457 Pensions	720	594	412		182	66	22	94	32	62
458 Stationery & Printing	4,912	4,055	2,815		1,240	447	149	644	219	425
459 Valuation Expenses	5,304	4,428	3,074		1,354	488	162	704	239	465
460 Other Expenses	5,077	4,411	3,059		1,352	487	162	703	239	464
461 General Joint Facilities—Dr.	451	112	61		51	15	5	31	17	14
Total General	92,984	76,775	53,284		23,491	8,462	2,816	12,213	4,158	8,055
RECAPITULATION:										
I. Maintenance of Way & Structs.	570,976	444,845	336,583		108,262	39,830	15,733	52,609	15,705	36,994
II. Maintenance of Equipment	426,749	361,568	262,432	4,102	95,034	29,423	16,635	48,976	14,550	34,426
III. Traffic	95,360	79,447	39,427		40,020			40,020	24,469	15,551
IV. Transportation	1,141,873	962,902	659,202	12,202	291,499	100,172	36,098	155,229	46,201	109,028
VI. Miscellaneous Operations	45,006	36,478			36,478	36,478				
VII. General	92,984	76,775	53,284		23,491	8,462	2,816	12,213	4,158	8,055
Grand Total	2,372,948	1,962,016	1,350,928	16,304	594,784	214,365	71,282	309,137	105,083	204,054

(a) This amount excludes, on account of cost of this suit, $28,884.

Apportionments of Revenues.

Details and Summary.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Fiscal Year 1915.

Summary of Railway Operating Revenue Accounts.

Account.	System Total.	Michigan								
		Total.	Freight	Mineral Range Passenger	D. S. S. & A. Total.	D. S. S. & A. Sleepers & Diners	D. S. S. & A. Mail & Express	Passenger. Passengers and Baggage. Total	Interstate	Intrastate
RAILWAY OPERATING REVENUES:	$	$	$	$	$	$	$	$	$	$
101 Freight	1,813,059	1,603,110	1,603,110							
102 Passenger	857,607	746,872			746,872			746,872	216,824	530,048
103 Excess Baggage	7,895	7,291			7,291			7,291	2,864	4,427
104 Sleeping Car	36,033	27,734			27,734	27,734				
105 Parlor and Chair Car	4,022	4,022			4,022	4,022				
106 Mail	67,499	54,521			54,521		54,521			
107 Express	29,502	26,863			26,863		26,863			
108 Other Passenger Train	2,045	1,767		186	1,581			1,581	435	1,146
109 Milk	491	128			129			129		129
110 Switching	19,621	10,134	10,134							
111 Special Service Train	2,952	2,658	1,625		1,033			1,033	278	755
112 Other Freight Train	7	7	7							
131 Dining and Buffet Service	35,839	28,284			28,284	28,284				
133 Station Train and Boat Service	600	495			495			495	144	351
134 Parcel Room	449	449			449			449	130	319
135 Storage Freight	1,744	1,682	1,682							
136 Storage Baggage	87	87			87			87	25	62
137 Demurrage	3,386	3,017	3,017							
138 Telegraph and Telephone Service	637	621	402		219			219	64	153
142 Rents of Bldgs. and Other Property	7,757	7,558	6,811		747			747	217	530
143 Miscellaneous	39,698	39,488	38,139					1,349	392	957
151 Joint Facilities—Cr.	6,521	2,318	1,168		1,150			1,150	427	723
152 Joint Facilities—Dr.	*13	*13			*13			*13	*4	*9
	2,937,438	2,569,094	1,666,095	186	902,813	60,040	81,384	761,389	221,796	539,593

NOTE—Account No. 108. Of the total Michigan portion of the account $1,380 is on account of C., M. & St. P. trains for 92 days' operation. This has been credited as follows:

25% to Maintenance of Way, D., S. S. & A. tracks	$345.00
75% to Train Movement, of which 14/78 credited to Mineral Range	186.00
64/68 credited to D., S. S. & A.	849.00

Account No. 142. Excludes $1,159 claimed to be received from non-operated property which was not inventoried. (See Delf. Exhibits.)

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Fiscal Year 1915.

INCOME ACCOUNT.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

The presentation of the following computations of income is not intended to waive the claim that the passenger earnings of the Mackinaw Transportation Company are to be added to the net corporate income of the passenger business, particularly if sleeping car and dining car operations are to be included.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

Joint Facilities—Income Cr.
Michigan.

	Michigan Total	Michigan Freight	Michigan Passenger	Michigan Common
	$	$	$	$
Main Line, C.& N.W. Frts. Michigamme to Beaufort.	2,816.95			2,816.95
Main Line, Ishpeming to Marquette, C.& N.W.	1,047.17		1,047.17	
Main Line, Negaunee to Calumet, C.& N.W.	6,528.91		6,528.91	
Main Line, Champion to Calumet, C.M.& St.P.	3,071.25		3,071.25	
Main Line, Houghton to Pilgrim, M. R. Frts.	4,135.20			4,135.20
Baraga to Zenith Junction Frts.	1,775.00			1,775.00
Mine Yards, L.S.& I. Switch Engine	1,208.88	1,208.88		
Land—Negaunee Union Depot—Passenger	150.00		150.00	
Union Depot Tracks, C.& N.W.Ry.	57.00			57.00
Enginehouse Houghton	124.40	124.40		
	20,914.76	1,333.28	10,797.33	8,784.15
Common to Frt. 64.75%, Pass. 35.25%		5,687.74	3,096.41	
	20,914.76	7,021.02	13,893.74	
28/191 of C.& N.W. to Mineral Range	957.12		957.12	
14/78 of C.M.& St.P. to Mineral Range	521.25		521.25	
	1478.37		1,478.37	
	19,436.39	7,021.02	12,415.37	
Michigan Passenger Intra—70.97%			8,811.19	
Inter—29.03			3,604.18	

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

Taxes.

			%	$
1.	System Total, per Annual Report	$197,313		
2.	Specific Tax on Sleeping Car Tickets	139		
		$197,174		
3.	Michigan Total, per Annual Report			178,242
4.	Specific Tax on Sleeping Car Tickets			115
				178,127
5.	Michigan Taxes assigned to Services relatively with the allocation and assignment of the Operating Expenses.	$1,962,016	100.00	178,127
6.	Freight	1,350,928	68.86	122,659
7.	Mineral Range Passenger	16,304	.83	1,478
8.	DSS&A Passenger	594,784	30.31	53,990
9.	D. S. S. & A. Passenger	$ 594,784	100.00	53,990
10.	Sleepers and Diners	214,365	36.04	19,458
11.	Mail and Express	71,282	11.98	6,468
12.	Passengers and Baggage	309,137	51.98	28,064
13.	Sleeper and Diner Recap:			
14.	Amount from Line 4			115
15.	Amount from Line 10			19,458
				19,573
16.	Passengers and Baggage	$ 309,137	100.00	28,064
17.	Interstate	105,083	33.99	9,539
18.	Intrastate	204,054	66.01	18,525

The above assignment of taxes is for temporary use.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

Hire of Equipment.

		System	Michigan	Michigan Freight	Michigan Passenger	Passengers & Baggage	Sleepers & Diners
RENT RECEIVED FOR HIRE OF EQUIPMENT:							
Locomotives leased to Soo Bridge Account	(a)	$7,595.00	$6,442.08	$5,248.36	$1,193.72	$	$
Locomotives, Freight to others		80.42	65.75	65.75			
Locomotives, Passenger to Others		365.29	298.66		298.66		
Locomotives, Switch to Others		132.00	107.92	104.57	3.35		
		8,172.71	6,914.41	5,418.68	1,495.73		
Passenger Train Cars		368.18	300.92		300.92		
Work Equipment	(b)	944.00	812.27	211.52	600.75		
		9,534.89	8,027.60	5,630.20	2,397.40	2,397.40	
				39.03 Interstate	695.97		
				70.97 Interstate	1,701.43		
RENT PAID FOR EQUIPMENT:							
For Freight Cars (Balance)		1,534.58	1,256.97	1,256.97			
For Locomotives		448.64	367.48	354.82	12.66	12.66	
For Passenger Train Cars		643.54	527.11		527.11	527.11	
For Sleepers		1,586.28	1,299.34		1,299.34		1,299.34
For Work Equipment	(b)	54.50	44.64	11.62	33.02	33.02	
		$4,267.50	$3,495.54	$1,623.41	$1,872.13	$ 572.79	$1,299.34
				29.03 Interstate		166.28	
				70.97 Intrastate		406.51	

Figures are the same as Delf's with the following exceptions:
(a) On the basis of use by the D. S. Repairs; Passenger, 26.04%; Freight, 73.96%.
(b) On the basis of Work Equipment S. & A.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1915.

Income Account.

		System Total	MICHIGAN							
			Total	Freight	Mineral Range Passenger	D. S. S. & A. PASSENGER. Total	Sleepers and Diners	Mail and Express	Passengers and Baggage Total	Passengers and Baggage Inter-state	Passengers and Baggage Intra-state
Railway Operating Revenues		$2,937,438	$2,569,094	$1,666,095	$ 186	$902,813	$ 60,040	$81,384	$761,389	$221,796	$539,593
Railway Operating Expenses		2,372,948	1,962,016	1,350,928	16,304	594,784	214,365	71,282	309,137	105,083	204,054
		$ 564,490	607,078	315,167	*16,118	308,029	*154,325	10,102	452,252	116,713	335,539
Additions:											
Rents from Hire of Equipment	(a)	9,535	8,028	5,630		2,398			2,398	696	1,702
Joint Facilities—Cr.	(b)	20,915	20,915	7,021	1,479	12,415			12,415	3,604	8,811
Interest		3,972	3,248	2,103		1,145			1,145	332	813
		$ 598,912	639,269	329,921	*14,639	323,987	*154,325	10,102	468,210	121,345	346,865
Deductions:											
Joint Facilities—Dr.		36,688	9,052	7,159		1,893			1,893	903	990
Miscellaneous Rents		42	42	42							
Rent paid for Hire of Equipment	(a)	4,268	3,496	1,624		1,872	1,299		573	166	407
Taxes	(c)	197,313	178,242	122,659	1,478	54,105	19,573	6,468	28,064	9,539	18,525
		$ 238,311	190,832	131,484	1,478	57,870	20,872	6,468	30,530	10,608	19,922
Net Corporate Income		$ 360,601	448,437	198,437	*16,117	266,117	*175,197	3,634	437,680	110,737	326,943

(a) Details on third preceding page.
(b) Details on second preceding page.
(c) Details on first preceding page.

DULUTH SOUTH SHORE & ATLANTIC

RATE CASE

Cost of Passenger Service,

Fiscal Year 1916.

RATIOS

AND OTHER DATA

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Ratio No. 1—Michigan Gross Ton Miles on Common Tracks.

	Total	Freight	Passenger
Freight:			
Freight Train Cars	284,135,206	284,135,206	
Train Load	245,188,330	245,188,330	
Locomotives	94,579,388	94,579,388	
Yard Swit'g on Common Tracks	28,575,038	28,575,038	
Train Swit'g on Common Tracks	12,751,838	12,751,838	
Passenger:			
Passenger Train Cars	166,323,158		166,323,158
Train Loads	7,831,580		7,831,580
Locomotives	83,048,379		83,048,379
Yard Swit'g on Common Tracks	461,944		461,944
Train Swit'g on Common Tracks	346,264		346,264
Totals	923,241,125	665,239,800	258,011,325
Percents	100.00	72.06	27.94

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Ratio No. 1a—Michigan Passenger Gross Ton Miles.

	Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
Passenger Train Cars	166,323,158	68,666,360	21,836,442	75,820,356
Train Load	7,831,580		3,379,268	4,452,312
Locomotives (a)	83,048,379	32,745,976	12,025,405	38,276,998
Yard Switching	461,944	293,196	18,339	150,409
Train Switching	346,264		57,711	288,553
Total	258,011,325	101,705,532	37,317,165	118,988,628
Percent	100.00	39.42	14.46	46.12

a) Apportioned relatively with the ton miles of Passenger Train Cars and Loads as follows:

	Car Ton Miles	Load Ton Miles	Total Ton Miles	Per Cent	Locomo've Ton Miles
Sleepers & Diners	68,666,360		68,666,360	39.43	32,745,976
Mail & Express	21,836,442	3,379,268	25,215,710	14.48	12,025,405
Passengers & Bag'ge	75,820,356	4,452,312	80,272,668	46.09	38,276,998
Total	166,323,158	7,831,580	174,154,738	100.00	83,048,379

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Ratio No. 1b—Michigan Gross Ton Miles of Passenger Trains Operated on the D.S.S.&A. by the D.S.S.&A.

	Total	Sleepers and Diners	Mail and Express	Passengers and Baggage
Passenger Train Cars	162,499,191	68,346,620	21,813,564	72,339,007
Train Load	7,514,540		3,062,228	4,452,312
Locomotives (a)	80,512,059	32,365,848	11,778,914	36,367,297
Totals	250,525,790	100,712,468	36,654,706	113,158,616
Percent	100.00	40.20	14.63	45.17

(a) Apportioned relatively with the ton miles of Passenger Train Cars and Loads as follows:

	Car Ton Miles	Load Ton Miles	Total Ton Miles	Per Cent	Locomotive Ton miles
Sleepers and Diners	68,346,620		68,346,620	40.20	32,365,848
Mail and Express	21,813,564	3,062,228	24,875,792	14.63	11,778,914
Pas'gers and Bag'ge	72,339,007	4,452,312	76,791,319	45.17	36,367,297
	162,499,191	7,514,540	170,014,731	100.00	80,512,059

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Ratio No. 2—Michigan Equated Track Miles of Tracks Maintained by the D. S. S. & A.

	Actual Mileage				Equated Mileage.			
	Total	Freight	Common	Passenger	Total	Freight	Common	Passenger
Main Line	420.92	12.07	408.85		420.92	12.07	408.85	
Second Track	6.55		6.55		6.55		6.55	
Spurs, Industrial	21.43	21.43			10.76	10.76		
Spurs, Mines	21.57	21.57			10.79	10.79		
Sidings	156.73	114.01	40.62	2.10		57.01	20.31	1.05
Totals	627.20	169.08	456.02	2.10	78.37	90.63	435.71	1.05
Percents					100.00	17.18	82.62	0.20

NOTE:—
The above equation on the following basis:

Main and Second Tracks	1.00
Spurs and Sidings	.50

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Ratio No. 3—Michigan Passenger Train Car Miles Including C. M. & St. P and C. & N. W. into Marquette.

	Total Car Miles		Michigan	
	Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
Passenger Cars	1,691,425		23,224	1,668,201
Passenger Cars, Special	5,251			5,251
Other Passenger Train Cars	844,036		530,308	313,728
Other Passenger Trains Cars, Spl.	1,330			1,330
Sleepers, Parlor and Observation, Foreign	212,539	212,539		
Sleepers, Parlor and Observation, Special	80	80		
Diners, Foreign	76,042	76,042		
Sleepers, DSS&A	516,333	516,333		
Diners, DSS&A	115,678	115,678		
Observation-Diners, DSS&A	179,614	179,614		
Passengers Cars—CM&StP and C&NW	66,955			66,955
Other Passenger Train Cars—CM&StP and C&NW	33,492		1,144	32,348
Sleepers, CM&StP and C&NW	4,380	4,380		
Totals	3,747,155	1,104,666	554,676	2,087,813
Percents	100.00	29.48	14.80	55.72

Ratio No. 3a—Michigan Passenger Train Car Miles Excluding the C. M. & St. P and C. & N. W. into Marquette.

	Car Miles		Michigan	
	Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
Total as above	3,747,155	1,104,666	554,676	2,087,813
Deduct CM&StP and C&NW	104,827	4,380	1,144	99,303
Totals	3,642,328	1,100,286	553,532	1,988,510
Percent	100.00	30.21	15.20	54.59

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

Ratio No. 3b—Michigan Passenger Train Car Miles, D. S. S. & A. Trains on D. S. S. & A. Tracks, Exclusive of Sleepers and Diners.

	Total	Passengers & Baggage	Mail & Express
Passenger Train Cars	1,691,425	23,224	1,668,201
Passenger Train Cars, Special	5,251		5,251
Other Passenger Train Cars	844,036	530,308	313,728
Other Passenger Train Cars, Special	1,330		1,330
Total	2,542,042	553,532	1,988,510
Percent	100.00	21.78	78.22

Ratio No. 3c—System Passenger Car Miles (other than Sleepers and Diners) on the D. S. S. & A. and Mineral Range.

	Car Miles	Percent
Michigan DSS&A Cars on DSS&A	2,177,800	77.73
Michigan DSS&A Cars on Mineral Range	115,645	4.13
Outside Michigan DSS&A Cars on DSS&A	508,231	18.14
Total	2,801,676	100.00

Ratio No. 3d—Michigan Passenger Train Car Miles (D. S. S. & A.) Divided to Mail and Express and Passengers and Baggage.

	Car Miles	Percent
Michigan Passenger Train Cars, Passengers and Baggage	1,624,268	74.58
Michigan Passenger Train Cars, Mail and Express	553,532	25.42
Total	2,177,800	100.00

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Ratio No. 4—Time of Trains and Switching on Common Tracks in Michigan.

	Mileage	Minutes per Mile.	Total Time in Minutes.	Passenger Time.	Freight Time.
Passenger Trains	779,749	2.4862	1,938,211	1,938,211	
Freight Trains	752,324	6.0559	4,555,999		4,555,999
Mixed Trains	16,920	2.9227	49,452	7,868	41,584
Special Passenger	622	2.4862	1,547	1,547	
Special Mixed	1,260	6.0559	7,630	1,214	6,416
	1,550,875		6,552,839	1,948,840	4,603,999
Deduct for Train left on Exclusive tracks.	4,263	10.	42,630		42,630
	1,546,612		6,510,209	1,948,840	4,561,369
Add Yard Switching on Common Tracks.					
Passenger	3,413	10.	34,130	34,130	
Freight	140,730	10.	1,407,300		1,407,300
Total	1,690,755		7,951,639	1,982,970	5,968,669
Percent			100.00	24.94	75.06

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

Ratio No. 4a—System Time of Use of Tracks, Passenger and Freight Trains and Yard Switching.

	System Miles	Minutes Per Mile	Total Time in Minutes	Passenger Time	Freight Time
Passenger Trains	939,316	2.4862	2,334,927	2,334,927	
Freight Trains	911,473	6.0559	5,519,789		5,519,789
Mixed Trains	16,920	2.9227	49,452	7,868	41,584
Special Passenger	761	2.4862	1,892	1,892	
Special Mixed	1,582	6.0559	10,186	1,908	8,278
Pass. Yard Switching	7,304	10.	73,040	73,040	
Frgt. Yard Switch'g	289,620	10.	2,896,200		2,896,200
Totals			10,885,486	2,419,635	8,465,851
Percent			100.00	22.23	77.77

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

Ratio No. 10, Michigan Passenger Miles.

		Miles	Percent
Intrastate Passengers, one mile		21,016,459	70.81
Interstate Passengers, one mile		8,665,624	29.19
	Total	29,682,083	100.00

Ratio No. 11 a—System Revenue Freight Train Miles.

		Miles	Percent
Michigan Freight Train Miles		767,612	82.81
Outside Michigan Freight Train Miles		159,356	17.19
	Total	926,968	100.00

Ratio No. 11 b—System Revenue Passenger Train Miles.

		Miles	Percent
Michigan Passenger Train Miles		751,559	82.46
Outside Michigan Passenger Train Miles		159,821	17.54
	Total	911,380	100.00

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Passenger and Freight Switching in Various Yards in Michigan and Ratios No. 13, No. 13a, No. 13b and No. 13c.

	Switching Miles			Subdivision of Passenger			
	Total	Freight	Passenger	Passenger Percent	Mail & Express	Sleepers & Diners	Passengers & Baggage
Marquette	148,985	143,721	5,264	3.53	1.92	57.37	40.71
St. Ignace	49,230	47,190	2,040	4.14	12.94	33.09	53.97
Houghton	23,715	23,715					
Ishpeming-Negaunee	65,652	65,652					
Totals	287,582	280,278	7,304	2.54	5.00	50.59	44.41
Train Switching	122,977	120,775	2,202		16.67		83.33
Total all Switching	410,559	401,053	9,506	2.32	7.70	38.87	53.43

		%
Ratio No. 13, Total Switching:	Passenger	2.32
	Freight	97.68
Ratio No. 13a, Yard Switching:	Passenger	2.54
	Freight	97.46
Ratio No. 13b, Yard Switching assigned to Services:		
	Mail and Express	5.00
	Sleepers and Diners	50.59
	Passengers and Baggage	44.41
Ratio No. 13c, All Switching assigned to Services:		
	Mail and Express	7.70
	Sleepers and Diners	38.87
	Passengers and Baggage	53.43

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Ratio No. 17—Allocated Station Pay Roll—Michigan.

		Amount	Percent
Allocated Passenger Employees		$11,955.27	16.58
Allocated Freight Employees		60,160.21	83.42
	Total	72,115.48	100.00

Ratio No. 17a—Passenger Trainmen's Pay Roll.

		Amount	Percent
Conductors, January and May		$5,657.90	52.98
Brakemen, January and May		3,118.78	29.21
Baggagemen, January and May		1,901.93	17.81
	Total	10,678.61	100.00

Locomotive Mileage.

	System			Michigan		
	Total	Passenger	Freight	Total	Passenger	Freight
Passenger	935,536	935,536		772,466	772,466	
Freight	972,227		972,227	809,240		809,240
Mixed	16,920	2,692	14,228	16,920	2,692	14,228
Spl. Passenger	876	876		686	686	
Spl. Mixed	1,717	337	1,380	1,394	222	1,172
	1,927,276	939,441	987,835	1,600,706	776,066	824,640
Switching:						
Train Passenger	2,202	2,202		2,202	2,202	
Train Freight	144,842		144,842	120,775		120,775
Yard Passenger	7,304	7,304		7,304	7,304	
Yard Freight	289,620		289,620	280,278		280,278
	443,968	9,506	434,462	410,559	9,506	401,053
M.R. Passenger	43,182	43,182		43,182	43,182	
C&NW Pass.	10,980	10,980		10,980	10,980	
CM&StP Pass.	20,724	20,724		20,724	20,724	
	31,704	31,704		31,704	31,704	

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

Train Mileage and Train Switching.
Used in Various Accounts.

	System			Michigan		
	Total	Passenger	Freight	Total	Passenger	Freight
Trains:						
Passenger	907,612	907,612		748,045	748,045	
Freight	911,473		911,473	752,324		752,324
Mixed	16,920	2,692	14,228	16,920	2,692	14,228
Special:						
Passenger	761	761		622	622	
Mixed	1,582	315	1,267	1,260	200	1,060
	1,838,348	911,380	926,968	1,519,171	751,559	767,612
Train Switching:						
Passenger	2,202	2,202		2,202	2,202	
Freight	144,842		144,842	120,775		120,775
	147,044	2,202	144,842	122,977	2,202	120,775
M. R. Passenger	43,182	43,182		43,182	43,182	
CM&STP Pass.	20,724	20,724		20,724	20,724	
C&NW Pass.	10,980	10,980		10,980	10,980	
	31,704	31,704		31,704	31,704	
Light Locomotive Miles	56,606	16,993	39,613	50,638	13,652	36,986
Light Locomotive Miles, Spl.	212	43	169	160	25	135
Total	56,838	17,036	39,782	50,798	13,677	37,121

Apportionments of Primary Expense Accounts.

Details.

The basic figures, as used in the following computations and divisions of expenses, are used as taken from the books and records of the company, without adjustment for the purpose of reducing them to those necessary for a normal year of operation, and are subject to adjustments to be made to eliminate expenditures to make good deferred maintenance, and those for additions and betterments, etc.

It is the claim of defendants that the expenses in the Maintenance of Way group of this year were excessive in at least the amount of $17,000.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

Accounts against which there are no charges for the year.

I. Maintenance of Way and Structures:

No. 203 Roadway—Depreciation.
204 Underground Power Tubes.
205 Underground Power Tubes—Depreciation.
206 Tunnels and Subways.
207 Tunnels and Subways—Depreciation.
209 Bridges, Trestles and Culverts—Depreciation.
210 Elevated Structures.
211 Elevated Structures—Depreciation.
213 Ties—Depreciation.
215 Rails—Depreciation.
217 Other Track Material—Depreciation.
219 Ballast—Depreciation.
222 Right-of-Way Fences—Depreciation.
224 Snow and Sand Fences and Snowsheds—Depreciation.
226 Crossings and Signs—Depreciation.
228 Station and Office Buildings—Depreciation.
230 Roadway Buildings—Depreciation.
232 Water Stations—Depreciation.
234 Fuel Stations—Depreciation.
236 Shops and Enginehouses—Depreciation.
237 Grain Elevators.
238 Grain Elevators—Depreciation.
239 Storage Warehouses.
240 Storage Warehouses—Depreciation.
242 Wharves and Docks—Depreciation.
245 Gas Producing Plants.
246 Gas Producing Plants—Depreciation.
248 Telegraph and Telephone Lines—Depreciation.
250 Signals and Interlockers—Depreciation.
251 Power Plant Dams, Canals and Pipe Lines.
252 Power Plant Dams, Canals and Pipe Lines—Depreciation.
253 Power Plant Buildings.
254 Power Plant Buildings—Depreciation.
255 Power Sub-station Buildings.
256 Power Sub-station Buildings—Depreciation.
257 Power Transmission Systems.
258 Power Transmission Systems—Depreciation.
259 Power Distribution Systems.
260 Power Distribution Systems—Depreciation.

Accounts against which there are no charges for the year (Continued)

261 Power Line Poles and Fixtures.
262 Power Line Poles and Fixtures—Depreciation.
263 Underground Conduits.
264 Underground Conduits—Depreciation.
266 Miscellaneous Structures—Depreciation.
267 Paving.
268 Paving—Depreciation.
270 Roadway Machines—Depreciation.
273 Assessments for Public Improvements.

II. Maintenance of Equipment:

No. 303 Shop Machinery—Depreciation.
304 Power Plant Machinery.
305 Power Plant Machinery—Depreciation.
306 Power Sub-station Apparatus.
307 Power Sub-station Apparatus—Depreciation.
311 Other Locomotives—Repairs.
312 Other Locomotives—Depreciation.
313 Other Locomotives—Retirements.
319 Passenger train cars—Retirements.
320 Motor Equipment of Cars—Repairs.
321 Motor Equipment of Cars—Depreciation.
322 Motor Equipment of Cars—Retirements.
323 Floating Equipment—Repairs.
324 Floating Equipment—Depreciation.
325 Floating Equipment—Retirements.
329 Miscellaneous Equipment—Repairs.
330 Miscellaneous Equipment—Depreciation.
331 Miscellaneous Equipment—Retirements.
335 Other Expenses.
337 Maintaining Joint Equipment at Terminals—Cr.

Accounts against which there are no charges for the year (Continued)

III. Traffic Expenses:

No. 359 Other Expenses.

IV. Transportation—Rail Line:

No. 381 Yard Motormen.
383 Yard Switching Power Produced.
384 Yard Switching Power Purchased.
393 Train Motormen.
395 Train Power Produced.
396 Train Power Purchased.
406 Drawbridge Operation.
408 Operating Floating Equipment.
409 Express Service.

V. Transportation—Water Line:

No. 431 Operation of Vessels.
432 Operation of Terminals.
433 Incidental.

VI. Miscellaneous Operations:

No. 442 Hotels and Restaurants.
443 Grain Elevators.
444 Stockyards.
445 Producing Power Sold.
446 Other Miscellaneous Operations.

VII. General:

No. 456 Relief Department Expenses.
462 General Joint Facilities—Cr.

I. Maintenance of Way and Structures.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

I. Maintenance of Way and Structures.
No. 201. Superintendence.

			%	$
1.	System Total, per Annual Report		100.00	24,651
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following)	$523,439		
3.	Outside Michigan	88,409	16.89	4,164
4.	Michigan	435,030	83.11	20,487
5.	Michigan Total, Line 4		100.00	20,487
6.	Divided relatively with the total of charges to Michigan Freight and Passenger on Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following)	$435,030		
7.	Freight	338,879	77.90	15,959
8.	Passenger	96,151	22.10	4,528
9.	Michigan Passenger, Line 8		100.00	4,528
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following	$ 96,151		
11.	Sleepers and Diners	34,162	35.53	1,609
12.	Mail and Express	13,953	14.51	657
13.	Passengers and Baggage	48,036	49.96	2,262
14.	Michigan Passengers and Baggage, Line 13		100.00	2,262
15.	Divided on Michigan Passenger Miles, Ratio No. 10			
16.	Interstate		29.19	660
17.	Intrastate		70.81	1,602

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

Details for dividing Accounts 201, 269, 271, 274, 275, 276, 277, 278 and 279.

Acct. No.	System Total	Outside Michigan.	MICHIGAN					
			Total	Freight	Passenger. Total	Sleepers & Diners.	Mail & Express.	Passengers & Baggage.
	$	$	$	$	$	$	$	$
202	67,951	9,959	57,992	45,926	12,066	3,557	1,786	6,723
208	60,062	14,175	45,887	34,927	10,960	3,231	1,622	6,107
212	70,021	13,642	56,379	43,252	13,127	5,175	1,898	6,054
214	5,433	772	4,661	3,576	1,085	428	157	500
216	23,218	3,121	20,097	15,418	4,679	1,844	677	2,158
218	3,035	59	2,976	2,283	693	273	100	320
220	180,349	34,736	145,613	111,709	33,904	13,365	4,903	15,636
221	6,928	847	6,081	4,816	1,265	373	187	705
223	432	236	196	156	40	12	6	22
225	1,667	763	904	716	188	55	28	105
227	9,724	705	9,019	7,546	1,473		147	1,326
229	2,571	56	2,515	1,929	586	231	85	270
231	8,284	1,285	6,999	4,894	2,105	848	306	951
233	2,436	378	2,058	1,439	619	249	90	280
235	20,314	2,134	18,180	12,665	5,515	2,202	803	2,510
241	1,316		1,316	1,185	131	43,190	17	71
243	12,812		12,812	12,812				
247	3,487	514	2,973	2,328	645	190	96	359
249	279	101	178	169	9	3	1	5
265	140	21	119	86	33	11	4	18
272	42,980	4,905	38,075	31,047	7,028	2,072	1,040	3,916
Total	523,439	88,409	435,030	338,879	96,151	34,162	13,953	48,036

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 202—Roadway Maintenance.

		%	$
1.	System Total, per Annual Report, 67,951; allocated to Michigan		57,992
2.	Subdivided into sub-primary accounts		
3.	Care of Roadbed		9,061
4.	General Cleaning		20,355
5.	Watching Roadway		21,593
6.	Track Changes		366
7.	Train Service		5,159
8.	Bank Protection		1,458
9.	Michigan Total, Line 1	100.00	57,992
10.	Divided on Michigan Equated Track Miles, Ratio No 2		
11.	Freight	17.18	9,963
12.	Common Freight and Passenger	82.62	47,913
13.	Passenger	.20	116
14.	Michigan Common, Line 12	100.00	47,913
15.	Divided on Time, Ratio No. 4		
16.	Freight	75.06	35,963
17.	Passenger	24.94	11,950
18.	Michigan Freight Recap:		
19.	Exclusive, Line 11		9,963
20.	Common, Line 16		35,963
21.	Total Michigan Freight		45,926
22.	Michigan Passenger Recap:		
23.	Exclusive, Line 13		116
24.	Common, Line 17		11,950
25.	Total Michigan Passenger		12,066
26.	Michigan Passenger, Line 25	100.00	12,066
27.	Divided on Michigan Total Passenger train car miles, Ratio No. 3.		
28.	Sleepers and Diners	29.48	3,557
29.	Mail and Express	14.80	1,786
30.	Passengers and Baggage	55.72	6,723
31.	Michigan Passengers and Baggage, Line 30	100.00	6,723
32.	Divided on Michigan Passenger miles, Ratio No. 10		
33.	Interstate	29.19	1,962
34.	Intrastate	70.81	4,761

NOTE:—This account corresponds with Group B of Account No. 6 under the old classification.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 208—Bridges, Trestles and Culverts.

		%	$
1.	System Total, per Annual Report, $60,062; allocated to Michigan		45,887
2.	Allocated to Services. (See following page)		
3.	Freight		1,940
4.	Common Freight and Passenger		43,947
5.	Michigan Common, Line 4	100.00	43,947
6.	Divided on Michigan Time, Ratio No. 4		
7.	Freight	75.06	32,987
8.	Passenger	24.94	10.960
9.	Michigan Freight Recap:		
10.	Exclusive, Line 3		1,940
11.	Common, Line 7		32,987
12.	Total Michigan Freight		34,927
13.	Michigan Passenger, Line 8	100.00	10.960
14.	Divided on Michigan Total Passenger Train Car miles, Ratio No. 3		
15.	Sleepers and Diners	29.48	3,231
16.	Mail and Express	14.80	1,622
17.	Passengers and Baggage	55.72	6,107
18.	Michigan Passengers and Baggage, Line 17	100.00	6,107
19.	Divided on Michigan Passenger miles, Ratio No. 10		
20.	Interstate	29.19	1,783
21.	Intrastate	70.81	4,324

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 208—Bridges, Trestles and Culverts.
Bridges on Exclusive Freight Tracks.
Michigan.

Description	Our Distribution	D.S.S.&A. Distribution
	$	$
See Why Branch	133.47	5.69
Bode Spur	9.52	
Queen Mine Branch	9.87	
Robinson Spur	2.40	
Dollarville Mill Track	93.04	
Baraga Mill Track	15.08	
Beaufort Branch	299.40	299.40
Dead River Trestle	11.38	11.38
Ohio Mine	3.40	3.40
Seney LS&M RR Track	4.00	4.00
Strongs Branch	13.05	13.05
Bridge Marquette, near Gaines house	8.91	8.91
Prison Branch Culverts	735.41	735.41
Section 29	6.25	6.25
Negaunee-Palmer Branch	284.59	284.59
Stone Quarry Track	10.30	10.30
	1,640.07	1,382.38
Add on account of Bridges, Trestles and Culverts on common and freight for freight proportion. (See Hillman)	300.23	
Total	1,940.30	1,382.38

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 212, Ties.

		%	$
1.	System Total, per Annual Report, $70,021; allocated to Michigan by Delf	100.00	56,379
2.	Divided on Michigan Equated Track Miles, Ratio No. 2		
3.	Freight	17.18	9,686
4.	Common Freight and Passenger	82.62	46,580
5.	Passenger	.20	113
6.	Michigan Common, Line 4	100.00	46,580
7.	Divided on Michigan Total Gross Ton Miles, Ratio No. 1.		
8.	Freight	72.06	33,566
9.	Passenger	27.94	13,014
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		9,686
12.	Common, Line 8		33,566
13.	Total Michigan Freight		43,252
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		113
16.	Common, Line 9		13,014
17.	Total Michigan Passenger		13,127
18.	Michigan Passenger, Line 17	100.00	13,127
19.	Divided on Michigan Passenger Gross Ton-miles, Ratio No. 1 a.		
20.	Sleepers and Diners	39.42	5,175
21.	Mail and Express	14.46	1,898
22.	Passengers and Baggage	46.12	6,054
23.	Michigan Passengers and Baggage, Line 22	100.00	6,054
24.	Divided on Michigan Passenger miles, Ratio No. 10.		
25.	Interstate	29.19	1,767
26.	Intrastate	70.81	4,287

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 214. Rails.

		%	$
1.	System Total, per Annual Report, $5,433; allocated to Michigan by Delf.	100.00	4,661
2.	Divided on Michigan Equated Track Miles, Ratio No. 2		
3.	Freight	17.18	801
4.	Common Freight and Passenger	82.62	3,851
5.	Passenger	.20	9
6.	Michigan Common, Line 4	100.00	3,851
7.	Divided on Michigan Total Gross Ton Miles, Ratio No. 1		
8.	Freight	72.06	2,775
9.	Passenger	27.94	1,076
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		801
12.	Common, Line 8		2,775
13.	Total Michigan Freight		3,576
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		9
16.	Common, Line 9		1,076
17.	Total Michigan Passenger		1,085
18.	Michigan Passenger, Line 17	100.00	1,085
19.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1a.		
20.	Sleepers and Diners	39.42	428
21.	Mail and Express	14.46	157
22.	Passengers and Baggage	46.12	500
23.	Michigan Passengers and Baggage, Line 22	100.00	500
24.	Divided on Michigan Passenger miles, Ratio No. 10.		
25.	Interstate	29.19	146
26.	Intrastate	70.81	354

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 216, Other Track Material.

		%	$
1.	System Total, per Annual Report, $23,218; allocated to Michigan by Delf.	100.00	20,097
2.	Divided on Michigan Equated Track Miles, Ratio No. 2.		
3.	Freight	17.18	3,453
4.	Common Freight and Passenger	82.62	16,604
5.	Passenger	.20	40
6.	Michigan Common, Line 4	100.00	16,604
7.	Divided on Michigan Total Gross Ton Miles, Ratio No. 1		
8.	Freight	72.06	11,965
9.	Passenger	27.94	4,639
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		3,453
12.	Common, Line 8		11,965
13.	Total Michigan Freight		15,418
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		40
16.	Common, Line 9		4,639
17.	Total Michigan Passenger		4,679
18.	Michigan Passenger, Line 17	100.00	4,679
19.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1a.		
20.	Sleepers and Diners	39.42	1,844
21.	Mail and Express	14.46	677
22.	Passengers and Baggage	46.12	2,158
23.	Michigan Passengers and Baggage, Line 22	100.00	2,158
24.	Divided on Michigan Passenger Miles, Ratio No. 10.		
25.	Interstate	29.19	630
26.	Intrastate	70.81	1,528

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 218, Ballast.

		%	$
1.	System Total, per Annual Report, $3,035; allocated to Michigan by Delf.	100.00	2,976
2.	Divided on Michigan Equated Track Miles, Ratio No. 2		
3.	Freight	17.18	511
4.	Common Freight and Passenger	82.62	2,459
5.	Passenger	.20	6
6.	Michigan Common, Line 4	100.00	2,459
7.	Divided on Michigan Total Gross Ton Miles, Ratio No. 1		
8.	Freight	72.06	1,772
9.	Passenger	27.94	687
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		511
12.	Common, Line 8		1,772
13.	Total Michigan Freight		2,283
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		6
16.	Common, Line 9		687
17.	Total Michigan Passenger		693
18.	Michigan Passenger, Line 17	100.00	693
19.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1a		
20.	Sleepers and Diners	39.42	273
21.	Mail and Express	14.46	100
22.	Passengers and Baggage	46.12	320
23.	Michigan Passengers and Baggage, Line 22	100.00	320
24.	Divided on Michigan Passenger Miles, Ratio No. 10		
25.	Interstate	29.19	93
26.	Intrastate	70.81	227

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 220. Track Laying and Surfacing.

		%	$
1.	System Total, per Annual Report, $180,349; allocated to Michigan.		145,613
2.	Subdivided into sub-primary accounts		
3.	Applying Ballast		5,315
4.	" Ties		35,571
5.	" Rails		5,100
6.	" Other Track Material		1,407
7.	Track Maintenance		94,760
8.	Track Changes		806
9.	Train Service		2,654
10.	Michigan Total, Line 1	100.00	145,613
11.	Divided on Michigan Equated Track Miles, Ratio No. 2		
12.	Freight	17.18	25,016
13.	Common Freight and Passenger	82.62	120,306
14.	Passenger	.20	291
15.	Michigan Common, Line 13	100.00	120,306
16.	Divided on Michigan Total Gross Ton-miles, Ratio No. 1		
17.	Freight	72.06	86,693
18.	Passenger	27.94	33,613
19.	Michigan Freight Recap:		
20.	Exclusive, Line 12		25,016
21.	Common, Line 17		86,693
22.	Total Michigan Freight		111,709

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 220—Track Laying and Surfacing (Continued).

		%	$
23.	Michigan Passenger Recap:		
24.	Exclusive, Line 14		291
25.	Common, Line 18		33,613
26.	Total Michigan Passenger		33,904
27.	Michigan Passenger, Line 26	100.00	33,904
28.	Divided on Michigan Passenger Gross Ton miles, Ratio No. 1a.		
29.	Sleepers and Diners	39.42	13,365
30.	Mail and Express	14.46	4,903
31	Passengers and Baggage	46.12	15,636
32.	Michigan Passengers and Baggage, Line 31	100.00	15,636
33.	Divided on Michigan Passenger miles, Ratio No. 10		
34.	Interstate	29.19	4,564
35.	Intrastate	70.81	11,072

NOTE:—This account corresponds with Group A of Account No. 6 under the old classification.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 221, Right-of-Way Fences.

		%	$
1.	System Total, per Annual Report, $6,928; allocated to Michigan by Delf.	100.00	6,081
2.	Divided on Michigan Equated Track Miles, Ratio No. 2.		
3.	Freight	17.18	1,045
4.	Common Freight and Passenger	82.62	5,024
5.	Passenger	.20	12
6.	Michigan Common, Line 4	100.00	5,024
7.	Divided on Michigan Time, Ratio No. 4.		
8.	Freight	75.06	3,771
9.	Passenger	24.94	1,253
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		1,045
12.	Common, Line 8		3,771
13.	Total Michigan Freight		4,816
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		12
16.	Common, Line 9		1,253
17.	Total Michigan Passenger		1,265
18.	Michigan Passenger, Line 17	100.00	1,265
19.	Divided on Michigan Total Passenger Train Car Miles, Ratio No. 3.		
20.	Sleepers and Diners	29.48	373
21.	Mail and Express	14.80	187
22.	Passengers and Baggage	55.72	705
23.	Michigan Passengers and Baggage, Line 22.	100.00	705
24.	Divided on Michigan Passenger Miles, Ratio No. 10		
25.	Interstate	29.19	206
26.	Intrastate	70.81	499

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 223, Snow and Sand Fences and Snowsheds.

		%	$
1.	System Total, per Annual Report, $432; allocated to Michigan by Delf.	100.00	196
2.	Divided on Michigan Equated Track Miles, Ratio No. 2.		
3.	Freight	17.18	34
4.	Common Freight and Passenger	82.62	162
5.	Passenger	.20	0
6.	Michigan Common, Line 4	100.00	162
7.	Divided on Michigan Time, Ratio No. 4.		
8.	Freight	75.06	122
9.	Passenger	24.94	40
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		34
12.	Common, Line 8		122
13.	Total Michigan Freight		156
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		0
16.	Common, Line 9		40
17.	Total Michigan Passenger		40
18.	Michigan Passenger, Line 17	100.00	40
19.	Divided on Michigan Total Passenger Train Car Miles, Ratio No. 3.		
20.	Sleepers and Diners	29.48	12
21.	Mail and Express	14.80	6
22.	Passengers and Baggage	55.72	22
23.	Michigan Passengers and Baggage, Line 22	100.00	22
24.	Divided on Michigan Passenger Miles, Ratio No. 10.		
25.	Interstate	29.19	6
26.	Intrastate	70.81	16

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 225, Crossings and Signs.

		%	$
1.	System Total, per Annual Report, $1,667; allocated to Michigan by Delf.	100.00	904
2.	Divided on Michigan Equated Track Miles, Ratio No. 2.		
3.	Freight	17.18	155
4.	Common Freight and Passenger	82.62	747
5.	Passenger	.20	2
6.	Michigan Common, Line 4	100.00	747
7.	Divided on Michigan Time, Ratio No. 4		
8.	Freight	75.06	561
9.	Passenger	24.94	186
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		155
12.	Common, Line 8		561
13.	Total Michigan Freight		716
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		2
16.	Common, Line 9		186
17.	Total Michigan Passenger		188
18.	Michigan Passenger, Line 17	100.00	188
19.	Divided on Michigan Total Passenger Train Car Miles, Ratio No. 3.		
20.	Sleepers and Diners	29.48	55
21.	Mail and Express	14.80	28
22.	Passengers and Baggage	55.72	105
23.	Michigan Passengers and Baggage, Line 22	100.00	105
24.	Divided on Michigan Passenger Miles, Ratio No. 10		
25.	Interstate	29.19	31
26.	Intrastate	70.81	74

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 227. Station and Office Buildings.

			%	$
1.	System Total, per Annual Report			9,724
2.	Allocated to Stations and General Offices.			
3.	Stations			9,649
4.	General Offices (Common Freight and Passenger)			75
5.	System Stations, Line 3 $9,649; allocated to Michigan			8,955
6.	Allocated to Services (Hillman data)			
7.	Track Scales (all Freight)			1,143
8.	Other Freight			2,833
9	Common Freight and Passenger			4,225
10.	Passenger			754
11.	Michigan Common Stations, Line 9		100.00	4,225
12.	Divided on Station Pay roll, Ratio No. 17			
13.	Freight		83.42	3,524
14.	Passenger		16.58	701
15.	System Common General Offices, Line 4		100.00	75
16.	Divided relatively with the total of charges to Michigan (excluding Mineral Range) and outside of Michigan in General Account No. IV, "Transportation."	$1,211,126		
17.	Outside Michigan	179,920	14.86	11
18.	Michigan	1,031,206	85.14	64
19.	Michigan Common General Offices, Line 18		100.00	64
20.	Divided relatively with the total of charges to Michigan Freight and Pas-			
21.	Freight	741,819	71.94	46
22.	Passenger	289,387	28.06	18
	senger in General Account No. IV., "Transportation."	$1,031,206		

No. 227—Station and Office Buildings (Continued).

			%	$
23.	Michigan Freight Recap:			
24.	Track Scales, Line 7			1,143
25.	Other Exclusive, Line 8			2,833
26.	Common Stations, Line 13			3,524
27.	Common General Offices, Line 21			46
28.	Total Michigan Freight			7,546
29.	Michigan Passenger Recap:			
30.	Exclusive, Line 10			754
31.	Common Stations, Line 14			701
32.	Common General Offices, Line 22			18
33.	Total Michigan Passenger			1,473
34.	Michigan Passenger, Line 33		100.00	1,473
35.	Divided relatively with the charges to Michigan Passenger Services in Account No. 373.	$ 23,471		
36.	Mail and Express	2,347	10.00	147
37.	Passengers and Baggage	21,124	90.00	1,326
38.	Michigan Passengers and Baggage, Line 37		100.00	1,326
39.	Divided on Michigan Passenger Miles, Ratio No. 10.			
40.	Interstate		29.19	387
41.	Intrastate		70.81	939

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 229—Roadway Buildings.

		%	$
1.	System Total, per Annual Report, $2,571; allocated to Michigan by Delf	100.00	2,515
2.	Divided on Michigan Equated Track miles, Ratio No. 2		
3.	Freight	17.18	432
4.	Common Freight and Passenger	82.62	2,078
5.	Passenger	.20	5
6.	Michigan Common, Line 4	100.00	2,078
7.	Divided on Michigan Total Gross Ton-miles, Ratio No. 1		
8.	Freight	72.06	1,497
9.	Passenger	27.94	581
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		432
12.	Common, Line 8		1,497
13.	Total Michigan Freight		1,929
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		5
16.	Common, Line 9		581
17.	Total Michigan Passenger		586
18.	Michigan Passenger, Line 17	100.00	586
19.	Divided on Michigan Passenger Gross Ton-miles, Ratio No. 1a.		
20.	Sleepers and Diners	39.42	231
21.	Mail and Express	14.46	85
22.	Passengers and Baggage	46.12	270
23.	Michigan Passengers and Baggage, Line 22	100.00	270
24.	Divided on Michigan Passenger miles, Ratio No. 10		
25.	Interstate	29.19	79
26.	Intrastate	70.81	191

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 231—Water Stations.

No. 233—Fuel Station.

				No. 231	No. 233
			%	$	$
1.	System Total, per Annual Report		100.00	8,284	2,436
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 382 and 394	$330,846			
3.	Outside Michigan	51,303	15.51	1,285	378
4.	Michigan	279,543	84.49	6,999	2,058
5.	Michigan Total, Line 4		100.00	6,999	2,058
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 382 and 394	$274,995			
7.	Freight	192,280	69.92	4,894	1,439
8.	Passenger	82,715	30.08	2,105	619
9.	Michigan D.S.S.&A. Passenger, Line 8		100.00	2,105	619
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 382 and 394	$ 82,715			
11.	Sleepers and Diners	33,323	40.29	848	249
12.	Mail and Express	12,033	14.55	306	90
13.	Passengers and Baggage	37,359	45.16	951	280
14.	Michigan Passengers and Baggage, Line 13		100.00	951	280
15.	Divided on Michigan Passenger Miles, Ratio		No. 10		
16.	Interstate		29.19	278	82
17.	Intrastate		70.81	673	198

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 235, Shops and Enginehouses.

1.	System Total, per Annual Report			$ 20,314
2.	Allocated to Shops and Enginehouses.			
3.	Marquette General Shops			1,119
4.	Enginehouses:			
5.	Superior		$ 167	
6.	Soo		15,045	
7.	Soo Junction		82	
8.	St. Ignace		202*	
9.	Marquette		2,106	
10.	South Ishpeming		1,946	
11.	Michigamme		166	
12.	L'Anse		110	
13.	Houghton		205	
14.	Thomaston		430*	
15.	Total Enginehouses			19,195
			%	
16.	System Total Shops, Line 3		100.00	1,119
17.	Divided relatively with the total of charges to Michigan and Outside of Michigan in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$294,924		
18.	Outside Michigan	44,353	15.04	168
19.	Michigan	250,571	84.96	951
20.	Michigan Total Shops, Line 19		100.00	951
21.	Divided relatively with the total of charges to Michigan Freight and Pasenger in Accounts 306, 314, 317 and 326 (see detail page following Account No. 301)	$247,526		
22.	Freight	180,742	73.02	694
23.	Passenger	66,784	26.98	257
24.	Michigan Passenger Shops, Line 23		100.00	257
25.	Divided relatively with the total of charges to Michigan Passenger Service in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$ 66,784		
26.	Sleepers and Diners	19,652	29.43	76
27.	Mail and Express	11,755	17.60	45
28.	Passengers and Baggage	35,377	52.97	136
29.	System Total Enginehouses, Line 15		100.00	19,195(a)
30.	Divided relatively with the total of charges to Michigan and Outside of Michigan in Accounts 388 and 400	$ 61,073		
31.	Outside Michigan	6,255	10.24	1,966
32.	Michigan	54,818	89.76	17,229

*Typewritten figures in red.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 235, Shops and Enginehouses (continued).

			%	$
33.	Michigan Total Enginehouses, Line 32		100.00	17,229
34.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 388 and 400	$54,818		
35.	Freight	38,087	69.48	11,971
36.	Passenger	16,731	30.52	5,258
37.	Michigan Passenger Enginehouses, Line 36		100.00	5,258
38.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 388 and 400	$16,731		
39.	Sleepers and Diners	6,766	40.44	2,126
40.	Mail and Express	2,413	14.42	758
41.	Passengers and Baggage	7,552	45.14	2,374
42.	Michigan Freight Recap:			
43.	Shops, Line 22			694
44.	Enginehouses, Line 35			11,971
45.	Total Michigan Freight			12,665
46.	Michigan Passenger Recap:			
47.	Shops, Line 23			257
48	Enginehouses, Line 36			5,258
49.	Total Michigan Passenger			5,515
50.	Michigan Sleepers and Diners Recap:			
51.	Shops, Line 26			76
52.	Enginehouses, Line 39			2,126
53.	Total Michigan Sleepers and Diners			2,202
54.	Michigan Mail and Express Recap:			
55.	Shops, Line 27			45
56.	Enginehouses, Line 40			758
57.	Total Michigan Mail and Express			803
58.	Michigan Passenger and Baggage Recap:			
59.	Shops, Line 28			136
60.	Enginehouses, Line 41			2,374
61.	Total Michigan Passengers and Baggage			2,510
62.	Michigan Passengers and Baggage, Line 61		100.00	2,510
63.	Divided on Michigan Passenger Miles, Ratio No. 10			
64.	Interstate		29.19	733
65.	Intrastate		70.81	1,777

NOTE.—(a) Of this Amount, $14,835 is for Renewals at Soo.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 241, Wharves and Docks.

		%	$
1.	System Total, per Annual Report, $1,316; allocated to Michigan by Delf.		1,316
2.	Allocated to Docks by Delf.		
3.	St. Ignace Merchandise Dock (all Freight)		626
4.	St. Ignace Slip—Dock		690
5.	St. Ignace Slip Dock, Line 4	100.00	690
6.	Divided on basis arrived at by Delf. (a)		
7.	Freight	80.98	559
8.	Passenger	19.02	131
9.	Michigan Freight Recap:		
10.	St. Ignace Merchandise Dock, Line 3		626
11.	St. Ignace Slip Dock, Line 7		559
12.	Total Michigan Freight		1,185
13.	Michigan Passenger, Line 8	100.00	131
14.	Divided on basis of Passenger cars over St. Ignace Slip Dock.		
15.	Sleepers and Diners	33.09	43
16.	Mail and Express	12.94	17
17.	Passengers and Baggage	53.97	71
18.	Michigan Passengers and Baggage, Line 17	100.00	71
19.	Divided on Michigan Passenger miles, Ratio No. 10.		
20.	Interstate	29.19	21
21.	Intrastate	70.81	50

NOTE:—

(a)

	Cars over Slip Dock		
Class	Total	Equated	Percent
Freight	58,872	58,872	80.98
Passenger	6,913 x 2	13,826	19.02
	65,785	72,698	100.00

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 243, Coal and Ore Wharves.

	$
1. System Total, per Annual Report, $12,812; allocated to Michigan by Delf.	12,812
All Freight.	

No. 244, Coal and Ore Wharves—Depreciation.

	$
1. System Total, per Annual Report, $19,146; allocated to Michigan by Delf.	19,146
All Freight.	

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 247. Telegraph and Telephone Lines.

			%	$
1.	System Total, per Annual Report		100.00	3,487
2.	Divided on System Time, Ratio No. 4a.			
3.	Freight		77.77	2,712
4.	Passenger		22.23	775
5.	System Freight, Line 3		100.00	2,712
6.	Divided relatively with the total mileage of Freight trains, (including proportion of Mixed and Special) plus Train and Yard Switching in and outside of Michigan	1,361,430		
7.	Outside Michigan	192,765	14.16	384
8.	Michigan	1,168,665	85.84	2,328
9.	System Passenger, Line 4		100.00	775
10.	Divided relatively with the total mileage of Passenger trains, (including C&NW and CM&St.P. operations into Marquette and proportion of Mixed and Special) plus train and Yard Switching, in and outside of Michigan.	952,590		
11.	Outside Michigan	159,821	16.78	130
12.	Michigan	792,769	83.22	645
13.	Michigan Passenger, Line 12		100.00	645
14.	Divided on Michigan Total Passenger train car miles, Ratio No. 3.			
15.	Sleepers and Diners		29.48	190
16.	Mail and Express		14.80	96
17.	Passengers and Baggage		55.72	359
18.	Michigan Passengers and Baggage, Line 17		100.00	359
19.	Divided on Michigan Passenger miles, Ratio No. 10.			
20.	Interstate		29.19	105
21.	Intrastate		70.81	254

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 249, Signals and Interlockers.

		%	$
1.	System Total, per Annual Report, $279; allocated to Michigan by Delf.	100.00	178
2.	Divided on same basis as Account No. 404.		
3.	Freight	94.76	169
4.	Passenger	5.24	9
5.	Michigan Passenger, Line 4.	100.00	9
6.	Divided on Michigan Total Passenger train Car Miles, Ratio No. 3.		
7.	Sleepers and Diners	29.48	3
8.	Mail and Express	14.80	1
9.	Passengers and Baggage	55.72	5
10.	Michigan Passengers and Baggage, Line 9	100.00	5
11.	Divided on Michigan Passenger Miles, Ratio No. 10.		
12.	Interstate	29.19	1
13.	Intrastate	70.81	4

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 265, Miscellaneous Structures.

			%	$
1.	System Total, per Annual Report		100.00	140
2.	Divided relatively with the Total of charges to Michigan (excluding Mineral Range) and outside of Michigan in General Account No. IV., "Transportation"	$1,211,126		
3.	Outside Michigan	179,920	14.86	21
4.	Michigan	1,031,206	85.14	119
5.	Michigan Total, Line 4		100.00	119
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Account No. IV., "Transportation"	$1,031,206		
7.	Freight	741,819	71.94	86
8.	Passenger	289,387	28.06	33
9.	Michigan Passenger, Line 8		100.00	33
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Account No. IV., "Transportation"	$ 289,387		
11.	Sleepers and Diners	97,940	33.84	11
12.	Mail and Express	35,871	12.40	4
13.	Passengers and Baggage	155,576	53.76	18
14.	Michigan Passengers and Baggage, Line 13		100.00	18
15.	Divided on Michigan Passenger Miles, Ratio No. 10.			
16.	Interstate		29.19	5
17.	Intrastate		70.81	13

Details of Account:

Stationary Building	$ 58.62
Storehouses	81.63
	$140.25

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 269—Roadway Machines.

			%	$
1.	System Total, per Annual Report		100.00	1,776
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$523,439		
3.	Outside Michigan	88,409	16.89	300
4.	Michigan	435,030	83.11	1,476
5.	Michigan Total, Line 4		100.00	1,476
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$435.030		
7.	Freight	338,879	77.90	1,150
8.	Passenger	96,151	22.10	326
9.	Michigan Passenger, Line 8		100.00	326
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$ 96.151		
11.	Sleepers and Diners	34,162	35.53	116
12.	Mail and Express	13,953	14.51	47
13.	Passengers and Baggage	48,036	49.96	163
14.	Michigan Passengers and Baggage, Line 13		100.00	163
15.	Divided on Michigan Passenger Miles, Ratio No. 10			
16.	Interstate		29.19	48
17.	Intrastate		70.81	115

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 271—Small Tools and Supplies.

			%	$
1.	System Total, per Annual Report		100.00	6,416
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$523,439		
3.	Outside Michigan	88,409	16.89	1,084
4.	Michigan	435,030	83.11	5,332
5.	Michigan Total, Line 4		100.00	5,332
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$435,030		
7.	Freight	338,879	77.90	4,154
8.	Passenger	96,151	22.10	1,178
9.	Michigan Passenger, Line 8		100.00	1,178
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$ 96,151		
11.	Sleepers and Diners	34,162	35.53	419
12.	Mail and Express	13,953	14.51	171
13.	Passengers and Baggage	48,036	49,96	588
14.	Michigan Passengers and Baggage, Line 13		100.00	588
15.	Divided on Michigan Passenger Miles, Ratio No. 10			
16.	Interstate		29.19	172
17.	Intrastate		70.81	416

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 272, Removing Snow, Ice and Sand.

		%	$
1.	System Total, per Annual Report, $42,980; allocated to Michigan by Delf.	100.00	38,075
2.	Divided to Services, by agreement.		
3.	Freight	29.00	11,042
4.	Common Freight and Passenger	70.00	26,652
5.	Passenger	1.00	381
6.	Michigan Common, Line 4	100.00	26,652
7.	Divided on Michigan Time, Ratio No. 4		
8.	Freight	75.06	20,005
9.	Passenger	24.94	6,647
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		11,042
12.	Common, Line 8		20,005
13.	Total Michigan Freight		31,047
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		381
16.	Common, Line 9		6,647
17.	Total Michigan Passenger		7,028
18.	Michigan Passenger, Line 17	100.00	7,028
19.	Divided on Michigan Total Passenger train Car Miles, Ratio No. 3.		
20.	Sleepers and Diners	29.48	2,072
21.	Mail and Express	14.80	1,040
22.	Passengers and Baggage	55.72	3,916
23.	Michigan Passengers and Baggage, Line 22	100.00	3,916
24.	Divided on Michigan Passenger Miles, Ratio No. 10		
25.	Interstate	29.19	1,143
26.	Intrastate	70.81	2,773

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 274. Injuries to Persons.

			%	$
1.	System Total, per Annual Report, $1,407. allocated to Michigan by Delf			823
2.	Allocated to Services by Delf.			
3.	Freight			97
4.	Common Freight and Passenger			726
5.	Michigan Common, Line 4		100.00	726
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$435,030		
7.	Freight	338,879	77.90	566
8.	Passenger	96,151	22.10	160
9.	Michigan Freight Recap:			
10.	Exclusive, Line 3			97
11.	Common, Line 7			566
12.	Total Michigan Freight			663
13.	Michigan Passenger, Line 8		100.00	160
14.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$96,151		
15.	Sleepers and Diners	34,162	35.53	57
16.	Mail and Express	13,953	14.51	23
17.	Passengers and Baggage	48,036	49.96	80
18.	Michigan Passengers and Baggage, Line 17		100.00	80
19.	Divided on Michigan Passenger Miles, Ratio No. 10.			
20.	Interstate		29.19	23
21.	Intrastate		70.81	57

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 275, Insurance.

			%	$
1.	System Total, per Annual Report, $4,299; allocated to Michigan.			3,789
2.	Allocated to Services			
3.	Freight			1,091
4.	Common Freight and Passenger			2,599
5.	Passenger			99
6.	Michigan Common, Line 4		100.00	2,599
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201.	$435,030		
8.	Freight	338,879	77.90	2,025
9.	Passenger	96,151	22.10	574
10.	Michigan Freight Recap:			
11.	Exclusive, Line 3			1,091
12.	Common, Line 8			2,025
13.	Total Michigan Freight			3,116
14.	Michigan Passenger Recap:			
15.	Exclusive, Line 5			99
16.	Common, Line 9			574
17.	Total Michigan Passenger			673
18.	Michigan Passenger, Line 17		100.00	673
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265, 272 (see detail page following Account No. 201)	$ 96,151		
20.	Sleepers and Diners	34,162	35.53	239
21.	Mail and Express	13,953	14.51	98
22.	Passengers and Baggage	48,036	49.96	336

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 275—Insurance (Continued).

		%	$
23.	Michigan Passengers and Baggage, Line 22	100.00	336
24.	Divided on Michigan Passenger Miles, Ratio No. 10		
25.	Interstate	29.19	98
26.	Intrastate	70.81	238

NOTE:—Delf divides the Michigan Common portion of this charge as follows:

Station and Roadway Buildings	$ 709.54
Enginehouses	415.80
Shops, etc., Marquette	238.00
Shops, etc., Other	23.71
Tanks and Pump Houses	332.40
Bridges, Trestles & Culverts	638.50
Coal Trestles, etc.	252.10
Total	$2,610.05

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 276. Stationery and Printing.

			%	$
1.	System Total, per Annual Report		100.00	1,109
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 202, 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$523,439		
3.	Outside Michigan	88,409	16.89	187
4.	Michigan	435,030	83.11	922
5.	Michigan Total, Line 4		100.00	922
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$435,030		
7.	Freight	338,879	77.90	718
8.	Passenger	96,151	22.10	204
9.	Michigan Passenger, Line 8		100.00	204
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201.)	$96,151		
11.	Sleepers and Diners	34,162	35.53	72
12.	Mail and Express	13,953	14.51	30
13.	Passengers and Baggage	48,036	49.96	102
14.	Michigan Passengers and Baggage, Line 13		100.00	102
15.	Divided on Michigan Passenger Miles, Ratio No. 10.			
16.	Interstate		29.19	30
17.	Intrastate		70.81	72

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 277, Other Expenses.

			%	$
1.	System Total, per Annual Report		100.00	245
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 202 to 243 inclusive, 247, 249, 265, and 272 (see detail page following Account No. 201)	$523,439		
3.	Outside Michigan	88,409	16.89	41
4.	Michigan	435,030	83.11	204
5.	Michigan Total, Line 4		100.00	204
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$435,030		
7.	Freight	338,879	77.90	159
8.	Passenger	96,151	22.10	45

No. 277—Other Expenses (Continued).

			%	$
9.	Michigan Passenger, Line 8		100.00	45
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$ 96,151		
11.	Sleepers and Diners	34,162	35.53	16
12.	Mail and Express	13,953	14.51	7
13.	Passengers and Baggage	48,036	49.96	22
14.	Michigan Passengers and Baggage, Line 13		100.00	22
15.	Divided on Michigan Passenger Miles, Ratio No. 10.			
16.	Interstate		27.19	6
17.	Intrastate		70.81	16

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 278—Maintaining Joint Tracks, Yards and Other Facilities—Dr.

			%	$
1.	System Total, per Annual Report, $13,434; allocated to Michigan by Delf			8,402
2.	Allocated to Services by Delf			
3.	Freight			7,512
4.	Common Freight and Passenger			32
5.	Passenger			858
6.	Michigan Common, Line 4		100.00	32
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$435.030		
8.	Freight	338,879	77.90	25
9.	Passenger	96,151	22.10	7
10.	Michigan Freight Recap:			
11.	Exclusive, Line 3			7,512
12.	Common, Line 8			25
13.	Total Michigan Freight			7,537
14.	Michigan Passenger Recap:			
15.	Exclusive, Line 5			858
16.	Common, Line 9			7
17.	Total Michigan Passenger			865
18.	Michigan Passenger, Line 17			865
19.	Allocated to Interstate Passengers and Baggage, Account of Soo Bridge			262
20.	Balance			603

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 278—Maintaining Joint Tracks, Yards and Other Facilities—Dr. (Continued)

			%	$
21.	Michigan Passenger, other than Soo Bridge, Line 20		100.00	603
22.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$ 96,151		
23.	Sleepers and Diners	34,162	35.53	214
24.	Mail and Express	13,953	14.51	88
25.	Passengers and Baggage	48,036	49.96	301
26.	Michigan Passenger and Baggage, other than Soo Bridge, Line 25		100.00	301
27.	Divided on Michigan Passenger Miles, Ratio No. 10			
28.	Interstate		29.19	88
29.	Intrastate		70.81	213
30.	Michigan Interstate Passengers and Baggage Recap:			
31.	Soo Bridge, Line 19			262
32.	Other, Line 28			88
33.	Total Michigan Interstate Passengers and Baggage			350

NOTE:—The Michigan Common portion of this charge is made up of the following:

Repairs, Trout Lake Station	$30.68
Repairs, Ispheming Gates	1.20
Total Michigan Common	$31.88

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 279. Maintaining Joint Tracks, Yards and Other Facilities—Cr.

			%	$
1.	System Total, per Annual Report, $13,818*; allocated to Michigan by Delf			13,818*
2.	Allocated to Services (see following page)			
3.	Freight			3,229*
4.	Common Freight and Passenger			6,606*
5.	Passenger			3,983*
6.	Michigan Common, Line 4		100.00	6,606*
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201).	$435,030		
8.	Freight	338,879	77.90	5,146*
9.	Passenger	96,151	22.10	1,460*
10.	Michigan Freight Recap:			
11.	Exclusive, Line 3			3,229*
12.	Common, Line 8			5,146*
13.	Total Michigan Freight			8,375*
14.	Michigan Passenger Recap:			
15.	Exclusive, Line 5			3,983*
16.	Common, Line 9			1,460*
17.	Total Michigan Passenger			5.443*

*Typewritten figures in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1915.

No. 279—Maintaining Joint Tracks, Yards and Other Facilities—Cr. (Continued)

			%	$
18.	Michigan Passenger, Line 17		100.00	5,443*
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$96,151		
20.	Sleepers and Diners	34,162	35.53	1,934*
21.	Mail and Express	13,953	14.51	790*
22.	Passengers and Baggage	46,036	49.96	2,719*
23.	Michigan Passengers and Baggage, Line 22		100.00	2,719*
24.	Divided on Michigan Passenger Miles, Ratio No. 10.			
25.	Interstate		29.19	794*
26.	Intrastate		70.81	1,925*

*Typewritten figures in red.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

Details of Account No. 279, Maintaining Joint Tracks, Yards and Other Facilities—Cr.

	Freight (2) $	Pass. (4) $	Common (3) $	Total (1) $
CM&STP Passenger to Calumet, 25%		1,372.50		1,372.50
C&NW Passenger to Calumet, and Marquette, 25%		2,532.25		2,532.25
Negaunee Depot		78.09		78.09
Various Mine Tracks	2,463.30			2,463.30
Mineral Range, Pilgrim to Houghton, 20%			864.44	864.44
C & N W, Michigamme to Beaufort Jct., 25%			717.00	717.00
Prison Tracks	182.69			182.69
Ishpeming Transfer	137.18			137.18
Sidnaw Joint Tracks	105.14			105.14
Soo Transfer	253.31			253.31
Soo Scales	32.19			32.19
Soo Stock Yard	7.07			7.07
Soo—Outside Union Depot			3,536.08	3,536.08
Insurance, Soo Line	8.00		132.37	140.37
M.M.S.E. Lake Street Track	40.00			40.00
Negaunee Tracks			360.00	360.00
Soo Culverts			280.28	280.28
Signs			3.48	3.48
Sec. Tool House			23.43	23.43
Flagman Shanty			.58	.58
Coal Hoist			5.45	5.45
Switch Shanty			70.88	70.88
Roundhouse and Turntables			78.82	78.82
Joint Stations Sidnaw, Champion, etc.			72.26	
Joint Water Tanks, Michigamme, etc.			461.36	
Totals	3,228.88	3,982.84	6,606.43	13,818.15

II. Maintenance of Equipment.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

II. Maintenance of Equipment.

No. 301, Superintendence.

			%	$
1.	System Total, per Annual Report		100.00	12,673
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 308, 314, 317 and 326 (see detail page following)	$294,924		
3.	Outside Michigan	44,353	15.04	1,906
4.	Michigan	250,571	84.96	10,767
5.	Michigan Total, Line 4		100.00	10,767
6.	Divided relatively with the total of charges to Michigan Freight and Passenger (MR and DSS&A) in Accounts 308, 314, 317 and 326 (see detail page following)	$250,571		
7.	Freight	180,742	72.13	7,766
8.	Passenger—M. R.	3,045	1.22	131
9.	Passenger—D. S. S. & A.	66,784	26.65	2,870
10.	Michigan Passenger, Line 9		100.00	2,870
11.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 308, 314, 317 and 326 (see detail page following)	$ 66,784		
12.	Sleepers and Diners	19,652	29.43	845
13.	Mail and Express	11,755	17.60	505
14.	Passengers and Baggage	35,377	52.97	1,520
15.	Michigan Passengers and Baggage, Line 14		100.00	1,520
16.	Divided on Michigan Passenger Miles, Ratio No. 10.			
17.	Interstate		29.19	444
18.	Intrastate		70.81	1,076

Details for Dividing Accounts Nos. 235, 301, 302, 332, 333, 334.

Acct. No.	System Total	Outside Michigan	MICHIGAN						
			Total	Freight	Mineral Range Passenger	D.S.S.&A. Passenger. Total	Sleepers and Diners	Mail and Express	Passengers and Baggage
	$	$	$	$	$	$	$	$	$
308	102,989	15,159	87,830	56,670	1,523	29,637	11,908	4,302	13,427
314	139,181	19,375	119,806	119,806					
317	46,155	8,666	37,489		1,522	35,967	7,323	7,281	21,363
326	6,599	1,153	5,446	4,266		1,180	421	172	587
Total	294,924	44,353	250,571	180,742	3,045	66,784	19,652	11,755	35,377

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 302. Shop Machinery.

			%	$
1.	System Total, per Annual Report		100.00	8,784
2.	Divided relatively with the total of charges to Michigan and Outside of Michigan in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$294,924		
3.	Outside Michigan	44,353	15.04	1,321
4.	Michigan	250,571	84.96	7,463
5.	Michigan Total, Line 4		100.00	7,463
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$247,526		
7.	Freight	180,742	73.02	5,449
8.	Passenger	66,784	26.98	2,014
9.	Michigan Passenger, Line 8		100.00	2,014
10.	Divided relatively with the total of charges to Michigan Passenger Services in Account 308, 314, 317 and 326 (see detail page following Account No. 301)	$ 66,784		
11.	Sleepers and Diners	19,652	29.43	593
12.	Mail and Express	11.755	17.60	354
13.	Passengers and Baggage	35,377	52.97	1,067
14.	Michigan Passengers and Baggage, Line 13		100.00	1,067
15.	Divided on Michigan Passenger Miles, Ratio No. 10			
16.	Interstate		29.19	311
17.	Intrastate		70.81	756

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 308, Steam Locomotives—Repairs.

			%	$
1.	System Total, per Annual Report			102,989
2.	Divided to Services (Hillman data)			
3.	Mineral Range Passenger (all Michigan)			1,523
4.	Regular Freight			51,103
5.	Mixed (all Michigan)			579
6.	Special			88
7.	Yard Switching			14,408
8.	Passenger Train Switching (all Michigan)			129
9.	Regular Passenger			35,159
10.	System Regular Freight, Line 4		100.00	51,103
11.	Divided relatively with the Total Mileage of Regular Freight train locomotives in and outside of Michigan	1,117,069		
12.	Outside Michigan	187,054	16.75	8,560
13.	Michigan	930,015	83.25	42,543
14.	Michigan Mixed, Line 5		100.00	579
15.	Divided relatively with the number of Freight and Passenger cars in Mixed Trains.			
16.	Freight		84.09	487
17.	Passenger		15.91	92
18.	System Special, Line 6		100.00	88
19.	Divided relatively with the Total Mileage of Special train locomotives in and outside of Michigan	2,593		
20.	Outside Michigan	513	19.78	17
21.	Michigan	2,080	80.22	71

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 308. Steam Locomotives—Repairs (Continued).

			%	$
22.	Michigan Special, Line 21		100.00	71
23	Divided relatively with the Michigan Mileage of Special train locomotives in Mixed and Passenger Services	2,080		
24.	Mixed	1,394	67.02	48
25.	Passenger	686	32.98	23
26.	Michigan Special Mixed, Line 24		100.00	48
27.	Divided relatively with the number of Freight and Passenger cars in Mixed Trains			
28.	Freight		84.09	40
29.	Passenger		15.91	8
30.	Michigan Special Passenger Recap:			
31.	Exclusive, Line 25			23
32.	Mixed, Line 29			8
33.	Total Michigan Special Passenger			31
34.	System Yard Switching, Line 7		100.00	14,408
35.	Divided relatively with the Total Yard Switching miles in and outside of Michigan	296,924		
36.	Outside Michigan	9,342	3.15	454
37.	Michigan	287,582	96.85	13,954
38.	Michigan Yard Switching, Line 37		100.00	13,954
39.	Divided on Michigan Total Yard Switching miles, Ratio No. 13 a.			
40.	Freight		97.46	13,600
41.	Passenger		2.54	354

No. 308—Steam Locomotives—Repairs (Continued).

			%	$
42.	System Regular Passenger, Line 9		100.00	35,159
43.	Divided relatively with the Revenue Mileage of Regular DSS&A Passenger train locomotives in and outside of Michigan	935,536		
44.	Outside Michigan	163,070	17.43	6,128
45.	Michigan	772,466	82.57	29,031
46.	Michigan Passenger Switching Recap:			
47.	Train, Line 8			129
48.	Yard, Line 41			354
49.	Total Michigan Passenger Switching			483
50.	Michigan Revenue Passenger Recap:			
51.	Mixed, Line 17			92
52.	Special, Line 33			31
53.	Regular, Line 45			29,031
54.	Total Michigan Revenue Passenger			29,154
55.	Michigan Passenger Switching, Line 49		100.00	483
56.	Divided on Michigan Total Passenger Switching miles, Ratio No. 13 c.			
57.	Sleepers and Diners		38.87	188
58.	Mail and Express		7.70	37
59.	Passengers and Baggage		53.43	258
60.	Michigan Revenue Passenger, Line 54		100.00	29,154
61.	Divided on Michigan Passenger Gross Ton miles, Ratio No. 1 b.			
62.	Sleepers and Diners		40.20	11,720
63.	Mail and Express		14.63	4,265
64.	Passengers and Baggage		45.17	13,169

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 308, Steam Locomotives—Repairs. (Continued)

		%	$
65.	Michigan Freight Recap:		
66.	Regular, Line 13		42,543
67.	Mixed, Line 16		487
68.	Special, Line 28		40
69.	Yard Switching, Line 40		13,600
70.	Total Michigan Freight		56,670
71.	Michigan Passenger Recap:		
72.	Switching, Line 49		483
73.	Revenue, Line 54		29,154
74.	Total Michigan Passenger		29,637
75.	Michigan Sleepers and Diners Recap:		
76.	Switching, Line 57		188
77.	Revenue, Line 62		11,720
78.	Total Michigan Sleepers and Diners		11,908
79.	Michigan Mail and Express Recap:		
80.	Switching, Line 58		37
81.	Revenue, Line 63		4,265
82.	Total Michigan Mail and Express		4,302
83.	Michigan Passengers and Baggage Recap:		
84.	Switching, Line 59		258
85.	Revenue, Line 64		13,169
86.	Total Michigan Passengers and Baggage		13,427
87.	Michigan Passengers and Baggage, Line 86	100.00	13,427
88.	Divided on Michigan Passenger Miles, Ratio No. 10.		
89.	Interstate	29.19	3,919
90.	Intrastate	70.81	9,508

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 309, Steam Locomotives—Depreciation.

			%	$
1.	System Total, per Annual Report			23,012
2.	Divided to Services (Hillman data)			
3.	Mineral Range Passenger (all Michigan)			325
4.	Regular Freight			12,470
5.	Mixed (all Michigan)			155
6.	Special			29
7.	Yard Switching			3,369
8.	Passenger Train Switching (all Michigan)			21
9.	Regular Passenger			6,643
10.	System Regular Freight, Line 4		100.00	12,470
11.	Divided relatively with the total mileage of Regular Freight train locomotives in and outside of Michigan	1,117,069		
12.	Outside Michigan	187,054	16.75	2,089
13.	Michigan	930,015	83.25	10,381
14.	Michigan Mixed, Line 5		100.00	155
15.	Divided relatively with the number of Freight and Passenger cars in Mixed trains.			
16.	Freight		84.09	130
17.	Passenger		15.91	25
18.	System Special, Line 6		100.00	29
19.	Divided relatively with the total mileage of Special train locomotives in and outside of Michigan	2,593		
20.	Outside Michigan	513	19.78	6
21.	Michigan	2,080	80.22	23

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 309, Steam Locomotives—Depreciation (continued).

			%	$
22.	Michigan Special, Line 21		100.00	23
23.	Divided relatively with the Michigan mileage of Special train locomotives in Mixed and Passenger Services	2,080		
24.	Mixed	1,394	67.02	15
25.	Passenger	686	32.93	8
26.	Michigan Special Mixed, Line 24		100.00	15
27.	Divided relatively with the number of Freight and Passenger cars in Mixed trains.			
28.	Freight		84.09	13
29.	Passenger		15.91	2
30.	Michigan Special Passenger Recap:			
31.	Exclusive, Line 25			8
32.	Mixed, Line 29			2
33.	Total Michigan Special Passenger			10
34.	System Yard Switching, Line 7		100.00	3,369
35.	Divided relatively with the total yard switching miles in and outside of Michigan	296,924		
36.	Outside Michigan	9,342	3.15	106
37.	Michigan	287,582	96.85	3,263
38.	Michigan Yard Switching, Line 37		100.00	3,263
39.	Divided on Michigan Total Yard Switching miles, Ratio No. 13a.			
40.	Freight		97.46	3,180
41.	Passenger		2.54	83

No. 309, Steam Locomotives—Depreciation (continued).

			%	$
42.	System Regular Passenger, Line 9		100.00	6,643
43.	Divided relatively with the Revenue mileage of Regular DSS&A passenger train locomotives in and outside of Michigan.	935,536		
44.	Outside Michigan	163,070	17.43	1,158
45.	Michigan	772,466	82.57	5,485
46.	Michigan Passenger Switching Recap;			
47.	Train, Line 8			21
48.	Yard, Line 41			83
49.	Total Michigan Passenger Switching			104
50.	Michigan Revenue Passenger Recap:			
51.	Mixed, Line 17			25
52.	Special, Line 33			10
53.	Regular, Line 45			5,485
54.	Total Michigan Revenue Passenger			5,520
55.	Michigan Passenger Switching, Line 49		100.00	104
56.	Divided on Michigan Total Passenger Switching Miles, Ratio No. 13c.			
57.	Sleepers and Diners		38.87	40
58.	Mail and Express		7.70	8
59.	Passengers and Baggage		53.43	56
60.	Michigan Revenue Passenger, Line 54		100.00	5,520
61.	Divided on Michigan Passenger Gross Ton miles, Ratio No. 1b.			
62.	Sleepers and Diners		40.20	2,219
63.	Mail and Express		14.63	808
64.	Passengers and Baggage		45.17	2,492

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 309, Steam Locomotives—Depreciation (continued).

		%	$
65.	Michigan Freight Recap:		
66.	Regular, Line 13		10,381
67.	Mixed, Line 16		130
68.	Special, Line 28		13
69.	Yard Switching, Line 40		3,180
70.	Total Michigan Freight		13,704
71.	Michigan Passenger Recap:		
72.	Switching, Line 49		104
73.	Revenue, Line 54		5,520
74.	Total Michigan Passenger		5,624
75.	Michigan Sleepers and Diners Recap:		
76.	Switching, Line 57		40
77.	Revenue, Line 62		2,219
78.	Total Michigan Sleepers and Diners		2,259
79.	Michigan Mail and Express Recap:		
80.	Switching, Line 58		8
81.	Revenue, Line 63		808
82.	Total Michigan Mail and Express		816
83.	Michigan Passengers and Baggage Recap:		
84.	Switching, Line 59		56
85.	Revenue, Line 64		2,493
86.	Total Michigan Passengers and Baggage		2,549
87.	Michigan Passengers and Baggage, Line 86	100.00	2,549
88.	Divided on Michigan Passenger Miles, Ratio No. 10		
89.	Interstate	29.19	744
90.	Intrastate	70.81	1,805

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 310. Steam Locomotives—Retirements.

			%	$
1.	System Total, per Annual Report, $832; assigned to Michigan.			809
2.	Allocated to Services			
3.	Regular Freight			58*
4.	Yard Switching			636
5.	Work			9
6.	Regular Passenger			22
7.	Michigan Yard Switching, Line 4		100.00	836
8.	Divided on Michigan Total Yard Switching miles, Ratio No. 13a.			
9.	Freight		97.46	815
10.	Passenger		2.54	21
11.	Michigan Work, Line 5		100.00	9
12.	Divided relatively with the charges to Michigan Freight and Passenger in Account No. 326	$5,446		
13.	Freight	4,266	78.34	7
14.	Passenger	1,180	21.66	2
15.	Michigan Freight Recap:			
16.	Regular, Line 3			58*
17.	Yard Switching, Line 9			815
18.	Work, Line 13			7
19.	Total Michigan Freight			764
20.	Michigan Passenger Recap:			
21.	Regular, Line 6			22
22.	Yard Switching, Line 10			21
23.	Work, Line 14			2
24.	Total Michigan Passenger			45

*Typewritten figures in red.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 310—Steam Locomotives—Retirements (Continued).

		%	$
25.	Michigan Passenger, Line 24	100.00	45
26.	Divided on Michigan Passenger Gross Ton-miles, Ratio No. 1b.		
27.	Sleepers and Diners	40.20	18
28.	Mail and Express	14.63	7
29.	Passengers and Baggage	45.17	20
30.	Michigan Passengers and Baggage, Line 29	100.00	20
31.	Divided on Michigan Passenger miles, Ratio No. 10		
32.	Interstate	29.19	6
33.	Intrastate	70.81	14

No. 314—Freight Train Cars—Repairs.

No. 315—Freight Train Cars—Depreciation.

No. 316—Freight Train Cars—Retirements.

	No. 314 $	No. 315 $	No. 316 $
1. System Total, per Annual Report	193,181	60,752	4,349
2. Assigned to Michigan by Delf All Freight.	119,806	52,292	3,742

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 317—Passenger-train Cars—Repairs.

No. 318—Passenger-train Cars—Depreciation

			No. 317	No. 318
		%	$	$
1. System Total, per Annual Report (all passenger)			46,155	12,367
2. Allocated to Services.				
3. Sleeper			5,455(a)	2,684
4. Diner and Observation			3,850(a)	2,421
5. Mail and Express and Passengers and Baggage			36,850	7,262
7. Sleeper			5,455	2,684
8. Diner and Observation			3,850	2,421
9. Total System Sleepers and Diners			9,305	5,105
10. System Sleepers and Diners, Line 9		100.00	9,305	5,105
11. Divided relatively with the Total Mileage of Sleepers and Diners in and outside of Michigan (including mileage on Mineral Range)	1,069,347			
12. Outside Michigan	227,767	21.30	1,982	1,087
13. Michigan	841,580	78.70	7,323	4,018
14. System Mail and Express and Passenger and Baggage, Line 5		100.00	36.850	7,262
15. Divided on Total DSS&A Passenger car miles, Ratio No. 3c				
16. Outside Michigan		18.14	6,684	1,318
17. Michigan—Mineral Range		4.13	1,522	300
18. Michigan—D.S.S.&A.		77.73	28,644	5,645

No. 317—Passenger train Cars—Repairs (Continued).

No. 318—Passenger train Cars—Depreciation (Continued).

		%	$
19. Michigan DSS&A Mail and Express and Passengers and Baggage, Line 18	100.00	28,644	5,645
20. Divided on Michigan DSS&A Passenger car miles, Ratio No. 3d			
21. Mail and Express	25.42	7,281	1,435
22. Passengers and Baggage	74.58	21,363	4,210
23. Michigan Passengers and Baggage, Line 22	100.00	21,363	4,210
24. Divided on Michigan Passenger Miles, Ratio No. 10			
25. Interstate	29.19	6,236	1,229
26. Intrastate	70,81	15,127	2,981

Note:—(a) These amounts are the charges on account of these services for 1914, the last year for which we have been able to ascertain these expenses.

The present classification requires that primary accounts involving expenditures for operations of this kind shall be kept so that they may be ascertained, but the Company has not kept its accounts in that manner, and we are advised that the figures cannot now be had.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 326. Work Equipment—Repairs.
No. 327. Work Equipment—Depreciation.
No. 328. Work Equipment—Retirements.

			No. 326	No. 327	No. 328
		%	$	$	$
1. System Totals, per Annual Report		100.00	6,599	3,483	8*
2. Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 202 to 225 inclusive, 241, 243, 247, 249 and 272 (see detail page following)	$479,970				
3. Outside Michigan	83,380	17.47	1,153	608	1*
4. Michigan	396,140	82.53	5,446	2,875	7*
5. Michigan Total, Line 4		100.00	5,446	2,875	7*
6. Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 225 inclusive, 241, 243, 247, 249 and 272 (see detail page following)	$396,140				
7. Freight	310,320	78.34	4,266	2,252	5*
8. Passenger	85,820	21.66	1,180	623	2*
9. Michigan Passenger, Line 8		100.00	1,180	623	2*
10. Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 225 inclusive, 241, 243, 247, 249 and 272 (see detail page following)	$ 85,820				
11. Sleepers and Diners	30,621	35.68	421	222	1*
12. Mail and Express	12,518	14.59	172	91	0*
13. Passengers and Baggage	42,681	49.73	587	310	1*
14. Michigan Passengers and Baggage, Line 13.		100.00	587	310	1*
15. Divided on Michigan Passenger Miles, Ratio No. 10.					
16. Interstate		29.19	171	90	0*
17. Intrastate		70.81	416	220	1*

*Typewritten figures in red.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

Details for Dividing Accounts Nos. 326, 327 and 328.

Acct. No.	System Total	Outside Michigan	—MICHIGAN—					
			Total	Freight	Passenger. Total	Sleepers and Diners	Mail and Express	Passengers and Baggage
	$	$	$	$	$	$	$	$
202	67,951	9,959	57,992	45,926	12,066	3,557	1,786	6,723
208	60,062	14,175	45,887	34,927	10,960	3,231	1,622	6,107
212	70,021	13,642	56,379	43,252	13,127	5,175	1,898	6,054
214	5,433	772	4,661	3,576	1,085	428	157	500
216	23,218	3,121	20,097	15,418	4,679	1,844	677	2,158
218	3,035	59	2,976	2,283	693	273	100	320
220	180,349	34,736	145,613	111,709	33,904	13,365	4,903	15,636
221	6,928	847	6,081	4,816	1,265	373	187	705
223	432	236	196	156	40	12	6	22
225	1,667	763	904	716	188	55	28	105
241	1,316		1,316	1,185	131	43	17	71
243	12,812		12,812	12,812				
247	3,487	514	2,973	2,328	645	190	96	359
249	279	101	178	169	9	3	1	5
272	42,980	4,905	38,075	31,047	7,028	2,072	1,040	3,916
Total	479,970	83,830	396,140	310,320	85,820	30,621	12,518	42,681

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 332, Injuries to Persons.

			%	$
1.	System Total, per Annual Report			4,325
2.	Allocated to Services by Delf.			
3.	Freight			3,985
4.	Common Freight and Passenger			255
5.	Passenger			85
6.	System Freight, Line 3		100.00	3,985
7.	Divided relatively with the total mileage of Freight Train Cars in and outside of Michigan (Delf's Ex.)			
8.	Outside Michigan		13.93	555
9.	Michigan		86.07	3,430
10.	System Passenger, Line 5		100.00	85
11.	Divided relatively with the total mileage of Passenger Train Cars in and outside of Michigan (Delf's Ex.)			
12.	Outside Michigan		16.85	14
13.	Michigan		83.15	71
14.	System Common, Line 4		100.00	255
15.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$294,924		
16.	Outside Michigan	44,353	15.04	38
17.	Michigan	250,571	84.96	217
18.	Michigan Common, Line 17		100.00	217
19.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$247,526		
20.	Freight	180,742	73.02	158
21.	Passenger	66,784	26.98	59

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 332, Injuries to Persons (continued).

			%	$
22.	Michigan Freight Recap:			
23.	Exclusive, Line 9			3,430
24.	Common, Line 20			158
25.	Total Michigan Freight			3,588
26.	Michigan Passenger Recap:			
27.	Exclusive, Line 13			71
28.	Common, Line 21			59
29.	Total Michigan Passenger			130
30.	Michigan Passenger, Line 29		100.00	130
31.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$66,784		
32.	Sleepers and Diners	19,652	29.43	38
33.	Mail and Express	11,755	17.60	23
34.	Passengers and Baggage	35,377	52.97	69
35.	Michigan Passengers and Baggage, Line 34		100.00	69
36.	Divided on Michigan Passenger miles, Ratio No. 10			
37.	Interstate		29.19	20
38.	Intrastate		70.81	49

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 333—Insurance.

			%	$
1.	System Total, per Annual Report, $2,417; allocated to Michian			2,075
2.	Allocated to Services			
3.	Freight			1,031
4.	Common Freight and Passenger			753
5.	Passenger			291
6.	Michigan Common, Line 4		100.00	753
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 308, 314, 317 and 326 (see detail page following Accounts No. 301)	$247,526		
8.	Freight	180,742	73.02	550
9.	Passenger	66,784	26.98	203
10.	Michigan Freight Recap:			
11.	Exclusive, Line 3			1,031
12.	Common, Line 8			550
13.	Total Michigan Freight			1,581
14.	Michigan Passenger Recap:			
15.	Exclusive, Line 5			291
16.	Common, Line 9			203
17.	Total Michigan Passenger			494
18.	Michigan Passenger, Line 17		100.00	494
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$ 66,784		
20.	Sleepers and Diners	19,652	29.43	145
21.	Mail and Express	11,755	17.60	87
22.	Passengers and Baggage	35,377	52.97	262

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 333—Insurance (Continued).

		%	$
23.	Michigan Passengers and Baggage, Line 22	100.00	262
24.	Divided on Michigan Passenger Miles, Ratio No. 10		
25.	Interstate	29.19	76
26.	Intrastate	70.81	186

NOTE:—Delf divides the Michigan Common portion of this charge as follows:

Miscellaneous Buildings, other than Marquette Shops	$ 42.80
Contents of Roundhouses	29.20
Marquette Electric Light Plant	24.00
Marquette Shops (Contents)	479.20
Locomotives	206.25
Work Cars	43.20
Total	$824.65

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 334. Stationery and Printing.

			%	$
1.	System Total, per Annual Report		100.00	1,316
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$294,924		
3.	Outside Michigan	44,353	15.04	198
4.	Michigan	250,571	84.96	1,118
5.	Michigan Total, Line 4		100.00	1,118
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$247,526		
7.	Freight	180,742	73.02	816
8.	Passenger	66,784	26.98	302
9.	Michigan Passenger, Line 8		100.00	302
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$ 66,784		
11.	Sleepers and Diners	19,652	29.43	89
12.	Mail and Express	11,755	17.60	53
13.	Passengers and Baggage	35,377	52.97	160
14.	Michigan Passengers and Baggage, Line 13		100.00	160
15.	Divided on Michigan Passenger Miles, Ratio No. 10.			
16.	Interstate		29.19	47
17.	Intrastate		70.81	113

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 336—Maintaining Joint Equipment at Terminals—Dr.

			%	$
1.	System Total, per Annual Report, $792; allocated to Michigan by Delf		100.00	15
2.	Allocated to Services by Delf			
3.	Freight			8
4.	Passenger			7
5.	Michigan Passenger, Line 4		100.00	7
6.	Divided relatively with the charges to Michigan Passenger Services in Account No. 326	$1,180		
7.	Sleepers and Diners	421	35.68	2
8.	Mail and Express	172	14.59	1
9.	Passengers and Baggage	587	49.73	4
10.	Michigan Passengers and Baggage, Line 9		100.00	4
11.	Divided on Michigan Passenger Miles, Ratio No. 10			
12.	Interstate		29.19	1
13.	Intrastate		70.81	3

III. Traffic.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

III. Traffic.

No. 351, Superintendence.

		%	$
1.	System Total, per Annual Report		31,60
2.	Allocated to Services by Delf.		
3.	Freight		17,56
4.	Passenger (all Passengers and Baggage)		14,04
5.	System Freight, Line 3	100.00	17,56
6.	Divided on System Revenue Freight train miles, Ratio No. 11a.		
7.	Outside Michigan	17.19	3,01
8.	Michigan	82.81	14,54
9.	System Passengers and Baggage, Line 4	100.00	14,04
10.	Divided on System Revenue Passenger train miles, Ratio 11b.		
11.	Outside Michigan	17.54	2,46
12.	Michigan	82.46	11,58
13.	Michigan Passengers and Baggage, Line 12	100.00	11,58
14.	Divided on Mich. Passenger miles, Ratio No. 10		
15.	Interstate	29.19	3,38
16.	Intrastate	70.81	8,20

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 352—Outside Agencies.

			%	$
1.	System Total, per Annual Report			35,100
2.	Allocated to Services by Delf.			
3.	Freight			17,866
4.	Passenger (all Passengers and Baggage)			17,234
5.	System Freight, Line 3		100.00	17,866
6.	Divided on System Revenue Freight Train miles, Ratio No. 11a.			
7.	Outside Michigan		17.19	3,071
8.	Michigan		82.81	14,795
9.	System Passengers and Baggage, Line 4		100.00	17,234
10.	Divided on System Revenue Passenger train miles, Ratio No. 11b.			
11.	Outside Michigan		17.54	3,023
12.	Michigan		82.46	14,211
13.	Michigan Passengers and Baggage, Line 12		100.00	14,211
14.	Divided, by agreement, on the basis of the allocations and assignments of the years 1910, 1911, 1912 and 1913	134,057		
15.	Interstate	123,373	92.03	13,078
16.	Intrastate	10,684	7.97	1,133

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 353—Advertising.

			%	$
1.	System Total, per Annual Report			4,078
2.	Allocated to Services by Delf			
3.	Freight			52
4.	Passenger (all Passengers and Baggage)			4,026
5.	System Freight, Line 3		100.00	52
6.	Divided on System Revenue Freight train miles, Ratio No. 11a.			
7.	Outside Michigan		17.19	9
8.	Michigan		82.81	43
9.	System Passengers and Baggage, Line 4		100.00	4,026
10.	Divided on System Revenue Passenger Train miles, Ratio No. 11b.			
11.	Outside Michigan		17.54	706
12.	Michigan		82.46	3.320
13.	Michigan Passengers and Baggage, Line 12		100.00	3,320
14.	Divided, by agreement, on the basis of the allocations and assignments of the years 1910, 1911, 1912 and 1913	18,909		
15.	Interstate	13,057	69.06	2,293
16.	Intrastate	5,852	30.94	1,027

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 354, Traffic Associations.

1. System Total, per Annual Report, $278; allocated to Michigan by Delf.	$
All Freight.	230

No. 355, Fast Freight Lines.

1. System Total, per Annual Report, $10*; allocated to Michigan by Delf.	$
All Freight.	8*

*Typewritten figures in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 356, Industrial and Immigration Bureaus.

1.	System Total, per Annual Report		% 100.00	$ 8,4
2.	Divided on basis of Delf's System Freight and Passenger Revenue	$3,320,130		
3.	Freight	2,316,448	69.77	5,9
4.	Passenger (all Passengers and Baggage)	1,003,682	30.23	2,5
5.	System Freight, Line 3		100.00	5,9
6.	Divided on basis of Delf's System Freight Revenue	2,316,448		
7.	Outside Michigan	248,889	10.74	6
8.	Michigan	2,067,559	89.26	5,2
9.	System Passengers and Baggage, Line 4		100.00	2,5
10.	Divided on basis of Delf's System Passenger Revenue	1,003,682		
11.	Outside Michigan	138,416	13.80	3
12.	Michigan	865,266	86.20	2,2
13.	Michigan Passengers and Baggage, Line 12		100.00	2,2
14.	Divided on Michigan Passenger miles, Ratio No. 10.			
15.	Interstate		29.19	6
16.	Intrastate		70.81	1,5

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 357—Insurance

		%	$
1.	System Total, per Annual Report, $113; allocated to Michigan by Delf. (all Passengers and Baggage		59
2.	Michigan Passengers and Baggage, Line 1	100.00	59
3.	Divided on Michigan Passenger miles, Ratio No. 10		
4.	Interstate	29.19	17
5.	Intrastate	70.81	42

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1916.

No. 358, Stationery and Printing.

		%	$
1	System Total, per Annual Report		9,38
2.	Allocated to Services by Delf.		
3	Freight		5,58
4.	Passenger (all Passengers and Baggage)		3,80
5.	System Freight, Line 3	100.00	5,58
6.	Divided on System Revenue Freight train miles, Ratio No. 11a.		
7.	Outside Michigan	17.19	95
8.	Michigan	82.81	4,62
9.	System Passengers and Baggage, Line 4	100.00	3,80
10.	Divided on System Revenue Passenger train miles, Ratio No. 11b.		
11.	Outside Michigan	17.54	66
12.	Michigan	82.46	3,13
13.	Michigan Passengers and Baggage, Line 12	100.00	3,13
14.	Divided on Michigan Passenger miles, Ratio No. 10		
15.	Interstate	29.19	91
16.	Intrastate	70.81	2,22

IV. Transportation—Rail Line.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

IV. TRANSPORTATION—RAIL LINE.

No. 371—Superintendence.

			%	$
1.	System Total, per Annual Report			20,755
2.	Assigned to Services			
3.	Freight (85% of Car Accountant's Pay Roll)			3,843
4.	Passenger (15% of Car Accountant's Pay Roll)			678
5.	Common Freight and Passenger (all other than Car Accountant's Pay Roll)			16,234
6.	System Freight, Line 3		100.00	3,843
7.	Divided relatively with the Total Mileage of Freight Train Cars in and outside of Michigan (Delf's Ex.)	19,670,784		
8.	Outside Michigan	2,738,216	13.92	535
9.	Michigan	16,932,568	86.08	3,308
10.	System Passenger, Line 4		100.00	678
11	Divided relatively with the total mileage of Passenger Train Cars in and outside of Michigan (Delf's Ex.)	4,380,236		
12.	Outside Michigan	737,908	16.85	114
13.	Michigan	3,642,328	83.15	564
14.	Michigan Passenger, Line 13		100.00	564
15.	Divided on Michigan Total Passenger Train Car Miles, Ratio No. 3			
16.	Sleepers and Diners		29.48	166
17.	Mail and Express		14.80	84
18.	Passengers and Baggage		55.72	314

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 371—Superintendence (Continued)

			%	$
19.	System Common, Line 5		100.00	16,234
20.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 372 to 420 inclusive except 407 and 410 (see detail page following)	$ 1,190,363		
21.	Outside Michigan	175,076	14.71	2,388
22.	Michigan	1,015,287	85.29	13,846
23.	Michigan Common, Line 22		100.00	13,846
24.	Divided relatively with the total of charges to Michigan Freight and Passenger (M. R. and D. S. S. & A.) in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following)	$1,006,267		
25.	Freight	714,446	71.00	9,831
26.	Passenger—M. R.	12,105	1.20	166
27.	Passenger—D. S. S. & A.	279,716	27.80	3,849
28.	Michigan D. S. S. & A. Passenger, Line 27		100.00	3,849
29.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following)	$ 279,716		
30.	Sleepers and Diners	94,716	33.86	1,303
31.	Mail and Express	34,667	12.39	477
32.	Passengers and Baggage	150,333	53.75	2,069
33.	Michigan Freight Recap.:			
34.	Car Accountant's Pay Roll, Line 9			3,308
35.	Other, Line 25			9,831
36.	Total Michigan Freight			13,139

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 371—Superintendence (Continued).

		%	$
37.	Michigan Passenger Recap.:		
38.	Car Accountant's Pay Roll, Line 13		564
39.	Other, Line 27		3,849
40.	Total Michigan Passenger		4,413
41.	Michigan Sleepers and Diners Recap.:		
42.	Car Accountant's Pay Roll, Line 16		166
43.	Other, Line 30		1,303
44.	Total Michigan Sleepers and Diners		1,469
45.	Michigan Mail and Express Recap.:		
46.	Car Accountant's Pay Roll, Line 17		84
47.	Other, Line 31		477
48.	Total Michigan Mail and Express		561
49.	Michigan Passengers and Baggage Recap.:		
50.	Car Accountant's Pay Roll, Line 18		314
51.	Other, Line 32		2,069
52.	Total Michigan Passengers and Baggage		2,383
53.	Michigan Passengers and Baggage, Line 52	100.00	2,383
54.	Divided on Michigan Passenger Miles, Ratio No. 10		
55.	Interstate	29.19	696
56.	Intrastate	70.81	1,687

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Details for Dividing Accounts Nos. 371, 407, 410, 411, 412, 413, 414, 415, 416, 417 and 420.

Acct. No.	System Total	Outside Michigan	Michigan						
			Total	Freight	Mineral Range Passenger	D. S. S. & A. Passenger			
						Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
	$	$	$	$	$	$	$	$	$
372	12,804	1,888	10,916	8,548		2,368	698	350	1,320
373	159,423	17,851	141,572	118,101		23,471		2,347	21,124
374	2,033	350	1,683	1,683					
375	25,323		25,323	25,323					
376	10,710	959	9,751	7,512		2,239			2,239
377	4,743		4,743	4,644		99	57	2	40
378	48,036	1,178	46,858	45,684		1,174	585	63	526
379	4,209	11	4,198	4,066		132	75	3	54
380	34,640	995	33,645	32,800		845	427	43	375
382	29,504	1,215	28,289	27,572		717	360	37	320
385	1,821	90	1,731	1,681		50	21	4	25
386	581	12	569	559		10	5		5
387	433	7	426	419		7	4		3
388	15,814	325	15,489	15,157		332	174	14	144
389	1,386	26	1,360	1,315		45	26	1	18
390	25,994	8,782	17,212	11,013		6,199	2,492	907	2,800
391	*13,477		*13,477	*11,729		*1,748	*703	*256	*789
392	174,317	28,858	145,459	84,913	3,180	57,366	23,061	8,393	25,912
394	301,342	50,088	251,254	164,708	4,548	81,998	32,963	11,996	37,039
397	14,354	2,386	11,968	7,846	217	3,905	1,570	571	1,764
398	5,615	934	4,681	3,068	85	1,528	614	224	690
399	2,667	445	2,222	1,456	28	738	297	108	333
400	45,259	5,930	39,329	22,930		16,399	6,592	2,399	7,408
401	201,769	34,270	167,499	114,921	2,847	49,731	8,368	4,210	37,153
402	34,399	5,779	28,620	6,457	1,200	20,963	6,333	3,186	11,444
403	13,954	3,388	10,566			10,566	10,566		
404	1,540	1,229	311	295		16	5	2	9
405	8,639	480	8,159	7,731		428	126	63	239
418	6,971	1,198	5,773	5,773					
419	155	17	138			138			138
Total	1,174,958	168,691	1,006,267	714,446	12,105	279,716	94,716	34,667	150,333
411	1,214	217	997						
412	4,502	3,419	1,083						
413	*4,928	*1,450	*3,478						
414	1,827	384	1,443						
415	1,151	86	1,065						
416	599	5	594						
417	422	22	400						
420	10,618	3,702	6,916						
	1,190,363	175,076	1,015,287						

* Typewritten in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 372—Dispatching Trains.

			%	$
1.	System Total, per Annual Report		100.00	12,804
2.	Divided on System Time, Ratio No. 4a.			
3.	Freight		77.77	9,958
4.	Passenger		22.23	2,846
5.	System Freight, Line 3		100.00	9,958
6.	Divided relatively with the total mileage of Freight trains (including proportion of Mixed and Special) plus Train and Yard Switching, in and outside of Michigan	1,361,430		
7.	Outside Michigan	192,765	14.16	1,410
8.	Michigan	1,168,665	85.84	8,548
9.	System Passenger, Line 4		100.00	2,846
10.	Divided relatively with the total mileage of Passenger trains (including C&NW and CM&StP operations into Marquette, and proportion of Mixed and Special) plus Train and Yard Switching, in and outside of Michigan	952,590		
11.	Outside Michigan	159,821	16.78	478
12.	Michigan	792,769	83.22	2,368
13.	Michigan Passenger, Line 12		100.00	2,368
14.	Divided on Michigan Total Passenger train Car miles, Ratio No. 3.			
15.	Sleepers and Diners		29.48	698
16.	Mail and Express		14.80	350
17.	Passengers and Baggage		55.72	1,320
18.	Michigan Passengers and Baggage, Line 17		100.00	1,320
19.	Divided on Michigan Passenger miles, Ratio No. 10			
20.	Interstate		29.19	385
21.	Intrastate		70.81	935

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 373—Station Employees.

		%	$
1.	System Total, per Annual Report, $159,423; allocated to Michigan by Delf		141,572
2.	Allocated to Freight and Passenger by us (balance to Common)		
3.	Freight		60,160
4.	Common Freight and Passenger		69,457
5.	Passenger		11,955
6.	Michigan Common, Line 4	100.00	69,457
7.	Divided on Station Pay Roll, Ratio No. 17		
8.	Freight	83.42	57,941
9.	Passenger	16.58	11,516
10.	Michigan Freight Recap.:		
11.	Exclusive, Line 3		60,160
12.	Common, Line 8		57,941
13.	Total Michigan Freight		118,101
14.	Michigan Passenger Recap.:		
15.	Exclusive, Line 5		11,955
16.	Common, Line 9		11,516
17.	Total Michigan Passenger		23,471
18.	10% of Michigan Passenger charged to Mail and Express because of Station Employees having to handle Mail to, from and at Stations		2,347
19.	Balance, all Passengers and Baggage		21,124

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 373—Station Employees (Continued).

20.	Michigan Passengers and Baggage, Line 19	100.00	21,124
21.	Divided on Michigan Passenger miles, Ratio No. 10		
		%	$
22.	Interstate	29.19	6,166
23.	Intrastate	70.81	14,958

NOTE—This account was allocated by us, as indicated above. Of the total Passenger allocation, the following is directly charged labor on account of Mail:

Saulte Ste. Marie	$ 360
Marquette	420
Champion	30
Houghton	270
Total	$1,080

No. 374—Weighing, Inspection and Demurrage Bureaus.
No. 375—Coal and Ore Wharves.

		No. 374	No. 375
		$	$
1.	System Totals, per Annual Report	2,033	25,323
2.	Allocated to Michigan by Delf	1,683	25,323

All Freight.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 376—Station Supplies and Expenses.

			%	$
1.	System Total, per Annual Report, $10,710; allocated to Michigan			9,751
2.	Allocated to Services			
3.	Freight			2,949
4.	Common Freight and Passenger			5,470
5.	Passenger			1,332
6.	Michigan Common, Line 4		100.00	5,470
7.	Divided relatively with the total charges to Michigan Freight and Passenger in Account No. 373	$141,572		
8.	Freight	118,101	83.42	4,563
9.	Passenger	23,471	16.58	907
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			2,949
12.	Common, Line 8			4,563
13.	Total Michigan Freight			7,512
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			1,332
16.	Common, Line 9			907
17.	Total Mich. Passgr. (all Passgr. and Bagg.)			2,239
18.	Michigan Passengers and Baggage, Line 17		100.00	2,239
19.	Divided on Michigan Passenger Miles, Ratio No. 10			
20.	Interstate		29.19	654
21.	Intrastate		70.81	1,585

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 377—Yard Masters and Yard Clerks.
No. 378—Yard Conductors and Brakemen.
No. 379—Yard Switch and Signal Tenders.
No. 380—Yard Enginemen.

		%	No. 377 $	No. 378 $	No. 379 $	No. 380 $
1.	System Total, per Annual Report		4,743	48,036	4,209	34,640
2.	Allocated to Michigan by Delf.		4,743	46,858	4,198	33,645
3.	Marquette Yard		2,818	22,978	3,699	17,183
4.	St. Ignace Yard		0	8,778	17	5,744
5.	Other Yards (all Freight)		1,925	15,102	482	10,718
6.	Marquette Yard, Line 3	100.00	2,818	22,978	3,699	17,183
7.	Divided relatively with the Total Yard Switching miles at Marquette.					
8.	Freight	96.47	2,719	22,167	3,568	16,576
9.	Passenger	3.53	99	811	131	607
10.	St. Ignace Yard, Line 4	100.00	0	8,778	17	5,744
11.	Divided relatively with the Total Yard Switching miles at St. Ignace.					
12.	Freight	95.86	0	8,415	16	5,506
13.	Passenger	4.14	0	363	1	238
14.	Michigan Passenger, Marquette Yard, Line 9	100.00	99	811	131	607
15.	Divided relatively with the Passenger Yard Switching miles at Marquette.					
16.	Sleepers and Diners	57.37	57	465	75	348
17.	Mail and Express	1.92	2	16	3	12
18.	Passengers and Baggage	40.71	40	330	53	247
19.	Michigan Passenger, St. Ignace Yard, Line 13.	100.00	0	363	1	238
20.	Divided relatively with the Passenger cars over St. Ignace Slip Dock.					
21.	Sleepers and Diners	33.09	0	120	0	79
22.	Mail and Express	12.94	0	47	0	31
23.	Passengers and Baggage	53.97	0	196	1	128
24.	Michigan Freight Recap:					
25.	Marquette Yard, Line 8		2,719	22,167	3,568	16,576
26.	St. Ignace Yard, Line 12		0	8,415	16	5,506
27.	Other Yards, Line 5		1,925	15,102	482	10,718
28.	Total Michigan Freight		4,644	45,684	4,066	32,800
29.	Michigan Passenger Recap:					
30.	Marquette Yard, Line 9		99	811	131	607
31.	St. Ignace Yard, Line 13		0	363	1	238
32.	Total Michigan Passenger		99	1,174	132	845

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 377—Yard Masters and Yard Clerks (Continued).
No. 378—Yard Conductors and Brakemen (Continued).
No. 379—Yard Switch and Signal Tenders (Continued).
No. 380—Yard Enginemen (Continued).

	%	No. 377 $	No. 378 $	No. 379 $	No. 380 $
Michigan Sleepers and Diners Recap:					
Marquette Yard, Line 16		57	465	75	348
St. Ignace Yard, Line 21		0	120	0	79
Total Michigan Sleepers and Diners.		57	585	75	427
Michigan Mail and Express Recap:					
Marquette Yard, Line 17		2	16	3	12
St. Ignace Yard, Line 22		0	47	0	31
Total Michigan Mail and Express.		2	63	2	43
Michigan Passengers & Baggage Recap:					
Marquette Yard, Line 18		40	330	53	247
St. Ignace Yard, Line 23		0	196	1	128
Total Michigan Passengers and Baggage.		40	526	54	375
Michigan Passengers and Baggage, Line 44.	100.00	40	526	54	375
Divided on Michigan Passenger miles, Ratio No. 10.					
Interstate	29.19	12	154	16	109
Intrastate	70.81	28	372	38	266

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 382—Fuel for Yard Locomotives.
No. 385—Water for Yard Locomotives.
No. 386—Lubricants for Yard Locomotives.
No. 387—Other Supplies for Yard Locomotives.

		%	No. 382 $	No. 385 $	No. 386 $	No. 387 $
1.	System Total, per Annual Report		29,504	1,821	581	433
2.	Allocated to Michigan by Delf.		28,289	1,731	569	426
3.	Marquette Yard		14,386	547	198	147
4.	St. Ignace Yard		5,059	737	68	50
5.	Other Yards (all Freight)		8,844	447	303	229
6.	Marquette Yard, Line 3	100.00	14,386	547	198	147
7.	Divided relatively with the total Yard Switching miles at Marquette.					
8.	Freight	96.47	13,878	528	191	142
9.	Passenger	3.53	508	19	7	5
10.	St. Ignace Yard, Line 4.	100.00	5,059	737	68	50
11.	Divided relatively with the Total Yard Switching miles at St. Ignace.					
12.	Freight	95.86	4,850	706	65	48
13.	Passenger	4.14	209	31	3	2
14.	Michigan Passenger—Marquette Yard, Line 9	100.00	508	19	7	5
15.	Divided relatively with the Passenger Switching miles at Marquette.					
16.	Sleepers and Diners	57.37	291	11	4	3
17.	Mail and Express	1.92	10	0	0	0
18.	Passengers and Baggage	40.71	207	8	3	2
19.	Michigan Passenger—St. Ignace Yard, Line 13	100.00	209	31	3	2
20.	Divided relatively with the Passenger cars over St. Ignace Slip Dock.					
21.	Sleepers and Diners	33.09	69	10	1	1
22.	Mail and Express	12.94	27	4	0	0
23.	Passengers and Baggage	53.97	113	17	2	1
24.	Michigan Freight Recap:					
25.	Marquette Yard, Line 8		13,878	528	191	142
26.	St. Ignace Yard, Line 12		4,850	706	65	48
27.	Other Yards, Line 5		8,844	447	303	229
28.	Total Michigan Freight		27,572	1,681	559	419
29.	Michigan Passenger Recap:					
30.	Marquette Yard, Line 9		508	19	7	5
31.	St. Ignace Yard, Line 13		209	31	3	2
32.	Total Michigan Passenger		717	50	10	7

No. 382—Fuel for Yard Locomotives (Continued).
No. 385—Water for Yard Locomotives (Continued).
No. 386—Lubricants for Yard Locomotives (Continued).
No. 387—Other Supplies for Yard Locomotives (Continued).

		%	No. 382 $	No. 385 $	No. 386 $	No. 387 $
33.	Michigan Sleepers and Diners Recap:					
34.	Marquette Yard, Line 16		291	11	4	3
35.	St. Ignace Yard, Line 21		69	10	1	1
36.	Total Michigan Sleepers and Diners		360	21	5	4
37.	Michigan Mail and Express Recap:					
38.	Marquette Yard, Line 17		10	0	0	0
39.	St. Ignace Yard, Line 22		27	4	0	0
40.	Total Michigan Mail and Express		37	4	0	0
41.	Michigan Passengers and Baggage Recap:					
42.	Marquette Yard, Line 18		207	8	3	2
43.	St. Ignace Yard, Line 23		113	17	2	1
44.	Total Michigan Passenger and Baggage		320	25	5	3
45.	Michigan Passengers and Baggage, Line 44	100.00	320	25	5	3
46.	Divided on Michigan Passenger miles, Ratio No. 10.					
47.	Interstate	29.19	93	7	1	1
48.	Intrastate	70.81	227	18	4	2

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 388—Enginehouse Expenses—Yard.
No. 389—Yard Supplies and Expenses.

		%	No. 388 $	No. 389 $
1.	System Total, per Annual Report		15,814	1,386
2.	Allocated to Michigan by Delf		15,489	1,360
3.	Marquette Yard		7,497	1,285
4.	St. Ignace Yard		1,630	0
5.	Other Yards (all Freight)		6,362	75
6.	Marquette Yard, Line 3	100.00	7.497	1,285
7.	Divided relatively with the Total Yard Switching miles at Marquette.			
8.	Freight	96.47	7,232	1,240
9.	Passenger	3.53	265	45
10.	St. Ignace Yard, Line 4	100.00	1,630	0
11.	Divided relatively with the Total Yard Switching miles at St. Ignace.			
12.	Freight	95.86	1,563	0
13.	Passenger	4.14	67	0
14.	Michigan Passenger—Marquette Yard, Line 9	100.00	265	45
15.	Divided relatively with the Passenger Yard Switching miles at Marquette.			
16.	Sleepers and Diners	57.37	152	26
17.	Mail and Express	1.92	5	1
18.	Passengers and Baggage	40.71	108	18
19.	Michigan Passenger—St. Ignace Yard, Line 13	100.00	67	0
20.	Divided relatively with the Passenger Cars over St. Ignace Slip Dock.			
21.	Sleepers and Diners	33.09	22	0
22.	Mail and Express	12.94	9	0
23.	Passengers and Baggage	53.97	36	0

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 388—Enginehouse Expenses—Yard.
No. 389—Yard Supplies and Expenses.
(Continued)

		%	No. 388 $	No. 389 $
24.	Michigan Freight Recap:			
25.	Marquette Yard, Line 8		7,232	1,240
26.	St. Ignace Yard, Line 12		1,563	0
27.	Other Yards, Line 5		6,362	75
28.	Total Michigan Freight		15,157	1,315
29.	Michigan Passenger Recap:			
30.	Marquette Yard, Line 9		265	45
31.	St. Ignace Yard, Line 13		67	0
32.	Total Michigan Passenger		332	45
33.	Michigan Sleepers and Diners Recap:			
34.	Marquette Yard, Line 16		152	26
35.	St. Ignace Yard, Line 21		22	0
36.	Total Michigan Sleepers and Diners		174	26
37.	Michigan Mail and Express Recap:			
38.	Marquette Yard, Line 17		5	1
39.	St. Ignace Yard, Line 22		9	0
40.	Total Michigan Mail and Express		14	1
41.	Michigan Passengers and Baggage Recap:			
42.	Marquette Yard, Line 18		108	18
43.	St. Ignace Yard, Line 23		36	0
44.	Total Michigan Passgrs. and Baggage		144	18
45.	Michigan Passengers and Baggage, Line 44	100.00	144	18
46.	Divided on Michigan Passenger miles, Ratio No. 10			
47.	Interstate	29.19	42	5
48.	Intrastate	70.81	102	13

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 390—Operating Joint Yards and Terminals—Dr.

		%	$
1.	System Total, per Annual Report, $25,994; allocated to Michigan by Delf.		17,21
2.	Allocated to Services by Delf.		
3.	Freight		11,01
4.	Passenger		6,19
5.	Michigan Passenger, Line 4	100.00	6,19
6.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1b.		
7.	Sleepers and Diners	40.20	2,49
8.	Mail and Express	14.63	90
9.	Passengers and Baggage	45.17	2,80
10.	Michigan Passengers and Baggage, Line 9	100.00	2,80
11.	Divided on Michigan Passenger Miles, Ratio No. 10.		
12.	Interstate	29.19	81
13.	Intrastate	70.81	1,98

PAGE CUT OFF

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 391—Operating Joint Yards and Terminals—Cr.

			%	$
1.	System Total, per Annual Report, *$13,477; allocated to Michigan by Delf.			*13,477
2.	Allocated to Services by Delf.			
3.	Freight			*10,734
4.	Common Freight and Passenger			*2,612
5.	Passenger			*131
6.	Michigan Common, Line 4		100.00	*2,612
7.	Divided by Delf relatively with the number of Train locomotives handled at Soo Roundhouse	1,473		
8.	Freight	446	29.20	*762
9.	Mixed	106	10.60	*277
10.	Passenger	921	60.20	*1,573
11.	Michigan Common Mixed, Line 9		100.00	*277
12	Divided by Delf relatively with the number of Freight and Passenger cars in Mixed Trains.			
13.	Freight		84.08	*233
14	Passenger		15.92	*44
15.	Michigan Freight Recap:			
16.	Exclusive, Line 3			*10,734
17.	Common Regular, Line 8			*762
18.	Common Mixed, Line 13			*233
19.	Total Michigan Freight			*11,729
20.	Michigan Passenger Recap:			
21.	Exclusive, Line 5			*131
22.	Common Regular, Line 10			*1,573
23.	Common Mixed, Line 14			*44
24.	Total Michigan Passenger			*1,748

*Typewritten in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 391—Operating Joint Yards and Terminals—Cr. (Continued).

		%	$
25.	Michigan Passenger, Line 24	100.00	*1,748
26.	Divided on Michigan Passenger Gross Ton-miles, Ratio No. 1b.		
27.	Sleepers and Diners	40.20	*703
28.	Mail and Express	14.63	*256
29.	Passengers and Baggage	45.17	*789
30.	Michigan Passengers and Baggage, Line 29	100.00	*789
31.	Divided on Michigan Passenger miles, Ratio No. 10.		
32.	Interstate	29.19	*230
33	Intrastate	70.81	*559

*Typewritten in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 392—Train Enginemen.

			%	$
1.	System Total, per Annual Report			174,317
2.	Assigned to Services by Delf.			
3.	Freight			101,729
4.	Passenger			72,588
5.	System Freight, Line 3		100.00	101,729
6.	Divided relatively with the Total Mileage of Freight train locomotives (including proportions of Mixed and Special) in and outside of Michigan	1,132,677		
7.	Outside Michigan	187,262	16.53	16,816
8.	Michigan	945,415	83.47	84,913
9.	System Passenger, Line 4		100.00	72,588
10.	Divided relatively with the Total Mileage of D. S. S. & A. Passenger trains Locomotives (including proportion of Mixed and Special) in and outside of Michigan and on Mineral Range and D. S. S. & A.	984,825		
11.	Outside Michigan	163,375	16.59	12,042
12.	Michigan—Mineral Range	43,182	4.38	3,180
13.	Michigan—D. S. S. & A.	778,268	79.03	57,366
14.	Michigan D. S. S. & A. Passenger, Line 13		100.00	57,366
15.	Divided on Michigan Passenger Gross Ton-miles, Ratio No. 1b.			
16.	Sleepers and Diners		40.20	23,061
17.	Mail and Express		14.63	8,393
18	Passengers and Baggage		45.17	25,912
19.	Michigan Passengers and Baggage, Line 18		100.00	25,912
20.	Divided on Michigan Passenger miles, Ratio No. 10.			
21.	Interstate		29.19	7,564
22.	Intrastate		70.81	18,348

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 394—Fuel for Train Locomotives.

			%	$
1.	System Total, per Annual Report			301,342
2.	Divided to Services.			
3.	Regular Freight			196,008
4.	Mixed (all Michigan)			1,584
5.	Special			441
6.	Regular Passenger			103,309
7.	System Regular Freight, Line 3		100.00	196,008
8.	Divided relatively with the total mileage of Regular Freight train locomotives in and outside of Michigan	1,117,069		
9.	Outside Michigan	187,054	16.75	32,831
10.	Michigan	930,015	83.25	163,177
11.	Michigan Mixed, Line 4		100.00	1,584
12.	Divided relatively with the number of Freight and Passenger cars in Mixed Trains.			
13.	Freight		84.09	1,332
14.	Passenger		15.91	252
15.	System Special, Line 5		100.00	441
16.	Divided relatively with the total mileage of Special train locomotives in and outside of Michigan	2,593		
17.	Outside Michigan	513	19.78	87
18.	Michigan	2,080	80.22	354
19.	Michigan Special, Line 18		100.00	354
20.	Divided relatively with the Michigan mileage of Special train locomotives in Mixed and Passenger Services	20,080		
21.	Mixed	1,394	67.02	237
22.	Passenger	686	32.98	117

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 394—Fuel for Train Locomotives (Continued).

			%	$
23.	Michigan Special Mixed, Line 21		100.00	237
24.	Divided relatively with the number of Freight and Passenger cars in Mixed trains.			
25.	Freight		84.09	199
26.	Passenger		15.91	38
27.	Michigan Special Passenger Recap.:			
28.	Exclusive, Line 22			117
29.	Mixed, Line 26			38
30.	Total Michigan Special Passenger			155
31.	System Regular Passenger, Line 6		100.00	103,309
32.	Divided relatively with the total mileage of Regular D.S.S.& A Passenger train locomotives in and outside of Michigan	980,920		
33.	Outside Michigan	163,070	16.62	17,170
34.	Michigan (including Mineral Range)	817,850	83.38	86,139
35.	Michigan Regular Passenger, Line 34		100.00	86,139
36.	Divided relatively with the Michigan mileage of Regular D.S.S.&A. Passenger train locomotives on Mineral Range and D.S.S.& A.	817,850		
37.	Mineral Range	43,182	5.28	4,548
38.	D. S. S. & A.	774,668	94.72	81,591
39.	Michigan Freight Recap.:			
40.	Regular, Line 10			163,177
41.	Mixed, Line 13			1,332
42.	Special, Line 25			199
43.	Total Michigan Freight			164,708

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 394—Fuel for Train Locomotives (Continued).

		%	$
44.	Michigan Passenger Recap.:		
45.	Mixed, Line 14		252
46.	Special, Line 30		155
47.	Regular, Line 38		81,591
48.	Total Michigan Passenger		81,998
49.	Michigan Passenger, Line 48	100.00	81,998
50.	Divided on Michigan Passenger Gross Ton miles, Ratio No. 1b.		
51.	Sleepers and Diners	40.20	32,963
52.	Mail and Express	14.63	11,996
53.	Passengers and Baggage	45.17	37,039
54.	Michigan Passengers and Baggage, Line 53	100.00	37,039
55.	Divided on Michigan Passenger miles, Ratio No. 10		
56.	Interstate	29.19	10,812
57.	Intrastate	70.81	26,227

No. 397—Water for Train Locomotives.
No. 398—Lubricants for Train Locomotives.

			No. 397	No. 398
		%	$	$
1. System Totals, per Annual Report		100.00	14,354	5,615
2. Divided to Services relatively with Account No. 394	$301,342			
3. Regular Freight	196,008	65.04	9,336	3,652
4. Mixed (all Michigan)	1,584	.53	76	30
5. Special	441	.15	22	8
6. Regular Passenger	103,309	34.28	4,920	1,925
7. System Regular Freight, Line 3		100.00	9,336	3,652
8. Divided relatively with Account No. 394	$196,008			
9. Outside Michigan	32,831	16.75	1,564	612
10. Michigan	163,177	83.25	7,772	3,040
11. Michigan Mixed, Line 4		100.00	76	30
12. Divided relatively with Account No. 394.				
13. Freight		84.09	64	25
14. Passenger		15.91	12	5
15. System Special, Line 5		100.00	22	8
16. Divided relatively with Account No. 394.				
17. Outside Michigan		19.78	4	2
18. Michigan		80.22	18	6
19. Michigan Special, Line 18		100.00	18	6
20. Divided relatively with Account No. 394.				
21. Mixed		67.02	12	4
22. Passenger		32.98	6	2

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 397—Water for Train Locomotives.
No. 398—Lubricants for Train Locomotives.
(Continued)

		%	No. 397 $	No. 398 $
23.	Michigan Special Mixed, Line 21	100.00	12	4
24.	Divided relatively with Account No. 394.			
25.	Freight	84.09	10	3
26.	Passenger	15.91	2	1
27.	Michigan Special Passenger Recap.:			
28.	Exclusive, Line 22		6	2
29.	Mixed, Line 26		2	1
30.	Total Michigan Special Passenger		8	3
31.	System Regular Passenger, Line 6	100.00	4,920	1,925
32.	Divided relatively with Account No. 394.			
33.	Outside Michigan	16.62	818	320
34.	Michigan	83.38	4,102	1,605
35.	Michigan Regular Passenger, Line 34	100.00	4,102	1,605
36.	Divided relatively with Account No. 394.			
37.	Mineral Range	5.28	217	85
38.	D. S. S. & A.	94.72	3,885	1,520
39.	Michigan Freight Recap.:			
40.	Regular, Line 10		7,772	3,040
41.	Mixed, Line 13		64	25
42.	Special, Line 25		10	3
43.	Total Michigan Freight		7,846	3,068
44.	Michigan Passenger Recap.:			
45.	Mixed, Line 14		12	5
46.	Special, Line 30		8	3
47.	Regular, Line 38		3,885	1,520
48.	Total Michigan Passenger		3,905	1,528

No. 397—Water for Train Locomotives.
No. 398—Lubricants for Train Locomotives.
(Continued)

		%	No. 397 $	No. 398 $
49.	Michigan Passenger, Line 48	100.00	3,905	1,528
50.	Divided on Michigan Passenger Gross Ton miles, Ratio No. 1b.			
51.	Sleepers and Diners	40.20	1,570	614
52.	Mail and Express	14.63	571	224
53.	Passengers and Baggage	45.17	1,764	690
54.	Michigan Passengers and Baggage, Line 53	100.00	1,764	690
55.	Divided on Michigan Passenger miles, Ratio No. 10.			
56.	Interstate	29.19	515	201
57.	Intrastate	70.81	1,249	489

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 399—Other Supplies for Train Locomotives.

			%	$
1.	System Total, per Annual Report			2,667
2.	Divided to Services (Hillman data)			
3.	Mineral Range Passenger (all Michigan)			28
4.	Regular Freight			1,725
5.	Mixed (all Michigan)			20
6.	Special			5
7.	Regular Passenger			889
8.	System Regular Freight, Line 4		100.00	1,725
9.	Divided relatively with the Total Mileage of Regular Freight Train Locomotives in and outside of Michigan	1,117,069		
10.	Outside Michigan	187,054	16.75	289
11.	Michigan	930,015	83.25	1,436
12.	Michigan Mixed, Line 5		100.00	20
13.	Divided relatively with the number of Freight and Passenger Cars in Mixed Trains			
14.	Freight		84.09	17
15.	Passenger		15.91	3
16.	System Special, Line 6		100.00	5
17.	Divided relatively with the total mileage of Special Train Locomotives in and outside of Michigan	2,593		
18.	Outside Michigan	513	19.78	1
19.	Michigan	2,080	80.22	4
20.	Michigan Special, Line 19		100.00	4
21.	Divided relatively with the Michigan mileage of Special Train Locomotives in Mixed and Passenger Services	2,080		
22.	Mixed	1,394	67.02	3
23.	Passenger	686	32.98	1

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 399—Other Supplies for Train Locomotives (Continued).

			%	$
24.	Michigan Special Mixed, Line 22		100.00	3
25.	Divided relatively with the number of Freight and Passenger Cars in Mixed Trains.			
26.	Freight		84.09	3
27.	Passenger		15.91	0
28.	System Regular Passenger, Line 7		100.00	889
29.	Divided relatively with the total Mileage of Regular D.S.S.&A. Passenger Train Locomotives in and outside of Michigan	937,738		
30.	Outside Michigan	163,070	17.39	155
31.	Michigan	774,668	82.61	734
32.	Michigan Freight recap.:			
33.	Regular, Line 11			1,436
34.	Mixed, Line 14			17
35.	Special, Line 26			3
36.	Total Michigan Freight			1,456
37.	Michigan Passenger Recap.:			
38.	Mixed, Line 15			3
39.	Special, Line 23			1
40.	Regular, Line 31			734
41.	Total Michigan Passenger			738
42.	Michigan Passenger, Line 41		100.00	738
43.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1b.			
44.	Sleepers and Diners		40.20	297
45.	Mail and Express		14.63	108
46.	Passengers and Baggage		45.17	333
47.	Michigan Passengers and Baggage, Line 46		100.00	333
48.	Divided on Michigan Passenger Miles, Ratio No. 10			
49.	Interstate		29.19	97
50.	Intrastate		70.81	236

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 400—Enginehouse Expenses—Train.

		%	$
1.	System Total, per Annual Report, $45,259; assigned to Michigan by Delf		39,329
2.	Assigned to Services by Delf		
3.	Freight		22,930
4.	Passenger		16,399
5.	Michigan Passenger, Line 4	100.00	16,399
6.	Divided on Michigan Passenger Gross ton miles, Ratio No. 1b.		
7.	Sleepers and Diners	40.20	6,592
8.	Mail and Express	14.63	2,399
9.	Passengers and Baggage	45.17	7,408
10.	Michigan Passengers and Baggage, Line 9	100.00	7,408
11.	Divided on Michigan Passenger miles, Ratio No. 10		
12.	Interstate	29.19	2,162
13.	Intrastate	70.81	5,246

NOTE—Located to Enginehouse by Delf; 14.8% of Michigamme and 50% of Thomaston assigned to Outside Michigan. Each Enginehouse assigned to Services on the basis of locomotives handled in each Service in each Roundhouse.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 401—Trainmen.

			%	$
1.	System Total, per Annual Report			201,769
2.	Assigned to Services by Delf			
3.	Freight			138,643
4.	Passenger			63,126
5.	System Freight, Line 3		100.00	138,643
6.	Divided relatively with the Total Mileage of Freight trains (including proportion of Mixed and Special) plus train switching in and outside of Michigan	1,071,810		
7.	Outside Michigan	183,423	17.11	23,722
8.	Michigan	888,387	82.89	114,921
9.	System Passenger, Line 4		100.00	63,126
10.	Divided relatively with the Total Mileage of D.S.S.&A. Passenger trains (including proportion of Mixed and Special) plus train switching in and outside of Michigan and on Mineral Range and D.S.S.&A.	956,764		
11.	Outside Michigan	159,821	16.71	10,548
12.	Michigan—Mineral Range	43,182(a)	4.51	2,847
13.	Michigan—D.S.S.&A.	753,761	78.78	49,731
14.	Michigan D.S.S.&A. Passenger, Line 13		100.00	49,731
15.	Divided on Passenger Trainmen's Pay Roll, Ratio No. 17a.			
16.	Conductors		52.98	26,348
17.	Brakemen		29.21	14,526
18.	Baggagemen (all Passengers and Baggage)		17.81	8,857
19.	Michigan Passenger Train Conductors, Line 16			26,348
20.	50% to Passengers and Baggage			13,174
21.	50% to Common Train Operation			13,174

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 401—Trainmen (Continued).

		%	$
22.	Michigan Common Passenger Train Operation Recap.:		
23.	Brakemen, Line 17		14,526
24.	50% Conductors, Line 21		13,174
25.	Total Michigan Common Passgr. train operation		27,700
26.	Michigan Common Passgr. Train Operation, Line 25	100.00	27,700
27.	Divided on Michigan D.S.S.&A. Passenger Train car miles, Ratio No. 3a.		
28.	Sleepers and Diners	30.21	8,368
29.	Mail and Express	15.20	4,210
30.	Passengers and Baggage	54.59	15,122
31.	Michigan Passengers and Baggage Recap.:		
32.	Baggagemen, Line 18		8,857
33.	50% Conductors, Line 20		13,174
34.	Common, Line 30		15,122
35.	Total Michigan Passengers and Baggage		37,153
36.	Michigan Passengers and Baggage, Line 35	100.00	37,153
37.	Divided on Michigan Passenger miles, Ratio No. 10		
38.	Interstate	29.19	10,845
39.	Intrastate	70.81	26,308

NOTE—(a) Mileage of D.S.S.&A. Locomotives taken as train miles.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 402—Train Supplies and Expenses.

			%	$
1.	System Total, per Annual Report			34,399
2.	Assigned to Services by Delf			
3.	Freight			7,790
4.	Passenger			26,609
5.	System Freight, Line 3		100.00	7,790
6.	Divided relatively with the Total Mileage of Freight trains (including proportion of Mixed and Special) plus train switching in and outside of Michigan	1,071,810		
7.	Outside Michigan	183,423	17.11	1,333
8.	Michigan	888,387	82.89	6,457
9.	System Passenger, Line 4		100.00	26,609
10.	Divided relatively with the total mileage of D.S.S.&A. Passenger trains (including proportion of Mixed and Special) plus train switching in and outside of Michigan and on Mineral Range and D.S.S.&A.	956,764		
11.	Outside Michigan	159,821	16.71	4,446
12.	Michigan—Mineral Range	43,182	(a) 4.51	1,200
13.	Michigan—D.S.S.&A.	753,761	78.78	20,963
14.	Michigan D.S.S.&A. Passenger, Line 13		100.00	20,963
15.	Divided on Michigan D.S.S.&A. Passenger train car miles, Ratio No. 3a.			
16.	Sleepers and Diners		30.21	6,333
17.	Mail and Express		15.20	3,186
18.	Passengers and Baggage		54.59	11,444
19.	Michigan Passengers and Baggage, Line 18		100.00	11,444
20.	Divided on Michigan Passenger miles, Ratio No. 10			
21.	Interstate		29.19	3,341
22.	Intrastate		70.81	8,103

NOTE—(a) Locomotive miles D.S.S.&A. locomotives taken as train miles.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 403—Operating Sleeping Cars:

	$
1. System Total, per Annual Report, $13,954; allocated to Michigan by Delf.	10,566
All Sleepers and Diners.	

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 404—Signal and Interlocker Operation.

		%	$
1.	System Total, per Annual Report, $1,540; allocated to Michigan by Delf	100.00	311
2.	Divided as per data on page following Account No. 405		
3.	Freight	94.76	295
4.	Passenger	5.24	16
5.	Michigan Passenger, Line 4	100.00	16
6.	Divided on Michigan Total Passenger train car miles, Ratio No. 3.		
7.	Sleepers and Diners	29.48	5
8.	Mail and Express	14.80	2
9.	Passengers and Baggage	55.72	9
10.	Michigan Passengers and Baggage, Line 9	100.00	9
11.	Divided on Michigan Passenger miles, Ratio No. 10.		
12.	Interstate	29.19	3
13.	Intrastate	70.81	6

NOTE—Of the Michigan portion of this charge, $31.34 is for Fuel, probably for Negaunee Semaphore.

The balance of $280 is for Negaunee Semaphore operators for the months of January, February, March and April at $70 per month. The balance of the year, this is charged to "crossing protection," and in 1914 and 1915 it was charged entirely to that account.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 405—Crossing Protection.

		%	$
1.	System Totals per Annual Report, $8,639; allocated to Michigan by Delf	100.00	8,159
2.	Divided as per data on following page.		
3.	Freight	94.76	7,731
4.	Passenger	5.24	428
5.	Michigan Passenger, Line 4	100.00	428
6.	Divided on Michigan Total Passenger train car-miles, Ratio No. 3.		
7.	Sleepers and Diners	29.48	126
8.	Mail and Express	14.80	63
9.	Passengers and Baggage	55.72	239
10.	Michigan Passengers and Baggage, Line 9	100.00	239
11.	Divided on Michigan Passenger miles, Ratio No. 10.		
12.	Interstate	29.19	70
13.	Intrastate	70.81	169

NOTE—The Michigan portion of the Charges is made up of the following:

Marquette	$4,819.34
St. Ignace	440.00
Ishpeming	1,329.30
Negaunee Semaphore	560.00
Negaunee Crossing	932.85
Fuel	38.91
Various	39.07
Total	$8,159.47

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Data for Dividing Accounts Nos. 404 and 405.

Data is based on the following:

(a) An examination of the Despatcher's Daily Train Register for one week in July, 1915, and one week in January, 1916, from which we were able to ascertain the number of trains, class of service and approximate amount of time spent by each in the protected areas at Negaunee and Ishpeming, and the number and class of service of trains, entering and leaving Marquette and St. Ignace.

(b) The estimating of amounts of time for train and train locomotive movements, at Marquette and St. Ignace, for trains for which no other approximation of time could be had, as follows:

		Minutes
St. Ignace:	Passenger Trains East and West Bound in Yard Limits	2
	Passenger Locomotives to or from Roundhouse	2
	Freight Trains Departing	4
	Freight Locomotives to or from Roundhouse	2
Marquette:	Passenger Trains East or West Bound to and from Yard Limits	5
	Passenger Locomotives to or from Roundhouse	5
	Freight Trains East or West Bound Departures	5
	Freight Trains West Bound Arrivals	10
	Freight Trains East Bound Arrivals	20
	Freight Locomotives to or from Roundhouse	10
	Ore Trains, in or out	5
	Ore Trains Locomotives, all movements	10
Yard Switching to all points per statistical mile		10

	Minutes	%
Results, Passenger Time	5,481	5.24
Freight Time	99,054	94.76
Total	104,535	100.00

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 407—Telegraph and Telephone Operation.

			%	$
1.	System Total, per Annual Report		100.00	174
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 372 to 420 inclusive, except 407 and 410 (see detail page following Account No. 371)	$1,190,363		
3.	Outside Michigan	175,076	14.71	26
4.	Michigan	1,015,287	85.29	148
5.	Michigan Total, Line 4		100.00	148
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$ 994,162		
7.	Freight	714,446	71.86	105
8.	Passenger	279,716	28.14	43
9.	Michigan Passenger, Line 8		100.00	43
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$ 279,716		
11.	Sleepers and Diners	94,716	33.86	15
12.	Mail and Express	34,667	12.39	5
13.	Passengers and Baggage	150,333	53.75	23
14.	Michigan Passengers and Baggage, Line 13		100.00	23
15.	Divided on Michigan Passenger Miles, Ratio No. 10.			
16.	Interstate		29.19	7
17.	Intrastate		70.81	16

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 410—Stationery and Printing.

			%	$
1.	System Total, per Annual Report		100.00	12,105
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 372 to 420 inclusive, except 407 and 410 (see detail page following Account No. 371)	$1,190,363		
3.	Outside Michigan	175,076	14.71	1,781
4.	Michigan	1,015,287	85.29	10,324
5.	Michigan Total, Line 4		100.00	10,324
6.	Divided relatively with Delf's 1917 allocation of this account to System Services.			
7.	Freight		46.83	4,835
8.	Common Freight and Passenger		29.84	3,081
9.	Passenger		23.33	2,408
10.	Michigan Common, Line 8		100.00	3,081
11.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$ 994,162		
12.	Freight	714,446	71.86	2,214
13.	Passenger	279,716	28.14	867
14.	Michigan Freight Recap:			
15.	Exclusive, Line 7			4,835
16.	Common, Line 12			2,214
17.	Total Michigan Freight			7,049
18.	Michigan Passenger Recap:			
19.	Exclusive, Line 9			2,408
20.	Common, Line 13			867
21.	Total Michigan Passenger			3,275

No. 410—Stationery and Printing (Continued).

			%	$
22.	Michigan Passenger, Line 21		100.00	3,275
23.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$ 279,716		
24.	Sleepers and Diners	94,716	33.86	1,109
25.	Mail and Express	34,667	12.39	406
26.	Passengers and Baggage	150,333	53.75	1,760
27.	Michigan Passengers and Baggage, Line 26		100.00	1,760
28.	Divided on Michigan Passenger Miles, Ratio No. 10.			
29.	Interstate		29.19	514
30.	Intrastate		70.81	1,246

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 411—Other Expenses.

			%	$
1.	System Total, per Annual Report, $1,214; allocated to Michigan by Delf.			997
2.	Allocated to Services by Delf.			
3.	Freight			787
4.	Common Freight and Passenger			194
5.	Passenger			16
6.	Michigan Common, Line 4		100.00	194
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$994,162		
8.	Freight	714,446	71.86	139
9.	Passenger	279,716	28.14	55
10.	Michigan Freight Recap:			
11.	Exclusive, Line 3			787
12.	Common, Line 8			139
13.	Total Michigan Freight			926
14.	Michigan Passenger Recap:			
15.	Exclusive, Line 5			16
16.	Common, Line 9			55
17.	Total Michigan Passenger			71
18.	Michigan Passenger, Line 17		100.00	71
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$279,716		
20.	Sleepers and Diners	94,716	33.86	24
21.	Mail and Express	34,667	12.39	9
22.	Passengers and Baggage	150,333	53.75	38
23.	Michigan Passengers and Baggage, Line 22		100.00	38
24.	Divided on Michigan Passenger Miles, Ratio No. 10.			
25.	Interstate		29.19	11
26.	Intrastate		70.81	27

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 412—Operating Joint Tracks and Facilities—Dr.

			%	$
1.	System Total, per Annual Report, $4,502; allocated to Michigan		100.00	1,083
2.	Allocated to Services.			
3.	Freight			939
4.	Common Freight and Passenger			68
5.	Passenger (Soo Bridge)			76
6.	Michigan Common, Line 4		100.00	68
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$994,162		
8.	Freight	714,446	71.86	49
9.	Passenger	279,716	28.14	19
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			939
12.	Common, Line 8			49
13.	Total Michigan Freight			988
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			76
16.	Common, Line 9			19
17.	Total Michigan Passenger			95
18.	Michigan Passenger, Line 17			95
19.	Allocated to Interstate Passengers and Baggage, account of Soo Bridge			76
20.	Balance			19

No. 412—Operating Joint Tracks and Facilities—Dr. (Continued).

			%	$
21.	Michigan Passenger, other than Soo Bridge, Line 20		100.00	19
22.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$279,716		
23.	Sleepers and Diners	94,716	33.86	7
24.	Mail and Express	34,667	12.39	2
25.	Passengers and Baggage	150,333	53.75	10
26.	Michigan Passengers and Baggage, other than Soo Bridge, Line 25		100.00	10
27.	Divided on Michigan Passenger Miles, Ratio No. 10.			
28.	Interstate		29.19	3
29.	Intrastate		70.81	7
30.	Michigan Interstate Passengers and Baggage Recap.:			
31.	Soo Bridge, Line 19			76
32.	Others, Line 28			3
33.	Total Michigan Interstate Passengers and Baggage			79

Note.—The Michigan Common portion of this charge is made up of the following:

Station Supplies, etc., Sidnaw	$64.52
Gates, Ishpeming	3.51
Total Michigan Common	$68.03

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 413—Operating Joint Tracks and Facilities.—Cr.

			%	$
1.	System Total, per Annual Report, $4,928*; allocated to Michigan			*3,478
2.	Allocated to Services.			
3.	Freight			*2,078
4.	Common Freight and Passenger			* 645
5.	Passenger			* 755
6.	Michigan Common, Line 4		100.00	* 645
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$994,162		
8.	Freight	714,446	71.86	* 463
9.	Passenger	279,716	28.14	* 182
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			*2,078
12.	Common, Line 8			* 463
13.	Total Michigan Freight			*2,541
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			* 755
16.	Common, Line 9			* 182
17.	Total Michigan Passenger			* 937
18.	Michigan Passenger, Line 17		100.00	* 937
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$279,716		
20.	Sleepers and Diners	94,716	33.86	* 317
21.	Mail and Express	34,667	12.39	* 116
22.	Passengers and Baggage	150,333	53.75	* 504

*Typewritten figures in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 413—Operating Joint Tracks and Facilities—Cr. (Continued).

		%	$
23.	Michigan Passengers and Baggage, Line 22	100.00	* 504
24.	Divided on Michigan Passenger Miles, Ratio No. 10.		
25.	Interstate	29.19	* 147
26.	Intrastate	70.81	* 357

Note.—The Michigan Common portion of this charge is made up of the following:

Water Tanks	$183.45
Various Joint Stations	461.83
Total Michigan Common	$645.28

*Typewritten in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 414—Insurance.

			%	$
1.	System Total, per Annual Report, $1,827; allocated to Michigan by Delf			1,443
2.	Allocated to Services by Delf.			
3.	Freight			834
4.	Common Freight and Passenger			542
5.	Passenger			67
6.	Michigan Common, Line 4		100.00	542
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$994,162		
8.	Freight	714,446	71.86	389
9.	Passenger	279,716	28.14	153
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			834
12.	Common, Line 8			389
13.	Total Michigan Freight			1,223
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			67
16.	Common, Line 9			153
17.	Total Michigan Passenger			220

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 414—Insurance (Continued).

			%	$
18.	Michigan Passenger, Line 17		100.00	220
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$279,716		
20.	Sleepers and Diners	94,716	33.86	75
21.	Mail and Express	34,667	12.39	27
22.	Passengers and Baggage	150,333	53.75	118
23.	Michigan Passengers and Baggage, Line 22		100.00	118
24.	Divided on Michigan Passenger Miles, Ratio No. 10			
25.	Interstate		29.19	34
26.	Intrastate		70.81	84

NOTE—Delf divides the Michigan Common portion of this charge as follows:

Bonds on Agents	$52.00
Contents of Freight and Passenger Depots	44.00
Coal	418.80
Contents of Miscellaneous Bldgs	27.50
Total	$542.30

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 415—Clearing Wrecks.

			%	$
1.	System Total, per Annual Report, $1,151; allocated to Michigan by Delf			1,065
2.	Allocated to Services by Delf.			
3.	Freight			795
4.	Passenger			270
5.	Michigan Passenger, Line 4		100.00	270
6.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$279,716		
7.	Sleepers and Diners	94,716	33.86	91
8.	Mail and Express	34,667	12.39	34
9.	Passengers and Baggage	150,333	53.75	145
10.	Michigan Passengers and Baggage, Line 9		100.00	145
11.	Divided on Michigan Passenger miles, Ratio No. 10			
12.	Interstate		29.19	42
13.	Intrastate		70.81	103

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 416—Damage to Property.

			%	$
1.	System Total, per Annual Report, $599; allocated to Michigan by Delf			594
2.	Allocated to Services by Delf.			
3.	Freight			382
4.	Common Freight and Passenger			212
5.	Michigan Common, Line 4		100.00	212
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$994,162		
7.	Freight	714,446	71.86	152
8.	Passenger	279,716	28.14	60
9.	Michigan Freight Recap.:			
10.	Exclusive, Line 3			382
11.	Common, Line 7			152
12.	Total Michigan Freight			534
13.	Michigan Passenger, Line 8		100.00	60
14.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$279,716		
15.	Sleepers and Diners	94,716	33.36	20
16.	Mail and Express	34,667	12.39	8
17.	Passengers and Baggage	150,333	53.75	32
18.	Michigan Passengers and Baggage, Line 17		100.00	32
19.	Divided on Michigan Passenger Miles, Ratio No. 10			
20.	Interstate		29.19	9
21.	Intrastate		70.81	23

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 417—Damage to Stock on Right-of-Way.

			%	$
1.	System Total, per Annual Report, $422; allocated to Michigan by Delf			400
2.	Allocated to Services by Delf.			
3.	Freight			75
4.	Common Freight and Passenger			3
5.	Passenger			322
6.	Michigan Common, Line 4		100.00	3
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$994,162		
8.	Freight	714,446	71.86	2
9.	Passenger	279,716	28.14	1
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			75
12.	Common, Line 8			2
13.	Total Michigan Freight			77
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line Line 5			322
16.	Common, Line 9			1
17.	Total Michigan Passenger			323
18.	Michigan Passenger, Line 17		100.00	323
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$279,716		
20.	Sleepers and Diners	94,716	33.86	109
21.	Mail and Express	34,667	12.39	40
22.	Passengers and Baggage	150,333	53.75	174
23.	Michigan Passenger and Baggage, Line 22		100.00	174
24.	Divided on Michigan Passenger Miles, Ratio No. 10			
25.	Interstate		29.19	51
26.	Intrastate		70.81	123

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 418—Loss and Damage—Freight.

	%	$
1. System Total, per Annual Report, $6,971; allocated to Michigan by Delf		5,773
All Freight.		

No. 419—Loss and Damage—Baggage.

	%	$
1. System Total, per Annual Report $155; allocated to Michigan by Delf. (All Passengers and Baggage)		138
2. Michigan Passengers and Baggage, Line 1	100.00	138
3. Divided on Michigan Passenger miles, Ratio No. 10.		
4. Interstate	29.19	40
5. Intrastate	70.81	98

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 420—Injuries to Persons.

			%	$
1.	System Total, per Annual Report, $10,618; allocated to Michigan by Delf			6,916
2.	Allocated to Services by Delf			
3.	Freight			4,404
4.	Common Freight and Passenger			938
5.	Passenger			1,574
6.	Michigan Common, Line 4		100.00	938
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$994,162		
8.	Freight	714,446	71.86	674
9.	Passenger	279,716	28.14	264
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			4,404
12.	Common, Line 8			674
13.	Total Michigan Freight			5,078
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			1,574
16.	Common, Line 9			264
17.	Total Michigan Passenger			1,838
18.	Michigan Passenger, Line 17		100,00	1,838
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$279,716		
20.	Sleepers and Diners	94,716	33.86	622
21.	Mail and Express	34,667	12.39	228
22.	Passengers and Baggage	150,333	53.75	988
23.	Michigan Passengers and Baggage, Line 22		100.00	988
24.	Divided on Michigan Passenger Miles, Ratio No. 10			
25.	Interstate		29.19	288
26.	Intrastate		70.81	700

VI. Miscellaneous Operations.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

VI. MISCELLANEOUS OPERATIONS.

No. 441—Dining and Buffet Service.

	$
1. System Total, per Annual Report, $43,984; allocated to Michigan by Delf	35,899

All Sleepers and Diners.

VII. General.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

VII. GENERAL.

No. 451—Salaries and Expenses of General Officers.

			%	$
1.	System Total, per Annual Report		100.00	25,342
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following)	$2,352,443		
3.	Outside Michigan	368,284	15.66	3,969
4.	Michigan	1,984,159	84.34	21,373
5.	Michigan Total, Line 4		100.00	21,373
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following)	$1,984,159		
7.	Freight	1,437,118	72.43	15,480
8.	Passenger	547,041	27.57	5,893
9.	Michigan Passenger, Line 8		100.00	5,893
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following)	$ 547,041		
11.	Sleepers and Diners	196,689	35.96	2,119
12.	Mail and Express	65,282	11.93	703
13.	Passengers and Baggage	285,070	52.11	3,071
14.	Michigan Passengers and Baggage, Line 13		100.00	3,071
15.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following)	$ 285,070		
16.	Interstate	93,703	32.87	1,009
17.	Intrastate	191,367	67.13	2,062

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Details for dividing Accounts Nos. 451, 452, 453, 454, 455, 457, 458, 459, 460 and 461.

Acct.	System Total, excluding Mineral Range	Outside Michigan	MICHIGAN, excluding Mineral Range							
			Total	Freight	PASSENGER					
					Total	Sleepers & Diners	Mail & Express	Passengers and Baggage		
								Total	Inter-state	Intra-state
			$	$	$	$	$	$	$	$
I.	582,104	100,311	481,793	383,106	98,687	34,970	14,284	49,433	14,615	34,818
II.	426,217	64,964	361,253	272,699	88,554	27,880	15,127	45,547	13,294	32,253
III.	89,012	15,004	74,008	39,494	34,514			34,514	20,328	14,186
IV.	1,211,126	179,920	1,031,206	741,819	289,387	97,940	35,871	155,576	45,466	110,110
VI.	43,984	8,085	35,899		35,899	35,899				
Total	2,352,443	368,284	1,984,159	1,437,118	547,041	196,689	65,282	285,070	93,703	191,367

THIS PAGE BOUND VERTICAL IN BOOK

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 452—Salaries and Expenses of Clerks and Attendants.

			%	$
1.	System Total, per Annual Report		100.00	37,898
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,352,443		
3.	Outside Michigan	368,284	15.66	5.935
4.	Michigan	1,984,159	84.34	31,963
5.	Michigan Total, Line 4		100.00	31,963
6.	Divided relatively with Delf's allocation to System Services in this account	$ 37,898		
7.	Freight	12,081	31.88	10,190
8.	Common Freight and Passenger	19,175	50.60	16,173
9.	Passenger	6,642	17.52	5,600
10.	Michigan Common, Line 8		100.00	16,173
11.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$1,984,159		
12.	Freight	1,437,118	72.43	11,714
13.	Passenger	547,041	27.57	4,459
14.	Michigan Freight Recap.:			
15.	Exclusive, Line 7			10,190
16.	Common, Line 12			11,714
17.	Total Michigan Freight			21,904

No. 452, Salaries and Expenses of Clerks and Attendants —Continued.

			%	$
18.	Michigan Passenger Recap.:			
19.	Exclusive, Line 9			5,600
20.	Common, Line 13			4,459
21	Total Michigan Passenger			10,059
22.	Michigan Passenger, Line 21		100.00	10,059
23.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 547,041		
24.	Sleepers and Diners	196,689	35.96	3,617
25.	Mail and Express	65,282	11.93	1,200
26.	Passengers and Baggage	285,070	52.11	5,242
27.	Michigan Passengers and Baggage, Line 26		100.00	5,242
28.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$285,070		
29.	Interstate	93,703	32.87	1,723
30.	Intrastate	191,367	67.13	3,519

No. 453—General Office Supplies and Expenses.

			%	$
1.	System Total, per Annual Report			4,070
2.	Assigned to States by Delf.			
3.	Outside Michigan (all Freight)			23
4.	Common Michigan and Outside Michigan			3,934
5.	Michigan (all Freight)			113
6.	Common Michigan and Outside Michigan, Line 4		100.00	3,934
7.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,352,443		
8.	Outside Michigan	368,284	15.66	616
9.	Michigan	1,984,159	84.34	3,318
10.	Michigan Common, Line 9		100.00	3,318
11.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$1,984,159		
12.	Freight	1,437,118	72.43	2,403
13.	Passenger	547,041	27.57	915

No. 453, General Office Supplies and Expenses—Continued.

			%	$
14.	Michigan Freight Recap.:			
15.	Exclusive, Line 5			113
16.	Common, Line 12			2,403
17.	Total Michigan Freight			2,516
18.	Michigan Passenger, Line 13		100.00	915
19.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 547,041		
20.	Sleepers and Diners	196,689	35.96	329
21.	Mail and Express	65,282	11.93	109
22.	Passengers and Baggage	285,070	52.11	477
23.	Michigan Passengers and Baggage, Line 22		100.00	477
24.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 285,070		
25.	Interstate	93,703	32.87	15
26.	Intrastate	191,367	67.13	32

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 454—Law Expenses.

			%	$
1.	System Total, per Annual Report			19,906
2.	Less cost of this Suit			9,676
3.	Balance			10,230
4.	System Total, other than cost of Suit, Line 3			10,230
5.	Assigned to States by Delf.			
6.	Outside Michigan			58
7.	Common Michigan and Outside Michigan			8,856
8.	Michigan			1,316
9.	Common Michigan and Outside Michigan, Line 7		100.00	8,856
10.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,352,443		
11.	Outside Michigan	368,284	15.66	1,387
12.	Michigan	1,984,159	84.34	7,469
13.	Exclusive Michigan, Line 8			1,316
14.	Allocated to Services by Delf.			
15.	Freight			210
16.	Common Freight and Passenger			189
17.	Passenger			917
18.	Michigan Common Recap:			
19.	Common Michigan and Outside Michigan, Line 12			7,469
20.	Exclusive Michigan, Line 16			189
21.	Total Michigan Common			7,658
22.	Michigan Common, Line 21		100.00	7,658
23.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$1,984,159		
24.	Freight	1,437,118	72.43	5,547
25.	Passenger	547,041	27.57	2,111

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 454—Law Expenses (Continued).

			%	$
26.	Michigan Freight Recap:			
27.	Exclusive, Line 15			210
28.	Common, Line 24			5,547
29.	Total Michigan Freight			5,757
30.	Michigan Passenger Recap:			
31.	Exclusive, Line 17			917
32.	Common, Line 25			2,111
33.	Total Michigan Passenger			3,028
34.	Michigan Passenger, Line 33			3,028
35.	Allocated to Mail and Express, account of DSS&A proportion of Expenses of Washington Law Firm (Note)			231
36.	Balance			2,797
37.	Michigan Passenger, other than Expenses of Washington Law Firm		100.00	2,797
38.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$547,041		
39.	Sleepers and Diners	196,689	35.96	1,006
40.	Mail and Express	65,282	11.93	334
41.	Passengers and Baggage	285,070	52.11	1,457
42.	Michigan Mail and Express Recap:			
43.	Expenses of Washington Law Firm, Line 35			231
44.	Other, Line 40			334
45	Total Michigan Mail and Express			565
46.	Michigan Passengers and Baggage, Line 41		100.00	1,457
47.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$285,070		
48.	Interstate	93,703	32.87	479
49.	Intrastate	191,367	67.13	978

NOTE—This charge is the Michigan portion of a total $280.00 incurred on account of Railway Mail Service.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 455—Insurance.

			%	$
1.	System Total, per Annual Report		100.00	143
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,352,443		
3.	Outside Michigan	368,284	15.66	22
4.	Michigan	1,984,159	84.34	121
5.	Michigan Total, Line 4		100.00	121
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$1,984,159		
7.	Freight	1,437,118	72.43	88
8.	Passenger	547,041	27.57	33
9.	Michigan Passenger, Line 8		100.00	33
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 547,041		
11.	Sleepers and Diners	196,689	35.96	12
12.	Mail and Express	65,282	11.93	4
13.	Passengers and Baggage	285,070	52.11	17
14.	Michigan Passengers and Baggage, Line 13		100.00	17
15.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 285,070		
16.	Interstate	93,703	32.87	6
17.	Intrastate	191,367	67.13	11

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 457—Pensions.

			%	$
1.	System Total, per Annual Report		100.00	4,020
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,352,443		
3.	Outside Michigan	368,284	15.66	630
4.	Michigan	1,984,159	84.34	3,390
5.	Michigan Total, Line 4		100.00	3,390
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$1,984,159		
7.	Freight	1,437,118	72.43	2,455
8.	Passenger	547,041	27.57	935
9.	Michigan Passenger, Line 8		100.00	935
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 547,041		
11.	Sleepers and Diners	196,689	35.96	336
12.	Mail and Express	65,282	11.93	112
13.	Passengers and Baggage	285,070	52.11	487
14.	Michigan Passengers and Baggage, Line 13		100.00	487
15.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 285,070		
16.	Interstate	93,703	32.87	160
17.	Intrastate	191,367	67.13	327

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 458—Stationery and Printing.

			%	$
1.	System Total, per Annual Report		100.00	5,005
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,352,443		
3.	Outside Michigan	368,284	15.66	784
4.	Michigan	1,984,159	84.34	4,221
5.	Michigan Total, Line 4		100.00	4,221
6.	Divided relatively with Delf's allocated to System Services in this account	$ 5,005		
7.	Freight	390	7.79	329
5.	Common Freight and Passenger	4,475	89.41	3,774
9.	Passenger	140	2.80	118
10.	Michigan Common, Line 8		100.00	3,774
11.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$1,984,159		
12.	Freight	1,437,118	72.43	2,734
13.	Passenger	547,041	27.57	1,040
14.	Michigan Freight Recap.:			
15.	Exclusive, Line 7			329
16.	Common, Line 12			2,734
17.	Total Michigan Freight			3,063

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 458, Stationery and Printing (Continued).

			%	$
18.	Michigan Passenger Recap.:			
19.	Exclusive, Line 9			118
20.	Common, Line 13			1,040
21.	Total Michigan Passenger			1,158
22.	Michigan Passenger, Line 21		100.00	1,158
23.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$547,041		
24.	Sleepers and Diners	196,689	35.96	416
25.	Mail and Express	65,282	11.93	138
26.	Passengers and Baggage	285,070	52.11	604
27.	Michigan Passengers and Baggage, Line 26		100.00	604
28.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$285,070		
29.	Interstate	93,703	32.87	199
30.	Intrastate	191,367	67.13	405

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 459—Valuation Expenses.

			%	$
1.	System Total, per Annual Report		100.00	12,034
2.	Divided relatively with the total mileage of all D.S.S.&A. Tracks in and outside of Michigan	777.98		
3.	Outside Michigan	130.87	16.82	2,024
4.	Michigan	647.11	83.18	10,010
5.	Michigan Total, Line 4		100.00	10,010
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$1,984,159		
7.	Freight	1,437,118	72.43	7,250
8.	Passenger	547,041	27.57	2,760
9.	Michigan Passenger, Line 8		100.00	2,760
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 547,041		
11.	Sleepers and Diners	196,689	35.96	993
12.	Mail and Express	65,282	11.93	329
13.	Passengers and Baggage	285,070	52.11	1,438
14.	Michigan Passengers and Baggage, Line 13		100.00	1,438
15.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 285,070		
16.	Interstate	93,703	32.87	473
17.	Intrastate	191,367	67.13	965

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 460—Other Expenses.

			%	$
1.	System Total, per Annual Report			4,756
2.	Allocated to States by Delf.			
3.	Outside Michigan			17
4.	Common Michigan and Outside Mich.			3,462
5.	Michigan			1,277
6.	Common Michigan and Outside Michigan, Line 4		100.00	3,462
7.	Divided relatively with the total of charges to Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451	$2,352,443		
8.	Outside Michigan	368,284	15.66	542
9.	Michigan	1,984,159	84.34	2,920
10.	Michigan Total Recap:			
11.	Exclusive, Line 5			1,277
12.	Common, Line 9			2,920
13.	Total Michigan			4,197
14.	Michigan Total, Line 13		100.00	4,197
15.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$1,984,159		
16.	Freight	1,437,118	72.43	3,040
17.	Passenger	547,041	27.57	1,157

No. 460, Other Expenses (Continued).

			%	$
18.	Michigan Passenger, Line 17		100.00	1,157
19.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 547,041		
20.	Sleepers and Diners	196,689	35.96	416
21.	Mail and Express	65,282	11.93	138
22.	Passengers and Baggage	285,070	52.11	603
23.	Michigan Passengers and Baggage, Line 22		100.00	603
24.	Divided relatively with the total of chares to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$ 285,070		
25.	Interstate	93,703	32.87	198
26.	Intrastate	191,367	67.13	405

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

No. 461—General Joint Facilities—Dr.

			%	$
1.	System Total, per Annual Report, $455; allocated to Michigan by Delf			62
2.	Allocated to Services by Delf			
3.	Freight			45
4.	Passenger (all Passengers and Baggage)			17
5.	Michigan Passengers and Baggage, Line 4			17
6.	Allocated to Interstate, account of Soo Bridge			6
7.	Balance			11
8.	Michigan Passengers and Baggage other than Soo Bridge, Line 7		100.00	11
9.	Divided relatively with the total of charge to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see page following Account No. 451)	$ 285,070		
10.	Interstate	93,703	32.87	4
11.	Intrastate	191,367	67.13	7
12.	Michigan Interstate Passengers and Baggage Recap.:			
13.	Soo Bridge, Line 6			6
14.	Other, Line 10			4
15.	Total Michigan Interstate Passengers and Baggage			10

NOTE—The Michigan Passenger portion of this charge is made up of the following:

Soo Bridge	$ 5.80
Soo Union Depot	11.31
Total	$17.11

Apportionments of Primary Expense Accounts.

Summary.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Summary of Apportionment of Primary Expense Accounts.

Account.	System Total.	MICHIGAN								
		Total.	Freight	Mineral Range Passenger.	D. S. S. & A. Total.	D. S. S. & A. Sleepers & Diners	D. S. S. & A. Mail & Express	Passenger. Passengers and Baggage. Total	Passengers and Baggage. Interstate	Passengers and Baggage. Intrastate
I. MAINTENANCE OF WAY AND STRUCTURES										
	$	$	$	$	$	$	$	$	$	$
201 Superintendence	24,651	20,487	15,959		4,528	1,609	657	2,262	660	1,602
202 Roadway Maintenance	67,951	57,992	45,926		12,066	3,557	1,786	6,723	1,962	4,761
208 Bridges, Trestles and Culverts	60,062	45,887	34,927		10,960	3,231	1,622	6,107	1,783	4,324
212 Ties	70,021	56,379	43,252		13,127	5,175	1,898	6,054	1,767	4,287
214 Rails	5,433	4,661	3,576		1,085	428	157	500	146	354
216 Other Track Material	23,218	20,097	15,418		4,679	1,844	677	2,158	630	1,528
218 Ballast	3,035	2,976	2,283		693	273	100	320	93	227
220 Track Laying and Surfacing	180,349	145,613	111,709		33,904	13,365	4,903	15,636	4,564	11,072
221 Right-of-Way Fences	6,928	6,081	4,816		1,265	373	187	705	206	499
223 Snow & Sand Fences & Snowsheds	432	196	156		40	12	6	22	6	16
225 Crossings and Signs	1,667	904	716		188	55	28	105	31	74
227 Station and Office Buildings	9,724	9,019	7,546		1,473		147	1,326	387	939
229 Roadway Buildings	2,571	2,515	1,929		586	231	85	270	79	191
231 Water Stations	8,284	6,999	4,894		2,105	848	306	951	278	673
233 Fuel Stations	2,436	2,058	1,439		619	249	90	280	82	198
235 Shops and Enginehouses	20,314	18,180	12,665		5,515	2,202	803	2,510	733	1,777
241 Wharves and Docks	1,316	1,316	1,185		131	43	17	71	21	50
243 Coal and Ore Wharves	12,812	12,812	12,812							
244 Coal and Ore Wharves—Depre'n	19,146	19,146	19,146							
247 Telegraph and Telephone Lines	3,487	2,973	2,328		645	190	96	359	105	254
249 Signals and Interlockers	279	178	169		9	3	1	5	1	4
265 Miscellaneous Structures	140	119	86		33	11	4	18	5	13
269 Roadway Machines	1,776	1,476	1,150		326	116	47	163	48	115

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Summary of Apportionment of Primary Expense Accounts (Continued).

Account.	System Total.	MICHIGAN								
		Total.	Freight	Mineral Range Passenger.	Total.	D. S. S. & A.		Passenger.		
						Sleepers & Diners	Mail & Express	Passengers and Baggage.		
								Total	Interstate	Intrastate
I. MAINTENANCE OF WAY AND STRUCTURES (Continued).										
	$	$	$	$	$	$	$	$	$	$
271 Small Tools and Supplies	6,416	5,332	4,154		1,178	419	171	588	172	416
272 Removing Snow, Ice and Sand	42,980	38,075	31,047		7,028	2,072	1,040	3,916	1,143	2,773
274 Injuries to Persons	1,407	823	663		160	57	23	80	23	57
275 Insurance	4,299	3,789	3,116		673	239	98	336	98	238
276 Stationery and Printing	1,109	922	718		204	72	30	102	30	72
277 Other Expenses	245	204	159		45	16	7	22	6	16
278 Maintaining Jt. Tracks, Yards and Other Facilities—Dr.	13,434	8,402	7,537		865	214	88	563	350	213
279 Maintaining Jt. Tracks, Yards and Other Facilities—Cr.	*13,818	*13,818	*8,375		*5,443	*1,934	*790	*2,719	*794	*1,925
Total Maintenance of Way and Structures	582,104	481,793	383,106		98,687	34,970	14,284	49,433	14,615	34,818
II. MAINTENANCE OF EQUIPMENT.										
301 Superintendence	12,673	10,767	7,766	131	2,870	845	505	1,520	444	1,076
302 Shop Machinery	8,784	7,463	5,449		2,014	593	354	1,067	311	756
308 Steam Locomotives—Repairs	102,989	87,830	56,670	1,523	29,637	11,908	4,302	13,427	3,919	9,508
309 Steam Locomotives—Deprec'n	23,012	19,653	13,704	325	5,624	2,259	816	2,549	744	1,805
310 Steam Locomotives—Retirements	832	809	764		45	18	7	20	6	14
314 Freight Train Cars—Repairs	139,181	119,806	119,806							
315 Freight Train Cars—Deprec'n	60,752	52,292	52,292							
316 Freight Train Cars—Retirements	4,349	3,742	3,742							

*Typewritten in red.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Summary of Apportionment of Primary Expense Accounts (Continued).

Account.	System Total.	MICHIGAN								
		Total.	Freight	Mineral Range Passenger.	Total.	D. S. S. & A.		Passenger.		
						Sleepers & Diners	Mail & Express	Passengers and Baggage.		
								Total	Interstate	Intrastate
II. MAINTENANCE OF EQUIPMENT—(Continued).										
317 Pasenger Train Cars—Repairs	$ 46,155	$ 37,489	$	$ 1,522	$ 35,967	$ 7,323	$ 7,281	$ 21,363	$ 6,236	$ 15,127
318 Passenger Train Cars—Deprec'n	12,367	9,963		300	9,663	4,018	1,435	4,210	1,229	2,981
326 Work Equipment—Repairs	6,599	5,446	4,266		1,180	421	172	587	171	416
327 Work Equipment—Depreciation	3,483	2,875	2,252		623	222	91	310	90	220
328 Work Equipment—Retirements	*8	*7	*5		*2	*1		*1		*1
332 Injuries to Persons	4,325	3,718	3,588		130	38	23	69	20	49
333 Insurance	2,417	2,075	1,581		494	145	87	262	76	186
334 Stationery and Printing	1,316	1,118	816		302	89	53	160	47	113
336 Maintaining Jt. Equipment at Terminals—Dr.	792	15	8		7	2	1	4	1	3
Total Maintenance of Equipment	430,018	365,054	272,699	3,801	88,554	27,880	15,127	45,547	13,294	32,253
III. TRAFFIC.										
351 Superintendence	31,604	26,122	14,542		11,580			11,580	3,380	8,200
352 Outside Agencies	35,100	29,006	14,795		14,211			14,211	13,078	1,133
353 Advertising	4,078	3,363	43		3,320			3,320	2,293	1,027
354 Traffic Associations	278	230	230							
355 Fast Freight Lines	*10	*8	*8							
356 Industrial and Immigration Bureaus	8,464	7,477	5,271		2,206			2,206	644	1,562
357 Insurance	113	59			59			59	17	42
358 Stationery and Printing	9,385	7,759	4,621		3,138			3,138	916	2,222
Total Traffic	89,012	74,008	39,494		34,514			34,514	20,328	14,186

*Typewritten in red.

THIS PAG

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Summary of Apportionment of Primary Expense Accounts (Continued).

Account.	System Total.	MICHIGAN								
		Total.	Freight	Mineral Range Passenger.	D. S. S. & A. Total.			Passenger. Passengers and Baggage.		
						Sleepers & Diners	Mail & Express	Total	Interstate	Intrastate
IV. TRANSPORTATION—RAIL LINE.	$	$	$	$	$	$	$	$	$	$
371 Superintendence	20,755	17,718	13,139	166	4,413	1,469	561	2,383	696	1,687
372 Dispatching Trains	12,804	10,916	8,548		2,368	698	350	1,320	385	935
373 Station Employees	159,423	141,572	118,101		23,471		2,347	21,124	6,166	14,958
374 Weighing, Inspection and Demurrage Bureaus	2,033	1,683	1,683							
375 Coal and Ore Wharves	25,323	25,323	25,323							
376 Station Supplies and Expenses	10,710	9,751	7,512		2,239			2,239	654	1,585
377 Yardmasters and Yard Clerks	4,743	4,743	4,644		99	57	2	40	12	28
378 Yard Conductors and Brakemen	48,036	46,858	45,684		1,174	585	63	526	154	372
379 Yard Switch and Signal Tenders	4,209	4,198	4,066		132	75	3	54	16	38
380 Yard Enginemen	34,640	33,645	32,800		645	427	43	375	109	266
382 Fuel for Yard Locomotives	29,504	28,289	27,572		717	360	37	320	93	227
385 Water for Yard Locomotives	1,821	1,731	1,681		50	21	4	25	7	18
386 Lubricants for Yard Locomotives	581	569	559		10	5		5	1	4
387 Other Supplies for Yard Locomotives	433	426	419		7	4		3	1	2
388 Enginehouse Expenses—Yard	15,814	15,489	15,157		332	174	14	144	42	102
389 Yard Supplies and Expenses	1,386	1,360	1,315		45	26	1	18	5	13
390 Op. Joint Yards and Terminals—Dr.	25,994	17,212	11,013		6,199	2,492	907	2,800	817	1,983
391 Operating Joint Yards and Terminals Cr.	*13,477	*13,477	*11,729		*1,748	*703	*256	*789	*230	*559
392 Train Enginemen	174,317	145,459	84,913	$ 3,180	57,366	23,061	8,393	25,912	7,564	18,348
394 Fuel for Train Locomotives	301,342	251,254	164,708	4,548	81,998	32,963	11,996	37,039	10,812	26,227
397 Water for Train Locomotives	14,354	11,968	7,846	217	3,905	1,570	571	1,764	515	1,249

*Typewritten in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Summary of Apportionment of Primary Expense Accounts (Continued).

Account.	System Total.	MICHIGAN								
		Total.	Freight	Mineral Range Passenger.	D. S. S. & A. Total.	D. S. S. & A. Sleepers & Diners	D. S. S. & A. Mail & Express	Passenger. Passengers and Baggage. Total	Interstate	Intrastate
	$	$	$	$	$	$	$	$	$	$
IV. TRANSPORTATION—RAIL LINE—(Continued).										
398 Lubricants for Train Locomotives	5,615	4,681	3,068	85	1,528	614	224	690	201	489
399 Other Supplies for Train Locomotives	2,667	2,222	1,456	28	738	297	108	333	97	236
400 Enginehouse Expenses—Train	45,259	39,329	22,930		16,399	6,592	2,399	7,408	2,162	5,246
401 Trainmen	201,769	167,499	114,921	2,847	49,731	8,368	4,210	37,153	10,845	26,308
402 Train Supplies and Expenses	34,399	28,620	6,457	1,200	20,963	6,333	3,186	11,444	3,341	8,103
403 Operating Sleeping Cars	13,954	10,566			10,566	10,566				
404 Signal and Interlocker Op.	1,540	311	295		16	5	2	9	3	6
405 Crossing Protection	8,639	8,159	7,731		428	126	63	239	70	169
407 Telegraph and Telephone Oprs.	174	148	105		43	15	5	23	7	16
410 Stationery and Printing	12,105	10,324	7,049		3,275	1,109	406	1,760	514	1,246
411 Other Expenses	1,214	997	926		71	24	9	38	11	27
412 Opr. Jt. Trks and Facilities—Dr.	4,502	1,083	988		95	7	2	86	79	7
413 Opr. Jt. Trks. and Facilities—Cr.	*4,928	*3,478	*2,541		*937	*317	*116	*504	*147	*357
414 Insurance	1,827	1,443	1,223		220	75	27	118	34	84
415 Clearing Wrecks	1,151	1,065	795		270	91	34	145	42	103
416 Damage to Property	599	594	554		60	20	8	32	9	23
417 Damage to Live Stock on Rt. of Way	422	400	77		323	109	40	174	51	123
418 Loss and Damage—Freight	6,971	5,773	5,773							
419 Loss and Damage—Baggage	155	138			138			138	40	98
420 Injuries to Persons	10,618	6,916	5,078		1,838	622	228	988	288	700
Total Transportation—Rail Line	1,223,397	1,043,477	741,819	12,271	289,387	97,940	35,871	155,576	45,466	110,110

* Typewritten in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Summary of Apportionment of Primary Expense Accounts (Continued).

Account.	System Total.	MICHIGAN								
		Total.	Freight	Mineral Range Passenger.	D. S. S. & A. Total.	D. S. S. & A. Sleepers & Diners	D. S. S. & A. Mail & Express	Passenger. Total	Passenger. Interstate	Passenger. Intrastate
VI. MISCELLANEOUS OPERATIONS.	$	$	$	$	$	$	$	$	$	$
441. Dining and Buffet Service	43,984	35,899			35,899	35,899				
VII. GENERAL.										
451 Salaries and Exp. of Gen. Officers	25,342	21,373	15,480		5,893	2,119	703	3,071	1,009	2,062
452 Salaries and Exp. of Clerks and Attendants	37,898	31,963	21,904		10,059	3,617	1,200	5,242	1,723	3,519
453 Gen. Office Supplies and Expenses	4,070	3,431	2,516		915	329	109	477	157	320
454 Law Expenses	(a)10,230	8,785	5,757		3,028	1,006	565	1,457	479	978
455 Insurance	143	121	88		33	12	4	17	6	11
457 Pensions	4,020	3,390	2,455		935	336	112	487	160	327
458 Stationery and Printing	5,005	4,221	3,063		1,158	416	138	604	199	405
459 Valuation Expenses	12,034	10,010	7,250		2,760	993	329	1,438	473	965
460 Other Expenses	4,756	4,197	3,040		1,157	416	138	603	198	405
461 General Jt. Facilities—Dr.	455	62	45		17			17	10	7
Total General	103,953	87,553	61,598		25,955	9,244	3,298	13,413	4,414	8,999
RECAPITULATION:										
I Maintenance of Way and Structure	582,104	481,793	383,106		98,637	34,970	14,284	49,433	14,615	34,818
II Maintenance of Equipment	430,018	365,054	272,699	3,801	88,554	27,880	15,127	45,547	13,294	32,253
III Traffic	89,012	74,008	39,494		34,514			34,514	20,328	14,186
IV Transportation	1,223,397	1,043,477	741,819	12,271	289,387	97,940	35,871	155,576	45,466	110,110
VI Miscellaneous Expenses	43,984	35,899			35,899	35,899				
VII General Expenses	103,953	87,553	61,598		25,955	9,244	3,298	13,413	4,414	8,999
Grand Total	2,472,468	2,087,784	1,498,716	16,072	572,996	205,933	68,580	298,483	98,117	200,366

(a)—This amount excludes, on account of cost of this suit, $9,676.

Apportionments of Revenues.

Details and Summary.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Summary of Railway Operating Revenue Accounts.

Account.		System Total.	MICHIGAN			D. S. S. & A.			Passenger.		
			Total.	Freight	Mineral Range Passenger.	Total.	Sleep. ers & Diners	Mail & Express	Passengers and Baggage		
									Total	Interstate	Intrastate
RAILWAY OPERATING REVENUES:		$	$	$	$	$	$	$	$	$	$
101	Freight	2,316,448	2,067,559	2,067,559							
102	Passenger	890,511	770,755			770,755			770,755	226,574	544,181
103	Excess Baggage	8,192	7,482			7,482			7,482	2,861	4,621
104	Sleeping Cars	39,450	30,390			30,390	30,390				
105	Parlor and Chair Cars	4,489	4,489			4,489	4,489				
106	Mail	72,758	58,203			58,203		58,203			
107	Express	30,578	27,818			27,818		27,818			
108	Other Passenger Train	1,131	906			906			906	300	606
109	Milk	512	101			101			101		101
110	Switching	21,870	12,235	12,235							
111	Special Service Train	5,263	3,969	2,357		1,612			1,612	33	1,579
112	Other Freight Train	62	62	62							
131	Dining and Buffet Service	35,241	27,939			27,939	27,939				
133	Station, Train and Boat Privileges	600	495			495			495	146	349
134	Parcel Room	523	523			523			523	154	369
135	Storage—Freight	981	936	936							
136	Storage—Baggage	82	82			82			82	24	58
137	Demurrage	6,317	5,920	5,920							
138	Telegraph and Telephone Service	613	579	398		181			181	53	128
142	Rents of Bldgs. and Other Property	6,661	6,573	6,042		531			531	156	375
143	Miscellaneous	56,334	56,148	55,471		677			677	199	478
151	Joint Facilities—Dr.	7,652	2,645	1,413		1,232			1,232	517	715
152	Joint Facilities—Cr.	*397	*397	*277		*120			*120	*35	*85
	Total Operating Revenue	3,505,873	3,085,412	2,152,116		933,296	62,818	86,021	784,457	230,982	553,475

* Typewritten in red.

NOTE—Account No. 142 excludes $922 received from non-operated property, which is not inventoried. (See Delf. Exhibits.)

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Income Account.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

The presentation of the following computations of income is not intended to waive the claim that the passenger earnings of the Mackinaw Transportation Company are to be added to the net corporate income of the passenger business, particularly if sleeping car and dining car operations are to be included.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Hire of Equipment.

	System	Michigan	Michigan Freight	Michigan Passenger	Passengers & Baggage	Sleepers & Diners
RENT RECEIVED FOR HIRE AND EQUIPMENT.						
Locomotives leased to Soo Bridge Switching account (a)	$7,710.00	$6,539.62	$5,497.20	$1,042.42		
Locomotives leased to others, Passenger (c)	1,309.59	1,097.44		1,097.44		
Freight	5,756.97	4,792.68	4,792.68			
Work (b)	286.29	217.97	170.76	47.21		
Various	452.43	421.81	406.56	15.25		
	15,515.28	13,069.52	10,867.20	2,202.32		
Passenger Cars	394.38	323.53		323.53		
Work Equipment	1,376.18	1,128.63	884.17	244.46		
	17,285.84	14,522.46	11,751.37	2,770.31	2,770.31	
		Interstate 29.40%			814.47	
		Intrastate 70.60%			1,955.84	
RENT PAID FOR HIRE OF EQUIPMENT.						
For Freight Train Cars (Balance)	21,824.62	17,902.90	17,902.90			
Locomotives	3,473.70	2,849.48	2,844.83	4.65	4.65	
Passenger Train Cars	702.31	576.15		576.15	576.15	
Sleepers	1,357.42	1,113.45		1,113.45		1,113.45
Work Equipment	2.31	1.89	1.48	.41	.41	
	27,360.56	22,443.87	20,749.21	1,694.66	581.21	1,113.45
		Interstate 29.40%			170.88	
		Intrastate 70.60%			410.33	

On same basis as Delf., except as follows:
(a) On basis of use by the D. S. S. & A.
(b) On the basis of Repair of Work of Equipment to Passenger, 21.66%, and Freight, 78.34%.
(c) On basis of mileage of individual locomotives.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Joint Facilities—Income Cr.
Michigan.

	Michigan Total	Michigan Freight	Michigan Passenger	Common
Main Line, Michigamme to Beaufort, C. & N. W. Frts.	2,150.98			2,150.98
Main Line, Ishpeming to Marquette, C. & N. W. Passenger	1,050.02		1,050.02	
Main Line, Negaunee to Calumet, C. & N. W. Passenger	6,546.82		6,546.82	
Main Line, Champion to Calumet, C., M. & St. P. Passenger	4,117.50		4,117.50	
Main Line, Houghton to Pilgrim, M. R. Frts.	3,457.77			3,457.77
Mine Yard—Ishpeming—L. S. & I. Switch Engine	1,208.88	1,208.88		
Land—Negaunee Union Depot	150.00		150.00	
Union Depot Tracks—C. & N. W. Passenger	57.00			57.00
Enginehouse, Houghton, M. R. Engines	212.00	212.00		
Yard Tracks, Marquette, M. M. S. E.	220.00	220.00		
	19,170.97	1,640.88	11,864.34	5,665.75
Common to Freight 69.69%, Pass. 30.31%		3,948.46	1,717.29	
	19,170.97	5,589.34	13,581.63	
28/191 of C. & N. W. to Mineral Range	994.02		994.02	
14/78 of C., M. & St. P. to Mineral Range	739.04		739.04	
	1,733.06		1,733.06	
	17,437.91	5,589.34	11,848.57	
Passenger to Intra 70.60%			8,365.09	
Inter 29.40%			3,483.48	

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Taxes.

			Per Cent	$
1.	System Total, per Annual Report	$ 251,780		
2.	Specific Taxes on Sleeping Car Tickets	309		
		$251,471		
3.	Michigan Total, per Annual Report			223,308
4.	Specific Tax on Sleeping Car Tickets, Etc.			259
				233,049
5.	Michigan Taxes assigned to Services relatively with the allocation and assignment of the operating expenses	2,087,784	100.00	233,049
6.	Freight	1,498,716	71.79	167,306
7.	Mineral Range Passenger.	16,072	.77	1,794
8.	D. S. S. & A. Passenger	572,996	27.44	63,949
9.	D. S. S. & A. Passenger	572,996	100.00	63,949
10.	Sleepers and Diners	205,933	35.94	22,983
11.	Mail and Express	68,580	11.97	7,655
12.	Passengers and Baggage.	298,483	52.09	33,311
13.	Sleeper and Diner Recap:			
14.	Amount from Line 4			259
15.	Amount from Line 10			22,983
				23,242
16.	Passengers and Baggage	298,483	100.00	33,311
17.	Interstate	98,117	32.87	10,949
18.	Intrastate	200,366	67.13	22,362

The above assignment of taxes is for temporary use.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1916.

Income Account.

		System Total	MICHIGAN			D. S. S. & A. Passenger				
			Total	Freight	Mineral Range	Total	Sleepers & Diners	Mail & Express	Passengers and Baggage Total	Passengers and Baggage Interstate	Passengers and Baggage Intrastate
Railway Operating Revenues		$3,505,873	$3,085,412	$2,152,116	$	$933.296	$ 62,818	$86,021	$784,457	$230,982	$553,475
Railway Operating Expenses		2,472,468	2,087,784	1,498,716	16,072	572,996	205,933	68,580	298,483	98,117	200,366
		1,033,405	997,628	653,400	*16,072	360,300	*143,115	17,441	485,974	132,865	353,109
Additions:											
Rents Received for Hire of Equipment	(a)	17,286	14,522	11,752		2,770			2,770	814	1,956
Joint Facilities—Dr.	(b)	19,421	19,171	5,589	1,733	11,849			11,849	8,365	3,484
Interest—Cr.		16,081	13,194	9,195		3,999			3,999	2,823	1,176
		1,086,193	1,044,515	679,936	*14,339	378,918	*143,115	17,441	504,592	144,867	359,725
Deductions:											
Rents Paid for Hire of Equipment	(a)	27,361	22,444	20,749		1,695	1,114		581	171	410
Joint Facilities—Dr.		38,482	10,610	8,644		1,966			1,966	1,148	818
Miscellaneous Interest—Dr.		8	7	5		2			2	1	1
Miscellaneous Rents		44	37	37							
Taxes	(c)	251,780	233,308	167,306	1,794	64,208	23,242	7,655	33,311	10,949	22,362
		317,675	266,406	196,741	1,794	67,871	24,356	7,655	35,860	12,269	23,591
Net Corporate Income		788,518	778,109	483,195	*16,133	311,047	*167,471	9,786	468,732	132,598	336,134

*Typewritten in red.
(a) Details on third preceding page.
(b) Details on second preceding page.
(c) Details on first preceding page.

DULUTH SOUTH SHORE & ATLANTIC

RATE CASE

Cost of Passenger Service,

Fiscal Year 1917.

RATIOS

And Other Data

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Ratio No. 1, Michigan Gross Ton Miles on Common Tracks.

	Total	Freight	Passenger
Freight:			
Freight Train Cars	287,426,296	287,426,296	
Train Load	291,582,826	291,582,826	
Locomotives	106,395,549	106,395,549	
Yard Switching on Common Tracks	34,475,755	34,475,755	
Train Switching on Com. Tracks	15,772,124	15,772,124	
Passenger:			
Passenger Train Cars	166,318,659		166,318,659
Train Load	7,833,700		7,833,700
Locomotives	83,237,457		83,237,457
Yard Switching on Common Tracks	486,939		486,939
Train Switching on Common Tracks	350,358		350,358
Totals	993,879,663	735,652,550	258,227,113
Per Cent	100.00	74.02	25.98

Ratio No. 1 a, Michigan Passenger Gross Ton Miles on Common Tracks.

	Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
Passenger Train Cars	166,318,659	66,222,213	21,702,266	78,394,180
Train Load	7,833,700		2,818,249	5,015,451
Locomotives (a)	83,237,457	31,655,205	11,719,834	39,862,418
Yard Switching	486,939	308,817	19,477	158,645
Train Switching	350,358		58,393	291,965
Totals	258,227,113	98,186,235	36,318,219	123,722,659
Per Cent	100.00	38.02	14.07	47.91

(a) Apportioned relatively with the ton miles of Passenger Train Cars and loads as follows:

	Car Ton Miles	Load Ton Miles	Total Ton Miles	Per Cent	Locomotive Ton Miles
Sleepers and Diners	66,222,213		66,222,213	38.03	31,655,205
Mail and Express	21,702,266	2,818,249	24,520,515	14.08	11,719,834
Pass. and Baggage	78,394,180	5,015,451	83,409,631	47.89	39,862,418
	166,318,659	7,833,700	174,152,359	100.00	83,237,457

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Ratio No. 1 b, Michigan Gross Ton Miles of Passenger Trains Operated on the D., S. S. & A. by the D., S. S. & A.

	Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
Passenger Train Cars	162,897,160	65,902,473	21,678,710	75,315,977
Train Load	7,516,660		2,501,609	5,015,051
Locomotives (a)	80,701,137	31,207,130	11,451,491	38,042,516
Totals	251,114,957	97,109,603	35,631,810	118,373,544
Per Cent	100.00	38.67	14.19	47.14

(a) Apportioned relatively with the ton miles of Passenger Train Cars and Loads as follows:

Service	Car Ton Miles	Load Ton Miles	Total Ton Miles	Per Cent	Locomotive Ton Miles
Sleepers and Diners	65,902,473		65,902,473	38.67	31,207,130
Mail and Express	21,678,710	2,501,609	24,180,319	14.19	11,451,491
Pass. and Baggage	75,315,977	5,015,051	80,331,028	47.14	38,042,516
	162,897,160	7,516,660	170,413,820	100.00	80,701,137

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Ratio No. 2, Michigan Equated Track Miles of Track Maintained by the D., S. S. & A.

	Actual Mileage				Equated Mileage			
	Total	Fr't	Com-mon	Pas-senger	Total	Fr't	Com-mon	Pas-sen-ger
Main Line	420.92	12.07	408.85		420.92	12.07	408.85	
Second Tracks	6.55		6.55		6.55		6.55	
Spurs, Industrial	20.76	20.76			10.38	10.38		
Spurs, Mines	20.87	20.87			10.43	10.43		
Sidings	159.61	116.71	40.80	2.10	79.81	58.36	20.40	1.05
Totals	628.71	170.41	456.20	2.10	528.09	91.24	435.80	1.05
Per Cent					100.00	17.28	82.52	0.20

NOTE:—The above equation on the following basis:

Main and Second Tracks	1.00
Spurs and Sidings	.50

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Ratio No. 3, Michigan Passenger Train Car Miles Including C., M. & St. P. and C. & N. W. Into Marquette.

	Total Car Miles—Michigan.			
	Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
Passenger Cars	1,776,983		21,600	1,755,383
Passenger Cars, Special	4,111			4,111
Other Passenger Train Cars	859,653		536,640	323,013
Other Passenger Train Cars, Special	302			302
Sleepers, Par. and Obser., For'n	206,860	206,860		
Sleepers, Par. and Obser., Special	2,474	2,474		
Diners, Foreign	48,982	48,982		
Sleepers, D., S. S. & A.	516,110	516,110		
Diners, D., S. S. & A.	115,361	115,361		
Observation—Diners, D., S. S. & A.	177,602	177,602		
Passenger Cars, C., M. & St. P. and C. & N. W.	67,459			67,459
Other Passenger Train Cars, C., M. & St P. and C. & N. W.	30,056		1,179	28,877
Sleepers, C., M. & St. P. and C. & N. W.	4,380	4,380		
Totals	3,810,333	1,071,769	559,419	2,179,145
Per Cent	100.00	28.13	14.68	57.19

Ratio No. 3 a, Michigan Passenger Train Car Miles Excluding the C., M. & St. P. and the C. & N. W. Into Marquette.

	Car Miles—Michigan.			
	Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
Total as Above	3,810,333	1,071,769	559,419	2,179,145
De'ct C., M. & St. P. and C. & N. W.	101,895	4,380	1,179	96,336
Totals	3,708,438	1,067,389	558,240	2,082,809
Per Cent	100.00	28.78	15.05	56.17

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Ratio No. 3 b, Michigan Passenger Train Car Miles, D. S. S. & A. Trains on D., S. S. & A. Tracks, Exclusive of Sleepers and Diners.

	Total	Passengers & Baggage	Mail & Express
Passenger Cars	1,776,983	1,755,383	21,600
Passenger Cars, Special	4,111	4,111	
Other Passenger Train Cars	859,653	323,013	536,640
Other Passenger Train Cars, Special	302	302	
Totals	2,641,049	2,082,809	558,240
Per Cent	100.00	78.86	21.14

Ratio No. 3 c, System Passenger Train Car Miles (other than Sleepers and Diners) on the D. S. S. & A. and Mineral Range.

	Car Miles	Per Cent
Michigan D. S. S. & A. Cars on D. S. S. & A.	2,280,010	79.71
Michigan D. S. S. & A. Cars on Mineral Range	109,648	3.84
Outside Michigan D. S. S. & A. Cars on D. S. S. & A.	470,612	16.45
Totals	2,860,270	100.00

Ratio No. 3 d, Michigan Passenger Train Car Miles (D. S. S. & A.) Divided to Mail and Express and Passengers and Baggage.

	Car Miles	Per Cent
Mich. Passenger Train Cars, Passengers and Baggage	1,721,770	75.52
Mich. Passenger Train Cars, Mail and Express	558,240	24.48
Totals	2,280,010	100.00

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Ratio No. 4, Time of Trains and Switching on Common Tracks in Michigan.

	Mileage	Minutes per Mile	Total Time in Minutes	Passenger Time	Freight Time
Passenger Trains	780,428	2.4862	1,940,300	1,940,300	
Freight Trains	820,729	6.0559	4,970,253		4,970,253
Mixed Trains	17,010	2.0227	49,715	6,955	42,760
Special Passenger	200	2.4862	497	497	
Special Mixed	1,333	6.0559	8,073	2,196	5,877
	1,619,700		6,968,838	1,949,948	5,018,890
Deduct for train left on exclusive tracks	5,136	10.	51,360		51,360
	1,614,564		6,917,478	1,949,948	4,967,530
Add Yard Switching on common tracks:					
Passenger	3,618	10.	36,180	36,180	
Freight	161,092	10.	1,610,920		1,610,920
Totals	1,779,274		8,564,578	1,986,128	6,578,450
Per Cent			100.00	23.19	76.81

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Ratio No. 4 a, System, Time of Use of Tracks, Passenger and Freight Trains and Yard Switching.

	System Miles	Minutes per Mile	Total Time in Minutes	Passenger Time	Freight Time
Passenger Trains	938,412	2.4862	2,316,189	2,316,189	
Freight Trains	1,001,497	6.0559	6,064,966		6,064,966
Mixed Trains	17,010	2.9227	49,715	6,955	42,760
Special Passenger	376	2.4862	928	928	
Special Mixed	1,397	6.0559	8,460	2,297	6,163
Pass. Yard Switching	7,665	10.	76,650	76,650	
Freight Yd. Switching	319,399	10.	3,193,990		3,193,990
Totals	2,285,756		11,710,898	2,403,019	9,307,879
Per Cent			100.00	20.52	79.48

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Ratio No. 10, Michigan Passenger Miles.

	Miles	%
Intrastate Passengers, one mile	23,630,061	70.67
Interstate Passengers, one mile	9,806,277	29.33
TOTAL	33,436,338	100.00

Ratio No. 11 a, System Revenue Freight Train Miles.

	Miles	%
Michigan Freight Train Miles	836,330	82.22
Outside Michigan Freight Train Miles	180,814	17.78
TOTAL	1,017,144	100.00

Ratio No. 11 b, System Revenue Passenger Train Miles.

	Miles	%
Michigan Passenger Train Miles	751,666	82.61
Outside Michigan Passenger Train Miles	158,178	17.39
TOTAL	909,844	100.00

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Ratio No. 17, Allocated Station Pay Roll—Michigan.

	Amount	%
	$	
Allocated Passenger Employees	11,412.79	12.58
Allocated Freight Employees	79,330.95	87.42
TOTAL	90,743.74	100.00

Ratio No. 17 a, Passenger Trainmen's Pay Roll.

	Amount	%
	$	
Conductors, January and May	5,769.45	53.53
Brakemen, January and May	3,074.85	28.53
Baggagemen, January and May	1,932.80	17.94
TOTAL	10,777.10	100.00

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Passenger and Freight Switching in Various Michigan Yards and Ratios No. 13, No. 13 a, No. 13 b and No. 13 c.

	Switching Miles				Subdivision of Passenger		
	Total	Freight	Passenger	Passenger %	Mail & Express	Sleepers & Diners	Passengers & Ba'ge
Marquette	155,334	149,859	5,475	3.52	1.92	57.37	40.71
St. Ignace	57,816	55,626	2,190	3.79	12.94	33.09	53.97
Houghton	41,220	41,220					
Ishpeming-Neg'nee	55,456	55,456					
TOTALS	309,826	302,161	7,665	2.47	5.06	50.44	44.50
Train Switching	147,704	145,490	2,214		16.67		83.33
Total all Switching	457,530	447,651	9,879	2.16	7.66	39.14	53.20

	%
Ratio No. 13, Total Switching:	
Passenger	2.16
Freight	97.84
Ratio No. 13 a, Yard Switching:	
Passenger	2.47
Freight	97.53
Ratio No. 13 b, Yard Switching Assigned to Services:	
Mail and Express	5.06
Sleepers and Diners	50.44
Passengers and Baggage	44.50
Ratio No. 13 c, All Switching Assigned to Services:	
Mail and Express	7.66
Sleepers and Diners	39.14
Passengers and Baggage	53.20

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Locomotive Mileage.

	SYSTEM			MICHIGAN		
	Total	Passenger	Freight	Total	Passenger	Freight
Passenger	941,753	941,753		780,592	780,592	
Freight	1,115,897		1,115,897	927,702		927,702
Mixed	17,072	2,388	14,684	17,072	2,388	14,684
Special Passenger	610	610		425	425	
Special Mixed	1,507	417	1,090	1,443	392	1,051
	2,076,839	945,168	1,131,671	1,727,234	783,797	943,437
Switching:						
Train Passenger	2,214	2,214		2,214	2,214	
Train Freight	167,044		167,044	145,490		145,490
Yard Passenger	7,665	7,665		7,665	7,665	
Yard Freight	319,399		319,399	302,161		302,161
	496,322	9,879	486,443	457,530	9,879	447,651
M. R. Passenger	43,410	43,410		43,410	43,410	
C.&N.W. Passenger	10,980	10,980		10,980	10,980	
C.M.&St.P. Pass.	20,724	20,724		20,724	20,724	
	31,704	31,704		31,704	31,704	

Mixed Locomotive Miles on per cent of Passenger Cars in Mixed Trains, 13.99.

Special Mixed Locomotive Miles on per cent of Passenger Cars in Special Mixed Trains: System 27.67, Michigan 27.15.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Train Mileage and Train Switching.
Used in Various Accounts.

	SYSTEM			MICHIGAN		
	Total	Passenger	Freight	Total	Passenger	Freight
Trains:						
Passenger	906,708	906,708		748,724	748,724	
Freight	1,001,497		1,001,497	820,729		820,729
Mixed	17,010	2,380	14,630	17,010	2,380	14,630
Special:						
Passenger	474	474		298	298	
Mixed	1,299	359	940	1,235	335	900
	1,926,988	909,921	1,017,067	1,587,996	751,737	836,259
Train Switching:						
Passenger	2,214	2,214		2,214	2,214	
Freight	167,044		167,044	145,490		145,490
	169,258	2,214	167,044	147,704	2,214	145,490
M. R. Passenger	43,410	43,410		43,410	43,410	
C.M.&St.P. Pass.	20,724	20,724		20,724	20,724	
C.&N.W. Passenger	10,980	10,980		10,980	10,980	
	31,704	31,704		31,704	31,704	
Light Locomotive Miles				69,129	18,059	51,070
Light Locomotive Miles, Special				296	155	141
				69,425	18,214	51,211

Mixed Trains on per cent of Passenger Cars in Mixed Trains, 13.99.
Special Mixed Trains on per cent of Passenger Cars in such trains: System 27.67, Michigan 27.15.

Apportionments of Primary Expense Accounts

DETAILS

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

The basic figures, as used in the following computations and divisions of expenses, are used as taken from the books and records of the company, without adjustment for the purpose of reducing them to those necessary for a normal year of operation, and are subject to adjustments to be made to eliminate expenditures to make good deferred maintenance, and those for additions and betterments, etc.

It is the claim of defendants that the expenses in the Maintenance of Way group of this year were excessive in at least the amount of $90,000.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Accounts against which there were no charges for the year.

I. Maintenance of Way and Structures.

Nos.
203 Roadway—Depreciation.
204 Underground Power Tubes.
205 Underground Power Tubes—Depreciation.
206 Tunnels and Subways.
207 Tunnels and Subways—Depreciation.
209 Bridges, Trestles and Culverts—Depreciation.
210 Elevated Structures.
211 Elevated Structures—Depreciation.
213 Ties—Depreciation.
215 Rails—Depreciation.
217 Other Track Material—Depreciation.
219 Ballast—Depreciation.
222 Right-of-Way Fences—Depreciation.
224 Snow and Sand Fences and Snowsheds—Depreciation.
226 Crossings and Signs—Depreciation.
228 Station and Office Buildings—Depreciation.
230 Roadway Buildings—Depreciation.
232 Water Stations—Depreciation.
234 Fuel Stations—Depreciation.
236 Shops and Enginehouses—Depreciation.
237 Grain Elevators.
238 Grain Elevators—Depreciation.
239 Storage Warehouses.
240 Storage Warehouses—Depreciation.
242 Wharves and Docks—Depreciation.
245 Gas Producing Plants.
246 Gas Producing Plants—Depreciation.
248 Telegraph and Telephone Lines—Depreciation.
250 Signals and Interlockers—Depreciation.
251 Power Plant Dams, Canals and Pipe Lines.
252 Power Plant Dams, Canals and Pipe Lines—Depreciation.
253 Power Plant Buildings.
254 Power Plant Buildings—Depreciation.
255 Power Sub-station Buildings.
256 Power Sub-station Buildings—Depreciation.
257 Power Transmission Systems.
258 Power Transmission Systems—Depreciation.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Accounts against which there were no charges for the year.

1. Maintenance of Way and Structures. —(Continued.)

Nos.	
259	Power Distribution Systems.
260	Power Distribution Systems—Depreciation.
261	Power Line Poles and Fixtures.
262	Power Line Poles and Fixtures—Depreciation.
263	Underground Conduits.
264	Underground Conduits—Depreciation.
266	Miscellaneous Structures—Depreciation.
267	Paving.
268	Paving—Depreciation.
270	Roadway Machines—Depreciation.
273	Assessments for Public Improvements.

II. Maintenance of Equipment.

303	Shop Machinery—Depreciation.
304	Power Plant Machinery.
305	Power Plant Machinery—Depreciation.
306	Power Sub-station Apparatus.
307	Power Sub-station Apparatus—Depreciation.
311	Other Locomotives—Repairs.
312	Other Locomotives—Depreciation.
313	Other Locomotives—Retirements.
319	Passenger Train Cars—Retirements.
320	Motor Equipment of Cars—Repairs.
321	Motor Equipment of Cars—Depreciation.
322	Motor Equipment of Cars—Retirements.
323	Floating Equipment—Repairs.
324	Floating Equipment—Depreciation.
325	Floating Equipment—Retirements.
329	Miscellaneous Equipment—Repairs.
330	Miscellaneous Equipment—Depreciation.
331	Miscellaneous Equipment—Retirements.
335	Other Expenses.

PAGE CUT OFF

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Accounts against which there were no charges for the year.

III. Traffic Expenses.

Nos.

359 Other Expenses.

IV. Transportation—Rail Line.

381 Yard Motormen.
383 Yard Switching Power Produced.
384 Yard Switching Power Purchased.
393 Train Motormen.
395 Train Power Produced.
396 Train Power Purchased.
406 Drawbridge Operation.
408 Operating Floating Equipment.
409 Express Service.

V. Transportation—Water Line.

431 Operation of Vessels.
432 Operation of Terminals.
433 Incidental.

VI. Miscellaneous Operations.

442 Hotels and Restaurants.
443 Grain Elevators.
444 Stock Yards.
445 Producing Power Sold.
446 Other Miscellaneous Operations.

VII. General Expenses.

456 Relief Department Expenses.

I. MAINTENANCE OF WAY AND STRUCTURES.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

I. MAINTENANCE OF WAY AND STRUCTURES.

No. 201, Superintendence.

			%	$
1.	System Total, per Annual Report		100.00	27,129
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accts. 202 to 243 inclusive, 247, 249 and 272 (see detail page following)	$685,906		
3.	Outside Michigan	139,911	20.40	5,534
4.	Michigan	545,995	79.60	21,595
5.	Michigan Total, Line 4		100.00	21,595
6.	Divided relatively with the total of charges to Michigan Freight and Passenger on Accts. 202 to 243 inclusive, 247, 249 and 272 (see detail page following)	$545,995		
7.	Freight	433,485	79.39	17,144
8.	Passenger	112,510	20.61	4,451
9.	Michigan Passenger, Line 8		100.00	4,451
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accts. 202 to 243 inclusive, 247, 249 and 272 (see detail page following)	$112,510		
11.	Sleepers and Diners	39,417	35.03	1,559
12.	Mail and Express	15,881	14.12	629
13.	Passengers and Baggage	57,212	50.85	2,263
14.	Michigan Passengers and Baggage, Line 13		100.00	2,263
15.	Divided on Michigan Passenger Miles, Ratio No. 10			
16.	Interstate		29.33	664
17.	Intrastate		70.67	1,599

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Details for Dividing Accounts Nos. 201, 269, 271, 274, 275, 276, 277, 278 and 279.

Acct. No.	System Total	Outside Michigan	MICHIGAN					
			Total	Freight	Passenger Total	Sleepers & Diners	Mail & Express	Passengers & Bag'ge
	$	$	$	$	$	$	$	$
202	67,154	15,652	51,502	41,543	9,959	2,801	1,462	5,696
208	56,221	38,600	17,621	13,727	3,894	1,095	572	2,227
212	78,794	18,460	60,334	47,278	13,056	4,964	1,837	6,255
214	35,448	1,373	34,075	26,702	7,373	2,803	1,037	3,533
216	36,880	6,264	30,616	23,991	6,625	2,519	932	3,174
218	15,694	856	14,838	11,627	3,211	1,221	452	1,538
220	264,791	45,938	218,853	171,496	47,357	18,005	6,663	22,689
221	7,515	1,716	5,799	4,677	1,122	316	165	641
223	796	39	757	611	146	41	21	84
225	2,911	328	2,583	2,084	499	140	73	286
227	12,750	845	11,905	9,554	2,351		235	2,116
229	6,363	166	6,197	4,856	1,341	510	189	642
231	6,834	1,065	5,769	4,121	1,648	639	233	776
233	8,542	1,331	7,211	5,152	2,059	798	291	970
235	7,620	920	6,700	4,813	1,887	702	274	911
241	2,878		2,878	1,765	1,113	368	144	601
243	17,285		17,285	17,285				
247	6,053	910	5,143	4,108	1,035	291	152	592
249	1,382	695	687	651	36	10	5	21
265	58	6	52	41	11	4	1	6
272	49,937	4,753	45,184	37,397	7,787	2,190	1,143	4,454
Total	685,906	139,917	545,989	433,479	112,510	39,417	15,881	57,212

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 202, Roadway Maintenance.

		%	$
1.	System Total, per Annual Report, $67,154; allocated to Michigan by Delf		51,502
2.	Subdivided into sub-primary accounts:		
3.	Care of Roadbed		3,762
4.	General Cleaning		14,490
5.	Watching Roadway		31,165
6.	Track Changes		166
7.	Train Service		1,717
8.	Bank Protection		202
9.	Michigan Total, Line 1	100.00	51,502
10.	Divided on Mich. Equated Track Miles, Ratio No. 2:		
11.	Freight	17.28	8,900
12.	Common Freight and Passenger	82.52	42,499
13.	Passenger	.20	103
14.	Michigan Common, Line 12	100.00	42,499
15.	Divided on Michigan Time, Ratio No. 4:		
16.	Freight	76,81	32,643
17.	Passenger	23.19	9,856
18.	Michigan Freight Recap.:		
19.	Exclusive, Line 11		8,900
20.	Common, Line 16		32,643
21.	Total Michigan Freight		41,543
22.	Michigan Passenger Recap.:		
23.	Exclusive, Line 13		103
24.	Common, Line 17		9,856
25.	Total Michigan Passenger		9,959
26.	Michigan Passenger, Line 25	100.00	9,959
27.	Divided on Michigan Total Passenger Train Car Miles, Ratio No. 3:		
28.	Sleepers and Diners	28.13	2,801
29.	Mail and Express	14.68	1,462
30.	Passengers and Baggage	57.19	5,696
31.	Michigan Passengers and Baggage, Line 30	100.00	5.696
32.	Divided on Michigan Passenger Miles, Ratio No. 10:		
33.	Interstate	29.33	1,671
34.	Intrastate	70.67	4,025

NOTE:—This account corresponds with Group B, of Accounts, No. 6 under the old classification.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 208, Bridges, Trestles and Culverts.

		%	$
1.	System Total, per Annual Report, $56,221; allocated to Michigan by Delf		17,621
2.	Allocated to Services (see following page):		
3.	Freight		828
4.	Common Freight and Passenger		16,793
5.	Michigan Common, Line 4	100.00	16,793
6.	Divided on Michigan Time, Ratio No. 4:		
7.	Freight	76.81	12,899
8.	Passenger	23.19	3,894
9.	Michigan Freight Recap.:		
10.	Exclusive, Line 3		828
11.	Common, Line 7		12,899
12.	Total Michigan Freight		13,727
13.	Michigan Passenger, Line 8	100.00	3,894
14.	Divided on Michigan Total Passenger Train Car Miles, Ratio No. 3:		
15.	Sleepers and Diners	28.13	1,095
16.	Mail and Express	14.68	572
17.	Passengers and Baggage	57.19	2,227
18.	Michigan Passengers and Baggage, Line 17	100.00	2,227
19.	Divided on Michigan Passenger Miles, Ratio No. 10:		
20.	Interstate	29.33	653
21.	Intrastate	70.67	1,574

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 208, Bridges on Exclusive Freight Track.

MICHIGAN.

	Our Distribution	D.S.S.&A. Distribution
	$	$
Dollarville Branch	240.67	240.67
Walsh Siding	117.99	
School House Track (Marquette)	6.70	6.70
Gaines (Marquette)	95.46	95.46
Lake Street Branch	2.25	2.25
Quarry Branch	11.30	
Dead River Branch	12.30	
Negaunee-Palmer Branch	5.78	5.78
Ohio Mine Branch	3.27	3.27
Beaufort Branch	23.09	23.09
Keeler Siding	2.92	
Holt Branch	8.75	8.75
Exclusive Freight Track	530.48	385.97
Add on account of structures under Common and Freight for Freight proportions	297.25	
TOTAL	827.73	385.97

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 212, Ties.

		%	$
1.	System Total, per Annual Report, $78,794; allocated to Michigan by Delf	100.00	60,334
2.	Divided on Mich. Equated Track Miles, Ratio No. 2:		
3.	Freight	17.28	10,426
4.	Common Freight and Passenger	82.52	49,787
5.	Passenger	.20	121
6.	Michigan Common, Line 4	100.00	49,787
7.	Divided on Mich. Total Gross Ton Miles, Ratio No. 1:		
8.	Freight	74.02	36,852
9.	Passenger	25.98	12,935
10.	Michigan Freight Recap.:		
11.	Exclusive, Line 3		10,426
12.	Common, Line 8		36,852
13.	Total Michigan Freight		47,278
14.	Michigan Passenger Recap.:		
15.	Exclusive, Line 5		121
16.	Common, Line 9		12,935
17.	Total Michigan Passenger		13,056
18.	Michigan Passenger, Line 17	100.00	13,056
19.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1 a:		
20.	Sleepers and Diners	38.02	4,964
21.	Mail and Express	14.07	1,837
22.	Passengers and Baggage	47.91	6,255
23.	Michigan Passengers and Baggage, Line 22	100.00	6,255
24.	Divided on Michigan Passenger Miles, Ratio No. 10:		
25.	Interstate	29.33	1,835
26.	Intrastate	70.67	4,420

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1917.

No. 214, Rails.

		%	$
1.	System Total, per Annual Report, $35,448; allocated to Michigan by Delf.	100.00	34,075
2.	Divided on Michigan Equated Track Miles, Ratio No. 2		
3.	Freight	17.28	5,888
4.	Common Freight and Passenger	82.52	28,119
5.	Passenger	.20	68
6.	Michigan Common, Line 4	$100.00	28,119
7.	Divided on Michigan Total Gross Ton Miles, Ratio No. 1		
8.	Freight	74.02	20,814
9.	Passenger	25.98	7,305
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		5,888
12.	Common, Line 8		20,814
13.	Total Michigan Freight		26,702
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		68
16.	Common, Line 9		7,305
17.	Total Michigan Passenger		7,373
18.	Michigan Passenger, Line 17	100.00	7,373
19.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1 a		
20.	Sleepers and Diners	38.02	2,803
21.	Mail and Express	14.07	1,037
22.	Passengers and Baggage	47.91	3,533
23.	Michigan Passengers and Baggage, Line 22	100.00	3,533
24.	Divided on Michigan Passenger Miles, Ratio No. 10		
25.	Interstate	29.33	1,036
26.	Intrastate	70.67	2,497

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1917.

No. 216, Other Track Material.

		%	$
1.	System Total, per Annual Report, $36,880; allocated to Michigan by Delf.	100.00	30,616
2.	Divided on Michigan Equated Track Miles, Ratio No. 2		
3.	Freight	17.28	5,291
4.	Common Freight and Passenger	82.52	25,264
5.	Passenger	.20	61
6.	Michigan Common, Line 4	100.00	25,264
7.	Divided on Michigan Total Gross Ton Miles, Ratio No. 1		
8.	Freight	74.02	18,700
9.	Passenger	25.98	6,564
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		5,291
12.	Common, Line 8		18,700
13.	Total Michigan Freight		23,991
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		61
16.	Common, Line 9		6,564
17.	Total Michigan Passenger		6,625
18.	Michigan Passenger, Line 17	100.00	6,625
19.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1 a		
20.	Sleepers and Diners	38.02	2,519
21.	Mail and Express	14.07	932
22.	Passengers and Baggage	47.91	3,174
23.	Michigan Passengers and Baggage, Line 22	100.00	3,174
24.	Divided on Michigan Passenger Miles, Ratio No. 10		
25.	Interstate	29.33	931
26.	Intrastate	70.67	2,243

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1917.

No. 218. Ballast.

		%	$
1.	System Total, per Annual Report, $15,694; allocated to Michigan by Delf.	100.00	14,838
2.	Divided on Michigan Equated Track Miles, Ratio No. 2		
3.	Freight	17.28	2,564
4.	Common Freight and Passenger	82.52	12,244
5.	Passenger	.20	30
6.	Michigan Common, Line 4	100.00	12,244
7.	Divided on Michigan Total Gross Ton Miles, Ratio No. 1		
8.	Freight	74.02	9,063
9.	Passenger	25.98	3,181
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		2,564
12.	Common, Line 8		9,063
13.	Total Michigan Freight		11,627
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		30
16.	Common, Line 9		3,181
17.	Total Michigan Passenger		3,211
18.	Michigan Passenger, Line 17	100.00	3,211
19.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1 a		
20.	Sleepers and Diners	38.02	1,221
21.	Mail and Express	14.07	452
22.	Passengers and Baggage	47.91	1,538
23.	Michigan Passengers and Baggage, Line 22	100.00	1,538
24.	Divided on Michigan Passenger Miles, Ratio No. 10.		
25.	Interstate	29.33	451
26.	Intrastate	70.67	1,087

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 220, Track Laying and Surfacing.

		%	$
1.	System Total, per Annual Report, $264,791; allocated to Michigan by Delf.		218,853
2.	Subdivided into sub-primary accounts.		
3.	Applying Ballast		19,876
4.	Applying Ties		40,224
5.	Applying Rails		19,839
6.	Applying Other Track Material		3,218
7.	Track Maintenance		128,324
8.	Track Changes		769
9.	Train Service		6,603
10.	Michigan Total, Line 1	100.00	218,853
11.	Divided on Michigan Equated Track Miles, Ratio No. 2.		
12.	Freight	17.28	37,818
13.	Common Freight and Passenger	82.52	180,597
14.	Passenger	.20	438
15.	Michigan Common, Line 13	100.00	180,597
16.	Divided on Michigan Total Gross Ton miles, Ratio No. 1		
17.	Freight	74.02	133,678
18.	Passenger	25.98	46,919
19.	Michigan Freight Recap:		
20.	Exclusive, Line 12		37,818
21.	Common, Line 17		133,678
22.	Total Michigan Freight		171,496

No. 220, Track Laying and Surfacing (Continued).

		%	$
23.	Michigan Passenger Recap:		
24.	Exclusive, Line 14		438
25.	Common, Line 18		46,919
26.	Total Michigan Passenger		47,357
27.	Michigan Passenger, Line 26	100.00	47,357
28.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1 a.		
29.	Sleepers and Diners	38.02	18,005
30.	Mail and Express	14.07	6,663
31.	Passengers and Baggage	47.91	22,689
32.	Michigan Passengers and Baggage, Line 31	100.00	22,689
33.	Divided on Michigan Passenger Miles, Ratio No. 10.		
34.	Interstate	29.33	6,655
35.	Intrastate	70.67	16,034

NOTE.—This account corresponds with Group A of Account No. 6 under the old classification.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1917.

No. 221, Right-of-Way Fences.

		%	$
1.	System Total, per Annual Report, $7,515; allocated to Michigan by Delf.	100.00	5,799
2.	Divided on Michigan Equated Track Miles, Ratio No. 2		
3.	Freight	17.28	1,002
4.	Common Freight and Passenger	82.52	4,785
5	Passenger	.20	12
6.	Michigan Common, Line 4	100.00	4,785
7.	Divided on Michigan Time, Ratio No. 4		
8.	Freight	76.81	3,675
9.	Passenger	23.19	1,110
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		1,002
12.	Common, Line 8		3,675
13.	Total Michigan Freight		4,677
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		12
16.	Common, Line 9		1,110
17.	Total Michigan Passenger		1,122
18.	Michigan Passenger, Line 17	100.00	1,122
19.	Divided on Michigan Total Passenger Train Cars Miles, Ratio No. 3.		
20.	Sleepers and Diners	28.13	316
21	Mail and Express	14.68	165
22.	Passengers and Baggage	57.19	641
23.	Michigan Passengers and Baggage, Line 22	100.00	641
24.	Divided on Michian Passenger Miles, Ratio No. 10.		
25	Interstate	29.33	188
26.	Intrastate	70.67	453

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1917.

No. 223, Snow and Sand Fences and Snowsheds.

		%	$
1.	System Total, per Annual Report, $796; allocated to Michigan by Delf.	100.00	757
2.	Divided on Michigan Equated Track Miles, Ratio No. 2.		
3.	Freight	17.28	131
4.	Common Freight and Passenger	82.52	625
5.	Passenger	.20	1
6.	Michigan Common, Line 4	100.00	625
7.	Divided on Michigan Time, Ratio No. 4		
8	Freight	76.81	480
9.	Passenger	23.19	145
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		131
12.	Common, Line 8		480
13.	Total Michigan Freight		611
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		1
16.	Common, Line 9		145
17.	Total Michigan Passenger		146
18.	Michigan Passenger, Line 17	100.00	146
19.	Divided on Michigan Total Passenger Train Car Miles, Ratio No. 3.		
20.	Sleepers and Diners	28.13	41
21.	Mail and Express	14.68	21
22.	Passengers and Baggage	57.19	84
23.	Michigan Passengers and Baggage, Line 22	100.00	84
24.	Divided on Michigan Passenger Miles,		
25.	Interstate	29.33	25
26.	Intrastate	70.67	59

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1917.

No. 225, Crossings and Signs.

		%	$
1.	System Total, per Annual Report, $2.911; allocated to Michigan by Delf.	100.00	2,583
2.	Divided on Michigan Equated Track Miles, Ratio No. 2.		
3.	Freight	17.28	447
4.	Common Freight and Passenger	82.52	2,131
5.	Passenger	.20	5
6.	Michigan Common, Line 4	100.00	2,131
7.	Divided on Michigan Time, Ratio No. 4		
8.	Freight	76.81	1,637
9.	Passenger	23.19	494
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		447
12.	Common, Line 8		1,637
13.	Total Michigan Freight		2,084
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		5
16.	Common, Line 9		494
17.	Total Michigan Passenger		499
18.	Michigan Passenger, Line 17	100.00	499
19.	Divided on Michigan Total Passenger Train Cars Miles, Ratio No. 3.		
20.	Sleepers and Diners	28.13	140
21.	Mail and Express	14.68	73
22.	Passengers and Baggage	57.19	286
23.	Michigan Passengers and Baggage, Line 22	100.00	286
24.	Divided on Michigan Passenger Miles,		
25.	Interstate	29.33	84
26.	Intrastate	70.67	202

NOTE:—Of the Michigan portion of this charge, Delf allocated directly to Freight $872.74.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 227—Station and Office Buildings.

			%	$
1.	System Total, per Annual Report			12,750
2.	Allocated to Stations and General Offices.			
3.	Stations			12,571
4.	General Offices (Common Freight and Passenger)			179
5.	System Stations, Line 3, $12,571; allocated to Michigan			11,754
6.	Allocated to Services.			
7.	Track Scales (All Freight)			3,841
8.	Other Freight			1,787
9.	Common Freight and Passenger			4,362
10.	Passenger			1,764
11.	Michigan Common Stations, Line 9		100.00	4,362
12.	Divided on Station Payroll, Ratio No. 17.			
13.	Freight		87.42	3,813
14.	Passenger		12.58	549
15.	System Common General Offices, Line 4		100.00	179
16.	Divided relatively with the total of charges to Michigan (excluding Mineral Range) and outside of Michigan in General Account No. IV, "Transportation"	$1,550,595		
17.	Outside Michigan	245,902	15.86	28
18.	Michigan	1,304,693	84.14	151
19.	Michigan Common General Offices, Line 18		100.00	151
20.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Account No. IV, "Transportation"	$1,304,693		
21.	Freight	972,485	74.54	113
22.	Passenger	332,208	25.46	38

No. 227—Station and Office Buildings (Continued).

			%	$
23.	Michigan Freight Recap:			
24.	Track Scales, Line 7			3,841
25.	Other Exclusive, Line 8			1,787
26.	Common Stations, Line 13			3,813
27.	Common General Offices, Line 21			113
28.	Total Michigan Freight			9,554
29.	Michigan Passenger Recap:			
30.	Exclusive, Line 10			1,764
31.	Common Stations, Line 14			549
32.	Common General Office, Line 22			38
33.	Total Michigan Freight			2,351
34.	Michigan Passenger, Line 33		100.00	2,351
35.	Divided relatively with the charges to Michigan Passenger Services in Account No. 373	$21,989		
36.	Mail and Express	2,199	10.00	235
37.	Passengers and Baggage	19,790	90.00	2,116
38.	Michigan Passengers and Baggage, Line 37		100.00	2,116
39.	Divided on Michigan Passenger, Miles, Ratio No. 10.			
40.	Interstate		29.33	621
41.	Intrastate		70.67	1,495

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 229—Roadway Buildings.

		%	$
1.	System Total, per Annual Report, $6,363; allocated to Michigan by Delf	100.00	6,197
2.	Divided on Michigan Equated Track, Miles, Ratio No. 2.		
3.	Freight	17.28	1,071
4.	Common Freight and Passenger	82.52	5,114
5.	Passenger	.20	12
6.	Michigan Common, Line 4	100.00	5,114
7.	Divided on Michigan Total Gross Ton Miles, Ratio No. 1.		
8.	Freight	74.02	3,785
9.	Passenger	25.98	1,329
10.	Michigan Freight Recap:		
11.	Exclusive, Line 3		1,071
12.	Common, Line 8		3,785
13	Total Michigan Freight		4,856
14.	Michigan Passenger Recap:		
15.	Exclusive, Line 5		12
16.	Common, Line 9		1,329
17.	Total Michigan Passenger		1,341
18.	Michigan Passenger, Line 17	100.00	1,341
19.	Divided on Michigan Passenger Gross Ton Miles, Ratio No 1a.		
20.	Sleepers and Diners	38.02	510
21.	Mail and Express	14.07	189
22.	Passengers and Baggage	47.91	642
23.	Michigan Passengers and Bagage, Line 22	100.00	642
24.	Divided on Michigan Passenger Miles, Ratio No. 10.		
25.	Interstate	29.33	188
26.	Intrastate	70.67	454

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 231—Water Stations.

No. 233—Fuel Stations.

				No.231	No.233
			%	$	$
1.	System Total, per Annual Report		100.00	6,834	8,542
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 382 and 394.	$484,713			
3.	Outside Michigan	75.503	15.58	1,065	1,331
4.	Michigan	409,210	84.42	5,769	7,211
5.	Michigan Total, Line 4		100.00	5,769	7,211
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 382 and 394	$402,922			
7.	Freight	287,856	71.44	4,121	5,152
8.	Passenger	115,066	28.56	1,648	2,059
9.	Michigan Passenger, Line 8		100.00	1,648	2,059
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 382 and 394	$115,066			
11.	Sleepers and Diners	44,607	38.77	639	798
12.	Mail and Express	16,236	14.11	233	291
13.	Passengers and Baggage	54,223	47.12	776	970
14.	Michigan Passengers and Baggage, Line 13		100.00	776	970
15.	Divided on Michigan Passenger Miles, Ratio No. 10.				
16.	Interstate		29.33	228	285
17.	Intrastate		70.67	548	685

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 235—Shops and Enginehouses.

				$
1.	System Total, per Annual Report			7,620
2.	Allocated to Shops and Enginehouses.			
3.	Marquette and General Shops			1,330
4.	Enginehouses, Superior and Iron River		$ 172	
5.	Republic		3	
6.	Soo		548	
7.	Soo Junction		298	
8.	St. Ignace		237	
9.	Marquette		1,108	
10.	South Ishpeming		185	
11.	Michigamme		2,620	
12.	L'Anse		31	
13.	Houghton		245	
14.	Thomaston		843	
15.	Total Enginehouses			6,290
			%	
16.	System Total Shops, Line 3		100.00	1,330
17.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$352,572		
18.	Outside Michigan	55,028	15.61	208
19.	Michigan	297,544	84.39	1,122
20.	Michigan Total Shops, Line 19		100.00	1,122
21.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$293,835		
22.	Freight	212,532	72.33	812
23.	Passenger	81,303	27.67	310

No. 235—Shops and Enginehouses (Continued)

			%	$
24.	Michigan Passenger, Line 23		100.00	310
25.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$ 81,303		
26.	Sleepers and Diners	23,142	28.46	88
27.	Mail and Express	13,855	17.04	53
28	Passengers and Baggage	44,306	54.50	169
29.	System Total Enginehouses, Line 15		100.00	6,290
30.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 388 and 400	$ 74,743		
31.	Outside Michigan	8,460	11.32	712
32.	Michigan	66,283	88.68	5,578
33.	Michigan Total Enginehouses, Line 32		100.00	5,578
34.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 388 and 400	$ 66,283		
35.	Freight	47,543	71.73	4,001
36.	Passenger	18,740	28.27	1,577
37.	Michigan Passenger Enginehouses, Line 36		100.00	1,577
38.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 388 and 400	$ 18,740		
39.	Sleepers and Diners	7,299	38.95	614
40.	Mail and Express	2,622	13.99	221
41.	Passengers and Baggage	8,819	47.06	742
42.	Michigan Freight Recap:			
43	Shops, Line 22			812
44.	Enginehouses, Line 35			4,001
45.	Total Michigan Freight			4,813

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 235—Shops and Enginehouses (Continued).

		%	$
46.	Michigan Passenger Recap:		
47.	Shops, Line 23		310
48.	Enginehouses, Line 36		1,577
49.	Total Michigan Passenger		1,887
50.	Michigan Sleepers and Diners Recap:		
51.	Shops, Line 26		88
52.	Enginehouses, Line 39		614
53.	Total Michigan Sleepers and Diners		702
54.	Michigan Mail and Express Recap:		
55.	Shops, Line 27		53
56.	Enginehouses, Line 40		221
57.	Total Michigan Mail and Express		274
58.	Michigan Passengers and Baggage Recap:		
59.	Shops, Line 28		169
60.	Enginehouses, Line 41		742
61.	Total Michigan Passengers and Baggage		911
62.	Michigan Passengers and Baggage, Line 61	100.00	911
63.	Divided on Michigan Passenger Miles, Ratio No. 10.		
64.	Interstate	29.33	267
65.	Intrastate	70.67	644

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 241—Wharves and Docks.

		%	$
1.	System Total, per Annual Report, $2,878; allocated to Michigan by Delf		2,878
2.	Allocated to Docks by Delf.		
3.	St. Ignace Mdse. Dock (all Freight)		638
4.	St. Ignace Slip Dock		1,415
5.	St. Ignace Foot Bridge (all Passenger)		825
6.	St. Ignace Slip Dock, Line 4	100.00	1,415
7.	Divided on basis arrived at by Delf. (a)		
8.	Freight	79.63	1,127
9.	Passenger	20.37	288
10.	Michigan Freight Recap.:		
11.	St. Ignace Mdse. Dock, Line 3		638
12.	St. Ignace Slip Dock, Line 8		1,127
13.	Total Michigan Freight		1,765
14.	Michigan Passenger Recap.:		
15.	St. Ignace Foot Bridge, Line 5		825
16.	St. Ignace Slip Dock, Line 9		288
17.	Total Michigan Passenger		1,113
18.	Michigan Passenger, Line 17	100.00	1,113
19.	Divided on basis of Passenger Cars over St. Ignace Slip Dock.		
20.	Sleepers and Diners	33.09	368
21.	Mail and Express	12.94	144
22.	Passengers and Baggage	53.97	601
23.	Michigan Passengers and Baggage, Line 22	100.00	601
24.	Divided on Michigan Passenger Miles, Ratio No. 10.		
25.	Interstate	29.33	176
26.	Intrastate	70.67	425

(a)

	Cars Over Slip Dock		
Class	Total	Equated	Percent
Freight	57,761	57,761	79.63
Passenger	7,388×2	14,776	20.37
	65,149	72,537	100.00

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 243—Coal and Ore Wharves.

	$
1. System Total, per Annual Report, $17,285; allocated to Michigan by Delf.	17,285

All Freight.

No. 244—Coal and Ore Wharves—Depreciation.

	$
1. System Total, per Annual Report, $19,146; allocated to Michigan by Delf.	19,146

All Freight.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 247—Telegraph and Telephone Lines.

			%	$
1.	System Total, per Annual Report		100.00	6,053
2.	Divided on System Time, Ratio No. 4a.			
3.	Freight		79.48	4,811
4.	Passenger		20.52	1,242
5.	System Freight, Line 3		100.00	4,811
6.	Divided relatively with the total Mileage of Freight Trains (including proportion of Mixed and Special) plus Train and Yard Switching in and outside of Michigan	$1,503,587		
7.	Outside Michigan	219,606	14.61	703
8.	Michigan	1,283,981	85.39	4,108
9.	System Passenger, Line 4		100.00	1,242
10.	Divided relatively with the Total Mileage of Passenger Trains (including C. & N. W. and C. M. & St. P. operations into Marquette and proportion of Mixed and Special) plus Train and Yard Switching in and outside of Michigan	$951,427		
11.	Outside Michigan	158,178	16.63	207
12.	Michigan	793,249	83.37	1,035
13.	Michigan Passenger, Line 12		100.00	1,035
14.	Divided on Michigan Total Passenger Train Car miles, Ratio No. 3.			
15.	Sleepers and Diners		28.13	291
16.	Mail and Express		14.68	152
17.	Passengers and Baggage		57.19	592
18.	Michigan Passengers and Baggage, Line 17		100.00	592
19.	Divided on Michigan Passenger miles, Ratio No. 10.			
20.	Interstate		29.33	174
21.	Intrastate		70.67	418

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 249—Signals and Interlockers.

		%	$
1.	System Total, per Annual Report, $1,382; allocated to Michigan by Delf.	100.00	687
2.	Divided on same Basis as Account No. 404.		
3.	Freight	94.76	651
4.	Passenger	5.24	36
5.	Michigan Passenger, Line 4	100.00	36
6.	Divided on Michigan Passenger train Car Miles, Ratio No. 3.		
7.	Sleepers and Diners	28.13	10
8.	Mail and Express	14.68	5
9.	Passengers and Baggage	57.19	21
10.	Michigan Passengers and Baggage, Line 9	100.00	21
11.	Divided on Michigan Passenger Miles, Ratio No. 10.		
12.	Interstate	29.33	6
13.	Intrastate	70.67	15

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 265—Miscellaneous Structures.

			%	$
1.	System Total, per Annual Report			58
2.	Allocated to States.			
3.	Common Michigan and Outside Michigan (Stationery Building, etc., Marquette)			40
4.	Michigan Freight			7
5.	Michigan Common Freight and Passenger			11
6.	Common Michigan and Outside Michigan, Line 3		100.00	40
7.	Divided relatively with the total of charges to Michigan (excluding Mineral Range) and Outside of Michigan in General Account No. IV, "Transportation"	$1,550,595		
8.	Outside Michigan	245,902	15.86	6
9.	Michigan (Common Freight and Passenger)	1,304,693	84.14	34
10.	Michigan Common Freight and Passenger Recap.:			
11.	Direct Michigan, Line 5			11
12.	Common Michigan, Line 9			34
13.	Total Michigan Common Freight and Passenger			45
14.	Michigan Common, Line 13		100.00	45
15.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Account No. IV, "Transportation"	$1,304,693		
16.	Freight	972,485	74.54	34
17.	Passenger	332,208	25.46	11
18.	Michigan Freight Recap.:			
19.	Exclusive, Line 4			7
20.	Common, Line 16			34
21.	Total Michigan Freight			41

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 265—Miscellaneous Structures. (Continued)

			%	$
22.	Michigan Passenger, Line 17		100.00	11
23.	Divided relatively with the total of charges to Michigan Passenger Services in General Account to No. IV "Transportation"	$332,208		
24.	Sleepers and Diners	111,252	33.49	4
25.	Mail and Express	40,984	12.34	1
26.	Passengers and Baggage	179,972	54.17	6
27.	Michigan Passengers and Baggage, Line 26		100.00	6
28.	Divided on Michigan Passenger Miles, Ratio No. 10.			
29.	Interstate		29.33	2
30.	Intrastate		70.67	4

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 269—Roadway Machines.

			%	$
1.	System Total, per Annual Report, $2,216; allocated to Michigan by Delf		100.00	1,993
2.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$545,995		
3.	Freight	433,485	79.39	1,582
4.	Passenger	112,510	20.61	411
5.	Michigan Passenger, Line 4		100.00	411
6.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$112,510		
7.	Sleepers and Diners	39,417	35.03	144
8.	Mail and Express	15,881	14.12	58
9.	Passengers and Baggage	57,212	50.85	209
10.	Michigan Passengers and Baggage, Line 9		100.00	209
11.	Divided on Michigan Passenger Miles, Ratio No. 10			
12.	Interstate		29.33	61
13.	Intrastate		70.67	148

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 271—Small Tools and Supplies.

			%	$
1.	System Total, per Annual Report, $9,223; allocated to Michigan by Delf		100.00	7,767
2.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$545,995		
3.	Freight	433,485	79.39	6,166
4.	Passenger	112,510	20.61	1,601
5	Michigan Passenger, Line 4		100.00	1,601
6.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$112,510		
7.	Sleepers and Diners	39,417	35.03	56
8.	Mail and Express	15,881	14.12	22
9.	Passengers and Baggage	57,212	50.85	81
10.	Michigan Passengers and Baggage, Line 9		100.00	81
11.	Divided on Michigan Passenger Miles, Ratio No. 10.			
12.	Interstate		29.33	23
13.	Intrastate		70.67	57

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 272—Removing Snow, Ice and Sand.

		%	$
1.	System Total, per Annual Report, $49,937; allocated to Michigan by Delf	100.00	45,184
2.	Divided to Services, by agreement.		
3.	Freight	29.00	13,103
4.	Common Freight and Passenger	70.00	31,629
5.	Passenger	1.00	452
6.	Michigan Common, Line 4	100.00	31,629
7.	Divided on Michigan Time, Ratio No. 4		
8.	Freight	76.81	24,294
9.	Passenger	23.19	7,335
10.	Michigan Freight Recap.:		
11.	Exclusive, Line 3		13,103
12.	Common, Line 8		24,294
13.	Total Michigan Freight		37,397
14.	Michigan Passenger Recap.:		
15.	Exclusive, Line 5		452
16.	Common, Line, 9		7,335
17.	Total Michigan Passenger		7,787
18.	Michigan Passenger, Line 17	100.00	7,787
19.	Divided on Michigan Total Passenger train Car Miles, Ratio No. 3.		
20.	Sleepers and Diners	23.13	2,190
21.	Mail and Express	14.68	1,143
22.	Passengers and Baggage	57.19	4,454
23.	Michigan Passengers and Baggage, Line 22	100.00	4,454
24.	Divided on Michigan Passenger Miles, Ratio No. 10		
25.	Interstate	29.33	1,306
26.	Intrastate	70.67	3,148

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 274—Injuries to Persons.

			%	$
1.	System Total, per Annual Report, $2,472; allocated to Michigan by Delf.			2,202
2.	Allocated to Services by Delf.			
3.	Freight			174
4.	Common Freight and Passenger			2,028
5.	Michigan Common, Line 4		100.00	2,028
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$545,995		
7.	Freight	433,485	79.39	1,610
8.	Passenger	112,510	20.61	418
9.	Michigan Freight Recap.:			
10.	Exclusive, Line 3			174
11.	Common, Line 7			1,610
12.	Total Michigan Freight			1,784
13.	Michigan Passenger, Line 8		100.00	418
14.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$112,510		
15.	Sleepers and Diners	39,417	35.03	146
16.	Mail and Express	15,881	14.12	59
17.	Passengers and Baggage	57,212	50.85	213
18.	Michigan Passengers and Baggage, Line 17		100.00	213
19.	Divided on Michigan Passenger Miles, Ratio No. 10.			
20.	Interstate		29.33	62
21.	Intrastate		70.67	151

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 275—Insurance.

			%	$
1.	System Total, per Annual Report, $4,235; allocated to Michigan			2,775
2.	Allocated to Services.			
3.	Freight			341
4.	Common Freight and Passenger			2,306
5.	Passenger			128
6.	Michigan Common, Line 4		100.00	2,306
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$545,995		
8.	Freight	433,485	79.39	1,831
9.	Passenger	112,510	20.61	475
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			341
12.	Common, Line 8			1,831
13.	Total Michigan Freight			2,172
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			128
16.	Common, Line 9			475
17.	Total Michigan Passenger			603
18.	Michigan Passenger, Line 17		100.00	603
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$112,510		
20.	Sleepers and Diners	39,417	35.03	211
21.	Mail and Express	15,881	14.12	85
22.	Passengers and Baggage	57,212	50.85	307

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 275.—Insurance—Continued.

		%	$
23.	Michigan Passengers and Baggage, Line 22	100.00	307
24.	Divided on Michigan Passenger Miles, Ratio No. 10.		
25.	Interstate	29.33	90
26.	Intrastate	70.67	217

Note.—Delf divides the Michigan Common portion of this charge as follows:

Station and Roadway Buildings	$518.34
Enginehouses	389.14
Shops, etc., Marquette	294.40
Shops, etc., Other	11.32
Tanks and Pumphouses	302.60
Bridges, Trestles and Culverts	628.44
Coal Trestles, etc.	205.86
Work Equipment	.64
Total	$2,350.74

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 276—Stationery and Printing.

			%	$
1.	System Total, per Annual Report		100.00	972
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 202 and 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$685,906		
3.	Outside Michigan	139,911	20.40	198
4.	Michigan	545,995	79.60	774
5.	Michigan Total, Line 4		100.00	774
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$545,995		
7.	Freight	433,485	79.39	614
8.	Passenger	112,510	20.61	160
9.	Michigan Passenger, Line 8		100.00	160
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$112,510		
11.	Sleepers and Diners	39,417	35.03	56
12.	Mail and Express	15,881	14.12	23
13.	Passengers and Baggage	57,212	50.85	81
14.	Michigan Passengers and Baggage, Line 13		100.00	81
15.	Divided on Michigan Passenger Miles, Ratio No. 10			
16.	Interstate		29.33	24
17.	Intrastate		70.67	57

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 277—Other Expenses.

			%	$
1.	System Total, per Annual Report			130
2.	Allocated to States.			
3.	Outside Michigan			3
4.	Common Michigan and Outside Michigan			40
5.	Michigan			87
6.	Common Michigan and Outside Michigan, Line 4		100.00	40
7.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$685,906		
8.	Outside Michigan	139,911	20.40	8
9.	Michigan	545,995	79.60	32
10.	Michigan Total Recap.:			
11.	Exclusive, Line 5			87
12.	Common, Line 9			32
13.	Total Michigan			119
14.	Michigan Total, Line 13		100.00	119
15.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$545,995		
16.	Freight	433,485	79.39	94
17.	Passenger	112,510	20.61	25
18.	Michigan Passenger, Line 17		100.00	25
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$112,510		
20.	Sleepers and Diners	39,417	35.03	9
21.	Mail and Express	15,881	14.12	3
22.	Passengers and Baggage	57,212	50.85	13

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 277—Other Expenses (Continued).

23.	Michigan Passengers and Baggage, Line 22	100.00	13
24.	Divided on Michigan Passenger Miles, Ratio No. 10.		
25.	Interstate	29.33	4
26.	Intrastate	70.67	9

No. 278—Maintaining Joint Tracks, Yards and Other Facilities—Dr.

			%	$
1.	System Total, per Annual Report, $8,903; allocated to Michigan by Delf			7,259
2.	Allocated to Services by Delf.			
3.	Freight			6,330
4.	Common Freight and Passenger			112
5.	Passenger			817
6.	Michigan Common, Line 4		100.00	112
7.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$545,995		
8.	Freight	433,485	79.39	89
9.	Passenger	112,510	20.61	23
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			6,330
12.	Common, Line 8			89
13.	Total Michigan Freight			6,419
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			817
16.	Common, Line 9			23
17.	Total Michigan Passenger			840

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 278—Maintaining Joint Tracks, Yards and Other Facilities—Dr. (Continued).

			%	$
18.	Michigan Passenger, Line 17			840
19.	Allocated to Interstate Passengers and Baggage, account of Soo Bridge			6
20.	Balance			834
21.	Michigan Passenger other than Soo Bridge, Line 20		100.00	834
22.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)	$112,510		
23.	Sleepers and Diners	39,417	35.03	292
24.	Mail and Express	15,881	14.12	118
25.	Passengers and Baggage	57,212	50.85	424
26.	Michigan Passengers and Baggage other than Soo Bridge, Line 25		100.00	424
27.	Divided on Michigan Passenger Miles, Ratio No. 10.			
28.	Interstate		29.33	124
29.	Intrastate		70.67	300
30.	Michigan Interstate Passengers and Baggage Recap.:			
31.	Soo Bridge, Line 19			6
32.	Other, Line 28			124
33.	Total Michigan Interstate Passengers and Baggage			130

NOTE—The Michigan Common is for Station Repairs at Trout Lake, Munising Junction and Sidnaw.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 279—Maintaining Joint Tracks, Yards and Other Facilities—Cr.

				%	$
1.	System Total, per Annual Report, $16,373*; allocated to Michigan				*16,214
2.	Allocated to Services (see following page).				
3.		Freight			* 7,100
4.		Common Freight and Passenger			* 5,092
5.		Passenger			* 4,022
6.	Michigan Common, Line 4			100.00	* 5,092
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)		$545,995		
8.		Freight	433,485	79.39	* 4,043
9.		Passenger	112,510	20.61	* 1,049
10.	Michigan Freight Recap.:				
11.		Exclusive, Line 3			* 7,100
12.		Common, Line 8			* 4,043
13.		Total Michigan Freight			*11,143
14.	Michigan Passenger Recap.:				
15.		Exclusive, Line 5			* 4,022
16.		Common, Line 9			* 1,049
17.		Total Michigan Passenger			* 5,071
18.	Michigan Passenger, Line 17			100.00	* 5,071
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 243 inclusive, 247, 249, 265 and 272 (see detail page following Account No. 201)		$112,510		
20.		Sleepers and Diners	39,417	35.03	* 1,776
21.		Mail and Express	15,881	14.12	* 716
22.		Passengers and Baggage	57,212	50.85	* 2,579
23.	Michigan Passengers and Baggage, Line 22			100.00	* 2,579
24.	Divided on Michigan Passenger Miles, Ratio No. 10.				
25.		Interstate		29.33	* 756
26.		Intrastate		70.67	* 1,823

*Typewritten figures in red.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Details of Account No. 279—Maintaining Joint Tracks, Yards and Other Facilities—Cr.

	Total	Passenger	Freight	Common
	$	$	$	$
Various Freight, direct	1,537.37		1,537.37	
Various Passenger, direct	108.92	108.92		
Mine Tracks	2,868.87		2,868.87	
Joint Tracks at Soo, outside Depot		19.07	2,648.49	1,576.66
Soo Roundhouse	282.56			282.56
Soo Scales	27.20		27.20	
Water Tanks—				
Michigamme & Keweenaw Bay	1,068.20			1,068.20
C. & N. W. Passenger Trains	2,525.33	2,525.33		
C. & N. W. Freight Trains	400.09			400.09
C. M. & St. P. Passenger Trains	1,368.75	1,368.75		
Mineral Range Freight Trains	813.04			813.04
Various Joint Stations	794.93			794.93
Insurance at Sault Ste. Marie	165.88		18.13	147.75
Errors in Bills	9.02			9.02
Totals	16,214.38	4,022.07	7,100.06	5,092.25

II. MAINTENANCE OF EQUIPMENT.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

II. MAINTENANCE OF EQUIPMENT.

No. 301—Superintendence.

			%	$
1.	System Total, per Annual Report		100.00	13,349
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 308, 314, 317 and 326 (see detail page following)	$352,572		
3.	Outside Michigan	55,028	15.61	2,084
4.	Michigan	297,544	84.39	11,265
5.	Michigan Total, Line 4		100.00	11,265
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 308, 314, 317 and 326 (see detail page following)	$297,544		
7.	Freight	212,532	71.43	8,047
8.	Passenger—M. R.	3,709	1.25	140
9.	Passenger—D. S. S. & A.	81,303	27.32	3,078
10.	Michigan D. S. S. & A. Passenger, Line 9		100.00	3,078
11.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 308, 314, 317 and 326 (see detail page following)	$ 81,303		
12.	Sleepers and Diners	23,142	28.46	876
13.	Mail and Express	13,855	17.04	524
14.	Passengers and Baggage	44,306	54.50	1,678
15.	Michigan Passengers and Baggage, Line 14		100.00	1,678
16.	Divided on Michigan Passenger Miles, Ratio No. 10.			
17.	Interstate		29.33	492
18.	Intrastate		70.67	1,186

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Details for Dividing Accounts 235, 301, 302, 332, 333, 334 and 337.

Acct. No.	System Total	Outside Michigan	MICHIGAN						
			Total	Freight	Mineral Range Passenger	D. S. S. & A. Passenger			
						Total	Sleepers and Diners	Mail and Express	Passengers and Baggage
	$	$	$	$	$	$	$	$	$
308	127,367	19,107	108,260	67,380	2,123	38,757	14,990	5,470	18,297
314	160,384	24,170	136,214	136,214					
317	50,613	8,769	41,854		1,586	40,268	7,341	8,061	24,866
326	14,208	2,992	11,216	8,938		2,278	811	324	1,143
	352,572	55,028	297,544	212,532	3,709	81,303	23,142	13,855	44,306

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 302—Shop Machinery.

			%	$
1.	System Total, per Annual Report		100.00	9,856
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$352,572		
3.	Outside Michigan	55,028	15.61	1,539
4.	Michigan	297,544	84.39	8,317
5.	Michigan Total, Line 4		100.00	8,317
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$293,835		
7.	Freight	212,532	72.33	6,016
8.	Passenger	81,303	27.67	2,301
9.	Michigan Passenger, Line 8		100.00	2,301
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$ 81,303		
11.	Sleepers and Diners	23,142	28.46	655
12.	Mail and Express	13,855	17.04	392
13.	Passengers and Baggage	44,306	54.50	1,254
14.	Michigan Passengers and Baggage, Line 13		100.00	1,254
15.	Divided on Michigan Passenger Miles, Ratio No. 10.			
16.	Interstate		27.33	368
17.	Intrastate		70.67	886

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 308—Steam Locomotives—Repairs.

			%	$
1.	System Total, per Annual Report			127,367
2.	Divided to Services by Delf.			
3.	Regular Freight			63,794
4	Mixed			463
5.	Yard Switching			14,746
6.	Regular Passenger (includes Special Passenger)			48,364
7.	System Regular Freight, Line 3		100.00	63,794
8.	Divided relatively with the total mileage of Regular Freight Train Locomotives in and outside of Michigan	1,282,941		
9.	Outside Michigan	209,749	16.35	10,430
10.	Michigan	1,073,192	83.65	53,364
11.	System Mixed, Line 4		100.00	463
12.	Divided relatively with the total mileage of Mixed Train Locomotives (including Special Mixed) in and outside of Michigan	18,579		
13.	Outside Michigan	64	.34	2
14.	Michigan	18,515	99.66	461
15.	Michigan Mixed, Line 14		100.00	461
16.	Divided relatively with the Michigan mileage of Freight and Pasenger Cars in all Mixed Trains.			
17.	Freight		84.97	392
18.	Passenger		15.03	69

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 308—Steam Locomotives—Repairs (Continued).

			%	$
19.	System Yard Switching, Line 5		100.00	14,746
20.	Divided relatively with the total Yard Swtching miles in and outside of Michigan	327,064		
21.	Outside Michigan	17,238	5.27	777
22.	Michigan	309,826	94.73	13,969
23.	Michigan Yard Switching, Line 22		100.00	13,969
24.	Divided on Michigan Total Yard Switching miles, Ratio No. 13a.			
25.	Freight		97.53	13,624
26.	Passenger		2.47	345
27.	System Regular Passenger, Line 6		100.00	48,364
28.	Divided relatively with the total mileage of D. S. S. & A. Passenger train locomotives (including Special Passenger) in and outside of Michigan and on M. R. and D. S. S. & A.	987,987		
29.	Outside Michigan	161,346	16.33	7,898
30.	Michigan—M. R.	43,410	4.39	2,123
31.	Michigan—D. S. S. & A.	783,231	79.28	38,343
32.	Michigan Regular D. S. S. & A. Passenger, Line 31		100.00	38,343
33.	Divided relatively with the Michigan Revenue and Train Switching miles of Passenger Train Locomotives (including Special Passenger)	783,231		
34.	Revenue	781,017	99.72	38,236
35.	Train Switching	2,214	.28	107

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 308—Steam Locomotives—Repairs (Continued).

		%	$
36.	Michigan Passenger Switching Recap:		
37.	Yard, Line 26		345
38.	Train, Line 35		107
39.	Total Michigan Passenger Switching		452
40.	Michigan Revenue Passenger Recap:		
41.	Mixed, Line 18		69
42.	Regular, Line 34		38,236
43.	Total Michigan Revenue Passenger		38,305
44.	Michigan Passenger Switching, Line 39	100.00	452
45.	Divided on Michigan Total Passenger Switching Miles, Ratio No. 13 c.		
46.	Sleepers and Diners	39.14	177
47.	Mail and Express	7.66	35
48.	Passengers and Baggage	53.20	240
49.	Michigan Revenue Passenger, Line 43	100.00	38,305
50.	Divided on Michigan Passenger Gross Ton miles, Ratio No. 1b.		
51.	Sleepers and Diners	38.67	14,813
52.	Mail and Express	14.19	5,435
53.	Passengers and Baggage	47.14	18,057
54.	Michigan Freight Recap:		
55.	Regular, Line 10		53,364
56.	Mixed, Line 17		392
57.	Yard Switching, Line 25		13,624
58.	Total Michigan Freight		67,380
59.	Michigan Passenger Recap:		
60.	Switching, Line 39		452
61.	Revenue, Line 43		38,305
62.	Total Michigan Passenger		38,757

No. 308—Steam Locomotives—Repairs (Continued).

		%	$
63.	Michigan Sleepers and Diners Recap:		
64.	Switching, Line 46		177
65.	Revenue, Line 51		14,813
66.	Total Michigan Sleepers and Diners		
67.	Michigan Mail and Express Recap:		
68.	Switching, Line 47		35
69.	Revenue, Line 52		5,435
70.	Total Michigan Mail and Express		5,470
71.	Michigan Pasengers and Baggage Recap:		
72.	Switching, Line 48		240
73.	Revenue, Line 53		18,057
74.	Total Michigan Passengers and Baggage		18,297
75.	Michigan Passengers and Baggage, Line 74	100.00	18,297
76.	Divided on Michigan Passenger Miles, Ratio No. 10.		
77.	Interstate	29.33	5,367
78.	Intrastate	70.67	12,930

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 309—Steam Locomotives—Depreciation.

			%	$
1.	System Total, per Annual Report			22,413
2.	Divided to Services by Delf.			
3.	Freight			11,532
4.	Yard Switching			3,295
5.	Work			638
6.	Passenger			6,948
7.	System Freight, Line 3		100.00	11,532
8.	Divided relatively with the total mileage of Freight Train Locomotives (including proportion of Mixed and Special) in and outside of Michigan	1,298,715		
9.	Outside Michigan	209,788	16.15	1,862
10.	Michigan	1,088,927	83.85	9,670
11.	System Yard Switching, Line 4		100.00	3,295
12.	Divided relatively with the total Yard Switching Miles in and outside of Michigan	327,064		
13.	Outside Michigan	17,238	5.27	.174
14.	Michigan	309,826	94.73	3,121
15.	Michigan Yard Switching, Line 14		100.00	3,121
16.	Divided on Michigan Total Yard Switching Miles, Ratio No. 13a.			
17.	Freight		97.53	3,044
18.	Passenger		2.47	77
19.	Michigan Passenger, Line 18		100.00	77
20.	Divided on Michigan Passenger Yard Switching Miles, Ratio No. 13b.			
21.	Sleepers and Diners		50.44	39
22.	Mail and Express		5.06	4
23.	Passengers and Baggage		44.50	34

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 309—Steam Locomotives—Depreciation (Continued).

			%	$
24.	System Work, Line 5		100.00	638
25.	Divided relatively with the charges to Michigan and outside of Michigan in Account No. 326	$ 14,208		
26.	Outside Michigan	2,992	21.06	134
27.	Michigan	11,216	78.94	504
28.	Michigan Work, Line 27		100.00	504
29.	Divided relatively with the charges to Michigan Freight and Passenger in Account No. 326	$ 11,216		
30.	Freight	8,938	79.69	402
31.	Passenger	2,278	20.31	102
32.	Michigan Passenger, Line 31		100.00	102
33.	Divided relatively with the charges to Michigan Passenger Services in Account No. 326	$ 2,278		
34.	Sleepers and Diners	811	35.62	36
35.	Mail and Express	324	14.20	15
36.	Passengers and Baggage	1,143	50.18	51
37.	System Passenger, Line 6		100.00	6,948
38.	Divided relatively with the total mileage of D. S. S. & A. Passenger Train Locomotives (including proportion of Mixed and Special) in and outside of Michigan and on M.R. and D.S.S.& A.	990,792		
39.	Outside Michigan	161,371	16.29	1,132
40.	Michigan—M. R.	43,410	4.38	304
41.	Michigan—D. S. S. & A.	786,011	79.33	5,512
42.	Michigan Regular D. S. S. & A. Passenger, Line 41		100.00	5,512
43.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1b.			
44.	Sleepers and Diners		38.67	2,132
45.	Mail and Express		14.19	782
46.	Passengers and Baggage		47.14	2,598

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 309—Steam Locomotives—Depreciation (Continued).

		%	$
47.	Michigan Freight Recap:		
48.	Exclusive, Line 10		9,670
49.	Yard Switching, Line 17		3,044
50.	Work, Line 30		402
51.	Total Michigan Freight		13,116
52.	Michigan Passenger Recap:		
53.	Yard Switching, Line 18		77
54.	Work, Line 31		102
55.	Exclusive, Line 41		5,512
56.	Total Michigan Passenger		5,691
57.	Michigan Sleepers and Diners Recap:		
58.	Yard Switching, Line 21		39
59.	Work, Line 34		36
60.	Exclusive, Line 44		2,132
61.	Total Michigan Sleepers and Diners		2,207
62.	Michigan Mail and Express Recap:		
63.	Yard Switching, Line 22		4
64.	Work, Line 35		15
65.	Exclusive, Line 45		782
66.	Total Michigan Mail and Express		801
67.	Michigan Passengers and Baggage Recap:		
68.	Yard Switching, Line 23		34
69.	Work, Line 36		51
70.	Exclusive, Line 46		2,598
71.	Total Michigan Passengers and Baggage		2,683
72.	Michigan Passengers and Baggage, Line 71	100.00	2,683
73.	Divided on Michigan Passenger Miles, Ratio No. 10		
74.	Interstate	29.33	787
75.	Intrastate	70.67	1,896

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 310—Steam Locomotives—Retirements.

				%	$
1.	System Total, per Annual Report				136
2.	Divided to Services by Delf.				
3.		Freight			128
4.		Work			2
5.		Passenger			6
6.	System Freight, Line 3			100.00	128
7.	Divided relatively with the total mileage of Freight Train Locomotives (including proportion of Mixed and Special) plus Freight proportion of Yard Switching miles, in and outside of Michigan		1,618,114		
8.		Outside Michigan	227,026	14.03	18
9.		Michigan	1,391,088	85.97	110
10.	System Work, Line 4			100.00	2
11.	Divided relatively with the charges to Michigan and outside of Michigan in Account No. 326		$ 14,208		
12.		Outside Michigan	2,992	21.06	0
13.		Michigan	11,216	78.94	2
14.	Michigan Work, Line 13			100.00	2
15.	Divided relatively with the charges to Michigan Freight and Passenger in Account No. 326		$ 11,216		
16.		Freight	8,938	79.69	2
17.		Passenger	2,278	20.31	0
18.	Michigan Freight Recap:				
19.		Exclusive, Line 9			110
20.		Work, Line 16			2
21.		Total Michigan Freight			112

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 310—Steam Locomotives—Retirements (Continued).

			%	$
22.	System Passenger, Line 5		100.00	6
23.	Divided relatively with the total mileage of D. S. S. & A. Passenger Train Locomotives (including proportion of Mixed and Special) plus Passenger proportion of Yard Switching miles, in and outside of Michigan	955,047		
24.	Outside Michigan	161,371	16.90	1
25.	Michigan	793,676	83.10	5
26.	Michigan Passenger, Line 25		100.00	5
27.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1b.			
28.	Sleepers and Diners		38.67	2
29.	Mail and Express		14.19	1
30.	Passengers and Baggage		47.14	2
31.	Michigan Passengers and Baggage, Line 30		100.00	2
32.	Divided on Michigan Passenger Miles, Ratio No. 10.			
33.	Interstate		29.33	1
34.	Intrastate		70.67	1

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 314—Freight Train Cars—Repairs.
No. 315—Freight Train Cars—Depreciation.
No. 316—Freight Train Cars—Retirements.

	No. 314	No. 315	No. 316
	$	$	$
1. System Total, per Annual Report	160,384	61,517	17,233
2. Assigned to Michigan by Delf.	136,214	52,247	14,636

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 317. Passenger Train Cars—Repairs.

No. 318. Passenger Train Cars—Depreciation.

			No. 317	No. 318
		%	$	$
1. System Total, per Annual Report			50,613	12,367
2. Allocated to Services.				
3. Sleeper			5,445 (a)	2,684
4. Diner and Observation			3,850 (a)	2,421
5. Mail & Express and Passengers & Baggage			41,308	7,262
6. System Sleepers and Diners Recap:				
7. Sleeper, Line 3			5,455	2,684
8. Diner and Observation, Line 4			3,850	2,421
9. Total System Sleepers and Diners			9,305	5,105
10. System Sleepers and Diners, Line 9		100.00	9,305	5,105
11. Divided relatively with the total mileage of Sleepers and Diners in and outside of Michigan (including mileage on Mineral Range)	1,063,645			
12. Outside Michigan	224,492	21.11	1,964	1,078
13. Michigan	839,153	78.89	7,341	4,027
14. System Mail & Express and Passengers & Baggage, Line 5		100.00	41,308	7,262
15. Divided on Total DSS&A Passenger Car Miles, Ratio No. 3c.				
16. Outside Michigan		16.45	6,795	1,195
17. Michigan—M.R.		3.84	1,586	279
18. Michigan—D.S.S.&A.		79.71	32,927	5,788
19. Michigan DSS&A Mail & Express and Pass. & Baggage, Line 18.		100.00	32,927	5,788
20. Divided on Michigan DSS&A Passenger Car Miles, Ratio No. 3d.				
21. Mail and Express		24.48	8,061	1,417
22. Passengers and Baggage		75.52	24,866	4,371

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 317. Passenger Train Cars—Repairs—Continued

No. 318. Passenger Train Cars—Depreciation—Continued

		No. 317	No. 318
	%	$	$
23. Michigan Passengers and Baggage, Line 22	100.00	24,866	4,371
24. Divided on Michigan Passenger Miles, Ratio No. 10.			
25. Interstate	29.33	7,293	1,282
26. Intrastate	70.67	17,573	3,089

(a) These amounts are the charges on account of these services for 1914, the last year for which we have been able to ascertain these expenses.

The present Classification requires that primary accounts involving expenditures for operations of this kind shall be kept so that they may be ascertained, but the Company has not kept its accounts in that manner, and we are advised that the figures cannot now be had.

No. 326. Work Equipment—Repairs.
No. 327. Work Equipment—Depreciation.
No. 328. Work Equipment—Retirements.

			No. 326	No. 327	No. 328
		%	$	$	$
1. System Totals, per Annual Report		100.00	14,208	3,670	278
2. Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 202 to 225 inclusive, 241, 243, 247, 249 and 272 (see detail page following)	$643,739				
3. Outside Michigan	135,584	21.06	2,992	773	59
4. Michigan	508,155	78.94	11,216	2,897	219
5. Michigan Total, Line 4		100.00	11,216	2,897	219
6. Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 202 to 225 inclusive, 241, 243, 247, 249 and 272 (see detail page following)	$508,155				
7. Freight	404,942	79.69	8,938	2,309	175
8. Passenger	103,213	20.31	2,278	588	44
9. Michigan Passenger, Line 8		100.00	2,278	588	44
10. Divided relatively with the total of charges to Michigan Passenger Services in Accounts 202 to 225 inclusive, 241, 243, 247, 249 and 272 (see detail page following)	$103,213				
11. Sleepers and Diners	36,764	35.62	811	209	16
12. Mail and Express	14,658	14.20	324	84	6
13. Passengers & Baggage	51,791	50.18	1,143	295	22
14. Michigan Passengers and Baggage, Line 13		100.00	1,143	295	22
15. Divided on Michigan Passenger Miles, Ratio No. 10.					
16. Interstate		29.33	335	87	6
17. Intrastate		70.67	808	208	16

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Details for Dividing Accounts. Nos. 326, 327 and 328.

Acct. No.	System Total	Outside Michigan	MICHIGAN					
			Total	Freight	PASSENGER			
					Total	Sleepers and Diners	Mail and Express	Passengers and Baggage
	$	$	$	$	$	$	$	$
202	67,154	15,652	51,502	41,543	9,959	2,801	1,462	5,696
208	56,221	38,600	17,621	13,727	3,894	1,095	572	2,227
212	78,794	18,460	60,334	47,278	13,056	4,964	1,837	6,255
214	35,448	1,373	34,075	26,702	7,373	2,803	1,037	3,533
216	36,880	6,264	30,616	23,991	6,625	2,519	932	3,174
218	15,694	856	14,838	11,627	3,211	1,221	452	1,538
220	264,791	45,938	218,853	171,496	47,357	18,005	6,663	22,689
221	7,515	1,716	5,799	4,677	1,122	316	165	641
223	796	39	757	611	146	41	21	84
225	2,911	328	2,583	2,084	499	140	73	286
241	2,878		2,878	1,765	1,113	368	144	601
243	17,285		17,285	17,285				
247	6,053	910	5,143	4,108	1,035	291	152	592
249	1,382	695	687	651	36	10	5	21
272	49,937	4,753	45,184	37,397	7,787	2,190	1,143	4,454
Total	$643,739	$135,584	$508,155	$404,942	$103,213	$36,764	$14,658	$51,791

THIS PAGE BOUND

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 332. Injuries to Persons.

			%	$
1.	System Total, per Annual Report			2,667
2.	Allocated to Services by Delf.			
3.	Freight			855
4.	Common Freight and Passenger			1,794
5.	Passenger			18
6.	System Freight, Line 3		100.00	855
7.	Divided relatively with the total mileage of Freight train cars in and outside of Michigan. (Delf's Ex.)	20,251,934		
8.	Outside Michigan	3,052,510	15.07	129
9.	Michigan	17,199,424	84.93	726
10.	System Passenger, Line 5		100.00	18
11.	Divided relatively with the total mileage of Passenger train Cars in and outside of Michigan. (Delf's Ex.)	4,404,788		
12.	Outside Michigan	696,350	15.81	3
13.	Michigan	3,708,438	84.19	15
14.	System Common, Line 4		100.00	1,794
15.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$352,572		
16.	Outside Michigan	55,028	15.61	280
17.	Michigan	297,544	84.39	1,514
18.	Michigan Common, Line 17		100.00	1,514
19.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$293,835		
20.	Freight	212,532	72.33	1,095
21.	Passenger	81,303	27.67	419

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 332. Injuries to Persons (Continued).

			%	$
22.	Michigan Freight Recap:			
23.	Exclusive, Line 9			726
24.	Common, Line 20			1,095
25.	Total Michigan Freight			1,821
26.	Michigan Passenger Recap:			
27.	Exclusive, Line 13			15
28.	Common, Line 21			419
29.	Total Michigan Passenger			434
30.	Michigan Passenger, Line 29		100.00	434
31.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$81,303		
32.	Sleepers and Diners	23,142	28.46	124
33.	Mail and Express	13,855	17.04	74
34.	Passengers and Baggage	44,306	54.50	236
35.	Michigan Passengers and Baggage, Line 34		100.00	236
36.	Divided on Michigan Passenger Miles, Ratio No. 10			
37.	Interstate		29.33	69
38.	Intrastate		70.67	167

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 333. Insurance.

			%	$
1.	System Total, per Annual Report, $2,500; allocated to Michigan.			2,148
2.	Allocated to Services			
3.	Freight			1,161
4.	Common Freight and Passenger			703
5.	Passenger			284
6.	Michigan Common, Line 4		100.00	703
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)			
		$293,835		
8.	Freight	212,532	72.33	508
9.	Passenger	81,303	27.67	195
10.	Michigan Freight Recap:			
11.	Exclusive, Line 3			1,161
12.	Common, Line 8			508
13.	Total Michigan Freight			1,669
14.	Michigan Passenger Recap:			
15.	Exclusive, Line 5			284
16.	Common, Line 9			195
17.	Total Michigan Passenger			479
18.	Michigan Passenger, Line 17		100.00	479
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)			
		$81,303		
20.	Sleepers and Diners	23,142	28.46	136
21.	Mail and Express	13,855	17.04	82
22.	Passengers and Baggage	44,306	54.50	261

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 333. Insurance (Continued).

		%	$
23.	Michigan Passengers and Baggage, Line 22	100.00	261
24.	Divided on Michigan Passenger Miles, Ratio No. 10.		
25.	Interstate	29.33	77
26.	Intrastate	70.67	184

NOTE:—Delf divides the Common Portion of this charge as follows:

Miscellaneous Buildings other than Marquette Shops	$ 41.60
Contents of Roundhouses	31.80
Marquette Shops (Contents)	498.40
Locomotives	172.29
Work Equipment	34.93
Total	$779.02

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 334. Stationery and Printing.

			%	$
1.	System Total, per Annual Report		100.00	1,710
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)			
3.	Outside Michigan	$352,572		
4.	Michigan	55,028	15.61	267
		297,544	84.39	1,443
5.	Michigan Total, Line 4		100.00	1,443
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)			
7.	Freight	$293,835		
8.	Passenger	212,532	72.33	1,044
		81,303	27.67	399
9.	Michigan Passenger, Line 8		100.00	399
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)			
11.	Sleepers and Diners	$81,303		
12.	Mail and Express	23,142	28.46	114
13.	Passengers and Baggage	13,855	17.04	68
		44,306	54.50	217
14.	Michigan Passengers and Baggage, Line 13		100.00	217
15.	Divided on Michigan Passenger Miles, Ratio No. 10			
16.	Interstate		29.33	64
17.	Intrastate		70.67	153

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 336. Maintaining Joint Equipment at Terminals—Dr.

	$
1. System Total, per Annual Report, $1,997; allocated to Michigan by Delf	1

All Freight.

NOTE—The Michigan Common portion of this charge locates as follows:

Freight	$ .32
Passenger	.22
Total	$ .54

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 337. Maintaining Joint Equipment at Terminals—Cr.

			%	$
1.	System Total, per Annual Report, $2; allocated to Michigan by Delf.		100.00	2*
2.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 308, 314, 317 and 326 (see detail page following Account No. 301)	$293,835		
3.	Freight	212,532	72.33	1*
4.	Passenger (all Intrastate Pass. & Baggage)	81,303	27.67	1*

NOTE:—This charge (exact amount, $1.50) is for Insurance on Joint Equipment at the Soo.

*Typewritten in red.

III. TRAFFIC

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

III. TRAFFIC.
No. 351. Superintendence.

		%	$
1.	System Total, Per Annual Report		32,164
2.	Allocated to Services by Delf.		
3.	Freight		18,003
4.	Passenger (all Passengers and Baggage)		14,161
5.	System Freight, Line 3	100.00	18,003
6.	Divided on System Revenue Freight Train Miles, Ratio No. 11a.		
7.	Outside Michigan	17.78	3,201
8.	Michigan	82.22	14,802
9.	System Passengers and Baggage, Line 4	100.00	14,161
10.	Divided on System Revenue Passenger Train Miles, Ratio No. 11b.		
11.	Outside Michigan	17.39	2,463
12.	Michigan	82.61	11,698
13.	Michigan Passengers and Baggage, Line 12	100.00	11,698
14.	Divided on Michigan Passenger Miles, Ratio No. 10		
15.	Interstate	29.33	3,431
16.	Intrastate	70.67	8,267

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 352. Outside Agencies.

			%	$
1.	System Total, per Annual Report			32,715
2.	Allocated to Services by Delf.			
3.	Freight			17,519
4.	Passenger (all Passengers and Baggage)			15,196
5.	System Freight, Line 3.		100.00	17,519
6.	Divided on System Revenue Freight Train Miles, Ratio No. 11a.			
7.	Outside Michigan		17.78	3,115
8.	Michigan		82.22	14,404
9.	System Passengers and Baggage, Line 4		100.00	15,196
10.	Divided on System Revenue Passenger train Miles, Ratio No. 11b.			
11.	Outside Michigan		17.39	2,643
12.	Michigan		82.61	12,553
13.	Michigan Passengers and Baggage, Line 12		100.00	12,553
14.	Divided, by agreement, on the basis of the allocations and assignments of the years 1910, 1911, 1912 and 1913	$134,057		
15.	Interstate	123,373	92.03	11,553
16.	Intrastate	10,684	7.97	1,000

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY
Fiscal Year 1917.

No. 353. Advertising.

			%	$
1.	System Total, per Annual Report			3,757
2.	Allocated to Services by Delf.			
3.	Freight			40
4.	Passenger (all Passengers and Baggage)			3,717
5.	System Freight, Line 3		100.00	40
6.	Divided on System Revenue Freight Train Miles, Ratio No. 11a.			
7.	Outside Michigan		17.78	7
8.	Michigan		82.22	33
9.	System Passengers and Baggage, Line 4		100.00	3,717
10.	Divided on System Revenue Passenger Train Miles, Ratio No. 11b.			
11.	Outside Michigan		17.39	646
12.	Michigan		82.61	3,071
13.	Michigan Passengers and Baggage, Line 12		100.00	3,071
14.	Divided, by agreement, on the basis of the allocations and assignments of the years 1910, 1911, 1912 and 1913	$18,909		
15.	Interstate	13,057	69.06	2,121
16.	Intrastate	5,852	30.94	950

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 354. Traffic Associations.

	$
1. System Total, per Annual Report, $362; allocated to Michigan by Delf	298

All Freight.

No. 355. Fast Freight Lines.

	$
1. System Total, per Annual Report, $7; allocated to Michigan by Delf.	6

All Freight.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 356. Industrial and Immigration Bureaus.

			%	$
1.	System Total, per Annual Report		100.00	9,128
2.	Divided on basis of Delf's System Freight and Passenger Revenue	$3,872,391		
3.	Freight	2,741,033	70.79	6,462
4.	Passenger (All Passengers and Baggage)	1,131,358	29.21	2,666
5.	System Freight, Line 3		100.00	6,462
6.	Divided on basis of Delf's System Freight Revenue	$2,741,033		
7.	Outside Michigan	325,231	11.87	767
8.	Michigan	2,415,802	88.13	5,695
9.	System Passengers and Baggage, Line 4		100.00	2,666
10.	Divided on basis of Delf's System Passenger Revenue	$1,131,358		
11.	Outside Michigan	160,574	14.19	378
12.	Michigan	970,784	85.81	2,288
13.	Michigan Passengers and Baggage, Line 12		100.00	2,288
14.	Divided on Michian Passenger Miles, Ratio No. 10.			
15.	Interstate		29.33	671
16.	Intrastate		70.67	1,617

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 357. Insurance.

		%	$
1.	System Total, per Annual Report, $109; allocated to Michigan by Delf.		51
2.	Allocated to Services by Delf.		
3.	Common Freight and Passenger (charged all to Freight)		1
4.	Passenger (all Passengers and Baggage)		50
5.	Michigan Passengers and Baggage, Line 4	100.00	50
6.	Divided on Mich. Passenger Miles, Ratio No. 10.		
7.	Interstate	29.33	15
8.	Intrastate	70.67	35

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 358. Stationery and Printing.

		%	$
1.	System Total, per Annual Report		$8,903
2.	Allocated to Services by Delf.		
3.	Freight		5,978
4.	Passenger (all Passengers and Baggage)		2,925
5.	System Freight, Line 3	100.00	5,978
6.	Divided on System Revenue Freight Train miles, Ratio No. 11a.		
7.	Outside Michigan	17.78	1,063
8.	Michigan	82.22	4,915
9.	System Passengers and Baggage, Line 4	100.00	2,925
10.	Divided on System Revenue Passenger Train miles, Ratio No. 11b.		
11.	Outside Michigan	17.39	509
12.	Michigan	82.61	2,416
13.	Michigan Passengers and Baggage, Line 12	100.00	2,416
14.	Divided on Michigan Passenger Miles, Ratio No. 10.		
15.	Interstate	29.33	709
16.	Intrastate	70.67	1,707

IV Transportation—Rail Line

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

IV. TRANSPORTATION—RAIL LINE.
No. 371. Superintendence.

			%	$
1.	System Total, per Annual Report			23,736
2.	Assigned to Services			
3.	Freight (85% of Car Accountant's Pay roll)			4,152
4.	Passenger (15% of Car Accountant's Pay roll)			733
5.	Common Freight and Passenger (all other than Car Acct's Pay roll)			18,851
6.	System Freight, Line 3		100.00	4,152
7.	Divided relatively with the total Mileage of Freight Train Cars in and outside of Michigan (Delf's Ex.)	20,251,934		
8.	Outside Michigan	3,052,510	15.07	626
9.	Michigan	17,199,424	84.93	3,526
10.	System Passenger, Line 4		100.00	733
11.	Divided relatively with the total mileage of Passenger Train Cars in and outside of Michigan (Delf's Ex.)	4,404,788		
12.	Outside Michigan	696,350	15.81	116
13.	Michigan	3,708,438	84.19	617
14.	Michigan Passenger, Line 13		100.00	617
15.	Divided on Michigan Total Passenger train Car Miles, Ratio No. 3.			
16.	Sleepers and Diners		28.13	174
17.	Mail and Express		14.68	90
18.	Passengers and Baggage		57.19	353

No. 371.—Superintendence (Continued).

			%	$
19.	System Common, Line 5		100.00	18,851
20.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 372 to 420 inclusive, except 407 and 410 (see detail page following)	$1,525,188		
21.	Outside Michigan	239,655	15.71	2,961
22.	Michigan	1,285,533	84.29	15,890
23.	Michigan Common, Line 22		100.00	15,890
24.	Divided relatively with the total of charges to Michigan Freight and Passenger (MR and DSS&A) in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following)	$1,266,253		
25.	Freight	929,755	73.43	11,668
26.	Passenger—MR	14,342	1.13	180
27.	Passenger—DSS&A	322,156	25.44	4,042
28.	Michigan D.S.S.&A. Passenger, Line 27		100.00	4,042
29.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following)	$322,156		
30.	Sleepers and Diners	107,936	33.50	1,354
31.	Mail and Express	39,737	12.34	499
32.	Passengers and Baggage	174,483	54.16	2,189

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 371.—Superintendence (Continued).

		%	$
33.	Michigan Freight Recap:		
34.	Car Accountant's Pay roll, Line 9		3,526
35.	Other, Line 25		11,668
36.	Total Michigan Freight		15,194
37.	Michigan Passenger Recap:		
38.	Car Accountant's Pay roll, Line 13		617
39.	Other, Line 27		4,042
40.	Total Michigan Passenger		4,659
41.	Michigan Sleepers and Diners Recap:		
42.	Car Accountant's Pay roll, Line 16		174
43.	Other, Line 30		1,354
44.	Total Michigan Sleepers and Diners		1,528
45.	Michigan Mail and Express Recap:		
46.	Car Accountant's Pay roll, Line 17		90
47.	Other, Line 31		499
48.	Total Michigan Mail and Express		589
49.	Michigan Passengers and Baggage Recap:		
50.	Car Accountant's Pay roll, Line 18		353
51.	Other, Line 32		2,189
52.	Total Michigan Passengers and Baggage		2,542
53.	Michigan Passengers and Baggage, Line 52	100.00	2,542
54.	Divided on Michigan Passenger Miles, Ratio No. 10.		
55.	Interstate	29.33	746
56.	Intrastate	70.67	1,796

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Details for dividing Accounts Nos. 371, 407, 410, 411, 412, 413, 414, 415, 416, 417 and 420.

Acct No.	System Total	Outside Michigan	MICHIGAN			D. S. S. & A. PASSENGER			
			Total	Freight	Mineral Range Passenger	Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
	$	$	$	$	$	$	$	$	$
372	14,584	2,191	12,393	9,898		2,495	702	366	1,427
373	194,131	19,314	174,817	152,828		21,989		2,199	19,790
374	1,428	254	1,174	1,174					
375	26,636		26,636	26,636					
376	13,117	1,096	12,021	9,698		2,323			2,323
377	5,221		5,221	5,115		106	61	2	43
378	58,460	3,827	54,633	53,241		1,392	692	75	625
379	4,915	38	4,877	4,731		146	84	3	59
380	41,721	2,984	38,737	37,727		1,010	507	53	450
382	44,126	3,912	40,214	39,146		1,068	524	60	484
385	1,218	282	936	910		26	13	1	12
386	621	57	564	551		13	6	1	6
387	568	21	547	537		10	5	0	5
388	18,788	811	17,977	17,601		376	198	16	162
389	1,443	69	1,374	1,332		42	24	1	17
390	31,426	12,005	19,421	12,882		6,539	2,529	928	3,082
391	*17,280		*17,280	*15,355		*1,925	*704	*267	*954
392	205,500	33,291	172,209	110,874	3,209	58,126	22,477	8,248	27,401
394	440,587	71,591	368,996	248,710	6,288	113,998	44,083	16,176	53,739
397	17,176	2,791	14,385	9,696	245	4,444	1,718	631	2,095
398	6,899	1,118	5,781	3,504	130	2,147	830	305	1,012

*Typewritten in Red.

Details for dividing Accounts Nos. 371, 407, 410, 411, 412, 413, 414, 415, 416, 417 and 420. (Continued.)

			MICHIGAN						
						D. S. S. & A. PASSENGER			
Acct No.	System Total	Outside Michigan	Total	Freight	Mineral Range Passenger	Total	Sleepers & Diners	Mail & Express	Passengers & Baggage
	$	$	$	$	$	$	$	$	$
399	3,936	638	3,298	2,055	63	1,180	456	168	556
400	55,955	7,649	48,306	29,942		18,364	7,101	2,606	8,657
401	235,476	39,900	195,576	141,640	2,935	51,001	8,116	4,244	38,641
402	42,403	7,075	35,328	8,277	1,472	25,579	7,361	3,850	14,368
403	14,455	3,438	11,017			11,017	11,017		
404	1,364	1,333	31	29		2	1		1
405	9,664	480	9,184	8,703		481	135	71	275
418	9,333	1,660	7,673	7,673					
419	220	13	207			207			207
Total	1,484,091	217,838	1,266,253	929,755	14,342	322,156	107,936	39,737	174,483
411	1,778	269	1,509						
412	4,228	3,187	1,041						
413	*5,454	*1,570	*3,884						
414	1,251	156	1,095						
415	5,785	1,834	3,951						
416	265		265						
417	479	90	389						
420	32,765	17,851	14,914						
	1,525,188	239,655	1,285,533						

*Typewritten in red

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 372—Dispatching Trains.

			%	$
1.	System Total, per Annual Report		100.00	14,534
2.	Divided on System Time, Ratio No. 4a.			
3.	Freight		79.48	11,591
4.	Passenger		20.52	2,993
5.	System Freight, Line 3		100.00	11,591
6.	Divided relatively with the Total Mileage of Freight Trains (including proportion of Mixed and Special), plus Train and Yard Switching, in and outside of Michigan	1,503,587		
7.	Outside Michigan	219,606	14.61	1,693
8.	Michigan	1,283,981	85.39	9,898
9.	System Passenger, Line 4		100.00	2,993
10.	Divided relatively with the Total Mileage of Passenger Trains (including C.&N.W. and C.M.&St.P. operations into Marquette, and proportion of Mixed and Special), plus Train and Yard Switching, in and outside of Michigan	951,427		
11.	Outside Michigan	158,178	16.63	498
12	Michigan	793,249	83.37	2,495
13.	Michigan Passenger, Line 12		100.00	2,495
14.	Divided on Michigan Total Passenger Train Car Miles, Ratio No. 3.			
15.	Sleepers and Diners		28.13	702
16.	Mail and Express		14.68	366
17.	Passengers and Baggage		57.19	1,427
18.	Michigan Passengers and Baggage, Line 17		100.00	1,427
19.	Divided on Michigan Passenger Miles, Ratio No. 10.			
20.	Interstate		29.33	419
21.	Intrastate		70.67	1,008

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 373—Station Employees.

		%	$
1.	System Total, per Annual Report, $194,131; allocated to Michigan by Delf		174,817
2.	Allocated to Services by Delf.		
3.	Freight		79,331
4.	Common Freight and Passenger		84,073
5.	Passenger		11,413
6.	Michigan Common, Line 4	100.00	84,073
7.	Divided on Station Pay Roll, Ratio No. 17		
8.	Freight	87.42	73,497
9	Passenger	12.58	10,576
10.	Michigan Freight Recap.:		
11.	Exclusive, Line 3		79,331
12.	Common, Line 8		73,497
13.	Total Michigan Freight		152,828
14.	Michigan Passenger Recap.:		
15.	Exclusive, Line 5		11,413
16.	Common, Line 9		10,576
17.	Total Michigan Passenger		21,989
18	10% of Michigan Passenger charged to Mail and Express, because of Station Employees having to handle Mail to, from and at Stations		2,199
19.	Balance, all Passengers and Baggage		19,790
20.	Michigan Passengers and Baggage, Line 19	100.00	19,790
21.	Divided on Michigan Passenger Miles, Ratio No. 10		
22.	Interstate	29.33	5,804
23.	Intrastate	70.67	13,986

NOTE—This account was allocated by us, as indicated above. Of the Total Passenger allocation, the following is directly charged Labor on account of Mail:

Sault Ste. Marie	$442.50
Marquette	493.95
Champion	30.00
Houghton	270.00
Total	$1,236.45

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 374. Weighing, Inspection and Demurrage Bureaus.
No. 375. Coal and Ore Wharves.

	No. 374	No. 375
	$	$
1. System Totals, per Annual Report	1,428	26,636
2. Allocated to Michigan by Delf All Freight.	1,174	26,636

No. 376. Station Supplies and Expenses.

		%	$
1. System Total per Annual Report, $13,117; allocated to Michigan			12,021
2. Allocated to Services.			
3. Freight			3,569
4. Common Freight and Passenger			7,011
5. Passenger			1,441
6. Michigan Common, Line 4		100.00	7,011
7. Divided relatively with the total charges to Michigan Freight and Passenger in Account No. 373	$174,817		
8. Freight	152,828	87.42	6,129
9. Passenger	21,989	12.58	882
10. Michigan Freight Recap:			
11. Exclusive, Line 3			3,569
12. Common, Line 8			6,129
13. Total Michigan Freight			9,698
14. Michigan Passenger Recap:			
15. Exclusive, Line 5			1,441
16. Common, Line 9			882
17. Total Michigan Passenger (All Passengers and Baggage)			2,323
18. Michigan Passengers and Baggage, Line 17		100.00	2,323
19. Divided on Michigan Passenger Miles, Ratio No. 10.			
20. Interstate		29.33	681
21. Intrastate		70.67	1,642

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 377. Yard Masters and Yard Clerks.
No. 378. Yard Conductors and Brakemen.
No. 379. Yard Switch and Signal Tenders.
No. 380. Yard Enginemen

		%	No. 377 $	No. 378 $	No. 379 $	No. 380 $
1.	System Totals, per Annual Report		5,221	58,460	4,915	41,721
2.	Allocated to Michigan by Delf		5,221	54,633	4,877	38,737
3.	Marquette Yard		3,024	27,097	4,078	20,197
4.	St. Ignace Yard		0	11,567	65	7,890
5.	Other Yards (all Freight)		2,197	15,969	734	10,650
6	Marquette Yard, Line 3	100.00	3,024	27,097	4,078	20,197
7.	Divided relatively with the total Yard Switching Miles at Marquette.					
8.	Freight	96.48	2,918	26,143	3,934	19,486
9.	Passenger	3.52	106	954	144	711
10.	St. Ignace Yard, Line 4	100.00	0	11,567	65	7,890
11.	Divided relatively with the Total Yard Switching Miles at St. Ignace.					
12.	Freight	96.21	0	11,129	63	7,591
13.	Passenger	3.79	0	438	2	299
14.	Michigan Passenger Marquette Yard, Line 9	100.00	106	954	144	711
15.	Divided relatively with the Passenger Yard Switching Miles at Marquette					
16.	Sleepers and Diners	57.37	61	547	83	408
17.	Mail and Express	1.92	2	18	3	14
18.	Passengers and Baggage	40.71	43	389	58	289
19.	Michigan Passenger St. Ignace Yard, Line 13	100.00	0	438	2	299
20.	Divided relatively with the Passenger Cars over St. Ignace Slip Dock					
21.	Sleepers and Diners	33.09	0	145	1	99
22.	Mail and Express	12.94	0	57	0	39
23.	Passengers and Baggage	53.97	0	236	1	161

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 377. Yard Masters and Yard Clerks.
No. 378. Yard Conductors and Brakemen.
No. 379. Yard Switch and Signal Tenders.
No. 380. Yard Enginemen—(Continued)

		%	No. 377 $	No. 378 $	No. 379 $	No. 380 $
24.	Michigan Freight Recap.:					
25.	Marquette Yard, Line 8		2,918	26,143	3,934	19,486
26.	St. Ignace Yard, Line 12		0	11,129	63	7,591
27.	Other Yards, Line 5		2,197	15,969	734	10,650
28.	Total Michigan Freight		5,115	53,241	4,731	37,727
29.	Michigan Passenger Recap.:					
30.	Marquette Yard, Line 9		106	954	144	711
31.	St. Ignace Yard, Line 13		0	438	2	299
32.	Total Michigan Passenger		106	1,392	146	1,010
33.	Michigan Sleepers and Diners Recap.:					
34.	Marquette Yard, Line 16		61	547	83	408
35.	St. Ignace Yard, Line 21		0	145	1	99
36.	Total Michigan Sleepers and Diners		61	692	84	507
37.	Michigan Mail and Express Recap.:					
38.	Marquette Yard, Line 17		2	18	3	14
39.	St. Ignace Yard, Line 22		0	57	0	39
40.	Total Michigan Mail and Express		2	75	3	53
41.	Michigan Passenger and Baggage Recap.:					
42.	Marquette Yard, Line 18		43	389	58	289
43.	St. Ignace Yard, Line 23		0	236	1	161
44.	Total Michigan Passengers and Baggage		43	625	59	450
45.	Michigan Passengers and Baggage, Line 44	100.00	43	625	59	450
46.	Divided on Michigan Passenger Miles, Ratio No. 10					
47.	Interstate	29.33	13	183	17	132
48.	Intrastate	70.67	30	442	42	318

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 382. Fuel for Yard Locomotives.
No. 385. Water for Yard Locomotives.
No 386. Lubricants for Yard Locomotives.
No. 387. Other Supplies for Yard Locomotives.

		%	No. 382 $	No. 385 $	No. 386 $	No. 387 $
1.	System Totals, per Annual Report		44,126	1,218	621	568
2.	Allocated to Michigan by Delf.		40,214	936	564	547
3.	Marquette Yard		19,930	479	265	207
4.	St. Ignace Yard		9,661	235	116	68
5.	Other Yards (all freight)		10,623	222	183	272
6.	Marquette Yard, Line 3	100.00	19,930	479	265	207
7.	Divided relatively with the Total Yard Switching miles at Marquette:					
8.	Freight	96.48	19,228	462	256	200
9.	Passenger	3.52	702	17	9	7
10.	St. Ignace Yard, Line 4	100.00	9,661	235	116	68
11.	Divided relatively with the Total Yard Switching Miles at St. Ignace:					
12.	Freight	96.21	9,295	226	112	65
13.	Passenger	3.79	366	9	4	3
14.	Michigan Passenger — Marquette Yd., Line 9	100.00	702	17	9	7
15.	Divided relatively with the Passenger Yard Switching Miles at Marquette:					
16.	Sleepers and Diners	57.37	403	10	5	4
17.	Mail and Express	1.92	13	0	0	0
18.	Passengers and Baggage	40.71	286	7	4	3
19.	Michigan Passenger—St. Ignace Yard, Line 13	100.00	366	9	4	3
20.	Divided relatively with the Passenger Cars over St. Ignace Slip Dock:					
21.	Sleepers and Diners	33.09	121	3	1	1
22.	Mail and Express	12.94	47	1	1	0
23.	Passengers and Baggage	53.97	198	5	2	2

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 382. Fuel for Yard Locomotives.
No. 385. Water for Yard Locomotives.
No. 386. Lubricants for Yard Locomotives.
No. 387. Other Supplies for Yard Locomotives—Continued.

		%	No. 382 $	No. 385 $	No. 386 $	No. 387 $
24.	Michigan Freight Recapitulation:					
25.	Marquette Yard, Line 8		19,228	462	256	200
26.	St. Ignace Yard, Line 12		9,295	226	112	65
27.	Other Yards, Line 5		10,623	222	183	272
28.	Total Michigan Freight		39,146	910	551	537
29.	Michigan Passenger Recapitulation:					
30.	Marquette Yard, Line 9		702	17	9	7
31.	St. Ignace Yard, Line 13		366	9	4	3
32.	Total Michigan Passenger		1,068	26	13	10
33.	Michigan Sleepers and Diners Recap.:					
34.	Marquette Yard, Line 16		403	10	5	4
35.	St. Ignace Yard, Line 21		121	3	1	1
36.	Total Michigan Sleepers and Diners		524	13	6	5
37.	Michigan Mail and Express Recap.:					
38.	Marquette Yard, Line 17		13	0	0	0
39.	St. Ignace Yard, Line 22		47	1	1	0
40.	Total Michigan Mail and Express		60	1	1	0
41.	Michigan Passengers and Baggage Recap.:					
42.	Marquette Yard, Line 18		286	7	4	3
43.	St. Ignace Yard, Line 23		198	5	2	2
44.	Total Michigan Passengers and Baggage		484	12	6	5
45.	Michigan Passengers and Baggage, Line 44	100.00	484	12	6	5
46.	Divided on Michigan Passenger Miles, Ratio No. 10:					
47.	Interstate	29.23	142	4	2	1
48.	Intrastate	70.67	342	8	4	4

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 388. Enginehouse Expenses—Yard.
No. 389. Yard Supplies and Expenses.

		%	No. 388 $	No. 389 $
1.	System Totals, per Annual Report		18,788	1,443
2.	Allocated to Michigan by Delf		17,977	1,374
3.	Marquette Yard		8,550	1,198
4.	St. Ignace Yard		1,984	4
5.	Other Yards (all Freight)		7,443	172
6.	Marquette Yard, Line 3	100.00	8,550	1,198
7.	Divided relatively with the Total Yard Switching Miles at Marquette:			
8.	Freight	96.48	8,249	1,156
9.	Passenger	3.52	301	42
10.	St. Ignace Yard, Line 4	100.00	1,984	4
11.	Divided relatively with the Total Yard Switching Miles at St. Ignace:			
12.	Freight	96.21	1,909	4
13.	Passenger	3.79	75	0
14.	Michigan Passenger—Marquette Yard, Line 9	100.00	301	42
15.	Divided relatively with the Passenger Yard Switching Miles at Marquette:			
16.	Sleepers and Diners	57.37	173	24
17.	Mail and Express	1.92	6	1
18.	Passengers and Baggage	40.71	122	17
19.	Michigan Passenger—St. Ignace Yard, Line 13	100.00	75	0
20.	Divided relatively with the Passenger Cars over St. Ignace Slip Dock:			
21.	Sleepers and Diners	33.09	25	0
22.	Mail and Express	12.94	10	0
23.	Passengers and Baggage	53.97	40	0
24.	Michigan Freight Recapitulation:			
25.	Marquette Yard, Line 8		8,249	1,156
26.	St. Ignace Yard, Line 12		1,909	4
27.	Other Yards, Line 5		7,443	172
28.	Total Michigan Freight		17,601	1,332

No. 388. Enginehouse Expenses—Yard.
No. 389. Yard Supplies and Expenses—Continued.

		%	No. 388 $	No. 389 $
29.	Michigan Passenger Recapitulation:			
30.	Marquette Yard, Line 9		301	42
31.	St. Ignace Yard, Line 13		75	0
32.	Total Michigan Passenger		376	42
33.	Michigan Sleepers and Diners Recapitulation:			
34.	Marquette Yard, Line 16		173	24
35.	St. Ignace Yard, Line 21		25	0
36.	Total Michigan Sleepers and Diners		198	24
37.	Michigan Mail and Express Recapitulation:			
38.	Marquette Yard, Line 17		6	1
39.	St. Ignace Yard, Line 22		10	0
40.	Total Michigan Mail and Express		16	1
41.	Michigan Passengers and Baggage Recapitulation:			
42.	Marquette Yard, Line 18		122	17
43.	St. Ignace Yard, Line 23		40	0
44.	Total Michigan Passengers and Baggage		162	17
45.	Michigan Passengers and Baggage, Line 44	100.00	162	17
46.	Divided on Michigan Passenger Miles, Ratio No. 10:			
47.	Interstate	29.33	48	5
48.	Intrastate	70.67	114	12

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 390.—Operating Joint Yards and Terminals—Dr.

			%	$
1.	System Total, per Annual Report, $31,426; allocated to Michigan by Delf			19,421
2.	Allocated to Services by Delf:			
3.	Freight			12,857
4.	Common Freght and Passenger			37
5.	Passenger			6,527
6.	Michigan Common, Line 4		100.00	37
7.	Divided relatively with the direct charges to Michigan Freight and Passenger in this account	$19,384		
8.	Freight	12,857	66.33	25
9.	Passenger	6,527	33.67	12
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			12,857
12.	Common, Line 8			25
13.	Total Michigan Freight			12,882
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			6,527
16.	Common, Line 9			12
17.	Total Michigan Passenger			6,539
18.	Michigan Passenger, Line 17		100.00	6,539
19.	Divided on Michigan Passenger Gross Ton-Miles, Ratio No. 1b:			
20.	Sleepers and Diners		38.67	2,529
21.	Mail and Express		14.19	928
22.	Passengers and Baggage		47.14	3,082
23.	Michigan Passengers and Baggage, Line 22		100.00	3,082
24.	Divided on Michigan Passenger Miles, Ratio No. 10:			
25.	Interstate		29.33	904
26.	Intrastate		70.67	2,178

NOTE—The Michigan Common portion of this charge is for rental of Telephone Circuit between Mackinaw City, St. Ignace and Mackinaw Island.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 391. Operating Joint Yards and Terminals—Cr.

			%	$
1.	System Total, per Annual Report, *$17,280; allocated to Michigan			*17,280
2.	Allocated to Services			
3.	Freight			*13,210
4.	Common Freight and Passenger (Salaries and Club Dues at Soo)			*806
5.	Common Freight and Passenger (Soo Roundhouse)			*3,042
6.	Passenger			*222
7.	Michigan Common (Salaries and Club Dues at Soo), Line 4		100.00	*806
8.	Divided relatively with the total of charges of Michigan Freight and Passenger in Accounts 373 and 376	$186,838		
9.	Freight	162,526	86.99	*701
10.	Passenger	24,312	13.01	*105
11.	Michigan Passenger, Line 10		100.00	*105
12.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 373 and 376	$ 24,312		
13.	Mail and Express	2,199	9.04	*9
14.	Passengers and Baggage	22,113	90.96	*96
15.	Michigan Common (Soo Roundhouse), Line 5		100.00	*3,042
16.	Divided relatively with the number of Train Locomotives handled at Soo Roundhouse	1,744		
17.	Freight	689	39.51	*1,202
18.	Mixed	161	9.23	*281
19.	Passenger	894	51.26	*1,559

*Typewritten in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 891. Operating Joint Yards and Terminals—Cr. (Continued)

		%	$
20.	Michigan Common Mixed, Line 18	100.00	*281
21.	Divided relatively with the mileage of Freight and Passenger Cars in Mixed Trains		
22.	Freight	86.01	*242
23.	Passenger	13.99	*39
24.	Michigan Freight Recap.: (other than Salaries and Club Dues at Soo)		
25.	Exclusive, Line 3		*13,210
26.	Common Regular, Line 17		*1,202
27.	Common Mixed, Line 22		*242
28.	Total Michigan Freight other than Salaries at Soo		*14,654
29.	Michigan Passenger Recap.: (other than Salaries and Club Dues at Soo)		
30.	Exclusive, Line 6		*222
31.	Common Regular, Line 19		*1,559
32.	Common Mixed, Line 23		*39
33.	Total Michigan Passenger, other than Salaries and Club Dues at Soo		*1,820
34.	Michigan Passenger, Line 33	100.00	*1,820
35.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1b		
36.	Sleepers and Diners	38.67	*704
37.	Mail and Express	14.19	*258
38.	Passengers and Baggage	47.14	*858
39.	Michigan Freight Recap.:		
40.	Salaries and Club Dues at Soo, Line 9		*701
41.	Other, Line 28		*14,654
42.	Total Michigan Freight		*15,355
43.	Michigan Passenger Recap.:		
44.	Salaries and Club Dues at Soo, Line 10		*105
45.	Other, Line 33		*1,820
46.	Total Michigan Passenger		*1,925

* Typewritten in red.

No. 391. Operating Joint Yards and Terminals—Cr. (Continued)

		%	$
47.	Michigan Mail and Express Recap.:		
48.	Salaries and Club Dues at Soo, Line 13		*9
49.	Other, Line 37		*258
50.	Total Michigan Mail and Express		*267
51.	Michigan Passengers and Baggage Recap.:		
52.	Salaries and Club Dues at Soo, Line 14		*96
53.	Other, Line 38		*858
54.	Total Michigan Passengers and Baggage		*954
55.	Michigan Passengers and Baggage, Line 54	100.00	*954
56.	Divided on Michigan Passenger Miles, Ratio 10		
57.	Interstate	29.33	*280
58.	Intrastate	70.67	*674

* Typewritten in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 392. Train Enginemen.

			%	$
1.	System Total, per Annual Report			205,500
2.	Assigned to Services by Delf			
3.	Freight			132,229
4.	Passenger			73,271
5.	System Freight, Line 3		100.00	132,229
6.	Divided relatively with the Total Mileage of Freight train locomotives (including proportion of Mixed and Special) in and outside of Michigan	1,298,722		
7.	Outside Michigan	209,795	16.15	21,355
8.	Michigan	1,088,927	83.85	110,874
9.	System Passenger, Line 4		100.00	73,271
10.	Divided relatively with the Total Mileage of D8S&A Passenger Train Locomotives (including proportion of Mixed and Special) in and outside of Michigan, and on Mineral Range and D8S&A	990,785		
11.	Outside Michigan	161,364	16.29	11,936
12.	Michigan—M. R.	43,410	4.38	3,209
13.	Michigan—D. S. S. & A.	786,011	79.33	58,126
14.	Michigan D. S. S. & A. Passenger, Line 13		100.00	58,126
15.	Divided on Michigan Passenger Gross Ton-miles, Ratio No. 1b			
16.	Sleepers and Diners		38.67	22,477
17.	Mail and Express		14.19	8,248
18.	Passengers and Baggage		47.14	27,401
19.	Michigan Passengers and Baggage, Line 18		100.00	27,401
20.	Divided on Michigan Passenger Miles, Ratio No. 10			
21.	Interstate		29.33	8,037
22.	Intrastate		70.67	19,364

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 394.—Fuel for Train Locomotives.

			%	$
1.	System Total, per Annual Report			440,587
2.	Divided to Services by Delf.			
3.	Regular Freight			294,652
4.	Mixed (all Michigan)			2,325
5.	Special			471
6.	Regular Passenger			143,139
7.	System Regular Freight, Line 3		100.00	294,652
8.	Divided relatively with the total Mileage of Regular Freight Train Locomotives in and outside Michigan.	1,282,941		
9.	Outside Michigan	209,749	16.35	48,176
10.	Michigan	1,073,192	83.65	246,476
11.	Michigan Mixed, Line 4		100.00	2,325
12.	Divided relatively with the Mileage of Freight and Passenger Cars in Mixed Trains.			
13.	Freight		86.01	2,000
14.	Passenger		13.99	325
15.	System Special, Line 5		100.00	471
16.	Divided relatively with the Total Mileage of Special Train Locomotives in and outside of Michigan.	2,117		
17.	Outside Michigan	248	11.76	55
18.	Michigan	1,868	88.24	416

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 394—Fuel for Train Locomotives (Continued).

				%	$
19.	Michigan Special, Line 18			100.00	416
20.	Divided relatively with the Michigan Mileage of Special Train Locomotives in Mixed and Passenger Services.		1,868		
21.		Mixed	1,443	77.25	321
22.		Passenger	425	22.75	95
23.	Michigan Special Mixed, Line 21			100.00	321
24.	Divided relatively with the Mileage of Freight and Passenger Cars in Special Mixed Trains.				
25.		Freight		72.85	234
26.		Passenger		27.15	87
27.	Michigan Special Passenger Recap:				
28.		Exclusive, Line 22			95
29.		Mixed, Line 26			87
		Passenger			182
30.		Total Michigan Special			
31.	System Regular Passenger, Line 6			100.00	143,139
32.	Divided relatively with the Total Mileage of Regular DSS&A Passenger Train Locomotives in and outside of Michigan.		987,377		
33.		Outside Michigan	161,161	16.32	23,360
34.		Michigan (including Mineral Range)	826,216	83.68	119,779
35.	Michigan Regular Passenger, Line 34			100.00	119,779
36.	Divided relatively with the Michigan Mileage of Regular DSS&A Passenger Train Locomotives on Mineral Range and DSS&A.		826,216		
37.		Mineral Range	43,410	5.25	6,288
38.		D.S.S.&A.	782,806	94.75	113,491

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 394.—Fuel for Train Locomotives—Continued.

		%	$
39.	Michigan Freight Recap:		
40.	Regular, Line 10		246,476
41.	Mixed, Line 13		2,000
42.	Special, Line 25		234
43.	Total Michigan Freight		248,710
44.	Michigan Passenger Recap:		
45.	Mixed, Line 14		325
46.	Special, Line 30		182
47.	Regular, Line 38		113,491
48.	Total Michigan Passenger		113,998
49.	Michigan Passenger, Line 48	100.00	113,998
50.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1 b.		
51.	Sleepers and Diners	38.67	44,083
52.	Mail and Express	14.19	16,176
53.	Passengers and Baggage	47.14	53,739
54.	Michigan Passengers and Baggage, Line 53	100.00	53,739
55.	Divided on Michigan Passenger Miles, Ratio No. 10		
56.	Interstate	29.33	15,762
57.	Intrastate	70.67	37,977

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 397.—Water for Train Locomotives.

			%	$
1.	System Totals, per Annual Report		100.00	17,176
2.	Divided to Services relatively with Account No. 394	$ 440,587		
3.	Regular Freight	294,652	66.88	11,487
4.	Mixed (all Michigan)	2,325	.53	91
5.	Special	471	.10	17
6.	Regular Passenger	143,139	32.49	5,581
7.	System Regular Freight, Line 3		100.00	11,487
8.	Divided relatively with Account No. 394			
9.	Outside Michigan		16.35	1,878
10.	Michigan		83.65	9,609
11.	Michigan Mixed, Line 4		100.00	91
12.	Divided relatively with Account No. 394.			
13.	Freight		86.01	78
14.	Passenger		13.99	13
15.	System Special, Line 5		100.00	17
16.	Divided relatively with Account No. 394.			
17.	Outside Michigan		11.76	2
18.	Michigan		88.24	15
19.	Michigan Special, Line 18		100.00	15
20.	Divided relatively with Account No. 394.			
21.	Mixed		77.25	12
22.	Passenger		22.75	3
23.	Michigan Special Mixed, Line 21		100.00	12
24.	Divided relatively with Account No. 394.			
25.	Freight		72.85	9
26.	Passenger		27.15	3
27.	Michigan Special Passenger Recap:			
28.	Exclusive, Line 22			3
29.	Mixed, Line 26			3
30.	Total Michigan Special Passenger			6

No. 397—Water for Train Locomotives (Continued).

		%	$
31.	System Regular Passenger, Line 6	100.00	5,581
32.	Divided relatively with Account No. 394.		
33.	Outside Michigan	16.32	911
34.	Michigan	83.68	4,670
35.	Michigan Regular Passenger, Line 34	100.00	4,670
36.	Divided relatively with Account No. 394.		
37.	Mineral Range	5.25	245
38.	D.S.S.& A.	94.75	4,425
39.	Michigan Freight Recap:		
40.	Regular, Line 10		9,609
41.	Mixed, Line 13		78
42.	Special, Line 25		9
43.	Total Michigan Freight		9,696
44.	Michigan Passenger Recap:		
45.	Mixed, Line 14		13
46.	Special, Line 30		6
47.	Regular, Line 38		4,425
48.	Total Michigan Passenger		4,444
49.	Michigan Passenger, Line 48	100.00	4,444
50.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1 b.		
51.	Sleepers and Diners	38.67	1,718
52.	Mail and Express	14.19	631
53.	Passengers and Baggage	47.14	2,095
54.	Michigan Passengers and Baggage, Line 53	100.00	2,095
55.	Divided on Michigan Passenger Miles, Ratio No. 10.		
56.	Interstate	29.33	614
57.	Intrastate	70.67	1,481

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 389.—Lubricants for Train Locomotives.

				%	$
1.	System Total, per Annual Report				6,899
2.	Divided to Services.				
3.	Mineral Range Passenger (all Michigan)				130
4.	Regular Freight				4,142
5.	Mixed (all Michigan)				41
6.	Special Mixed				6
7.	Regular Passenger (includes Special Passenger)				2,580
8.	System Regular Freight, Line 4			100.00	4,142
9.	Divided relatively with the Total Mileage of Regular Freight Train Locomotives in and outside of Michigan.	1,282,941			
10.	Outside Michigan	209,749		16.35	677
11.	Michigan	1,073,192		83.65	3,456
12.	Michigan Mixed, Line 5			100.00	41
13.	Divided relatively with the Mileage of Freight and Passenger Cars in Mixed Trains.				
14.	Freight			86.01	35
15.	Passenger			13.99	6
16.	System Special Mixed, Line 6			100.00	6
17.	Divided relatively with the Total Mileage of Special Mixed Train Locomotives in and outside of Michigan.	1,507			
18.	Outside Michigan	64		4.25	0
19.	Michigan	1,443		95.75	6
20.	Michigan Special Mixed, Line 19			100.00	6
21.	Divided relatively with the Mileage of Freight and Passenger Train Cars in Special Mixed Train.				
22.	Freight			72.85	4
23.	Passenger			27.15	2

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 398.—Lubricants for Train Locomotives—Continued.

			%	$
24.	System Regular Passenger, Line 7		100.00	2,580
25.	Divided relatively with the Total Mileage of DSS&A Passenger Train Locomotives (including Special Passenger) in and outside of Michigan.	944,577		
26.	Outside Michigan	161,346	17.08	441
27.	Michigan	783,231	82.92	2,139
28.	Michigan Freight Recap:			
29.	Regular, Line 11			3,465
30.	Mixed, Line 14			35
31.	Special Mixed, Line 22			4
32.	Total Michigan Freight			3,504
33.	Michigan Passenger Recap:			
34.	Mixed, Line 15			6
35.	Special Mixed, Line 23			2
36.	Regular, Line 27			2,139
37.	Total Michigan Passenger			2,147
38.	Michigan Passenger, Line 37		100.00	2,147
39.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1 b.			
40.	Sleepers and Diners		38.67	830
41.	Mail and Express		14.19	305
42.	Passengers and Baggage		47.14	1,012
43.	Michigan Passengers and Baggage, Line 42		100.00	1,012
44.	Divided on Michigan Passenger Miles, Ratio No. 10.			
45.	Interstate		29.33	297
46.	Intrastate		70.67	715

No. 399. Other Supplies for Train Locomotives.

			%	$
1.	System Total, per Annual Report			3,936
2.	Divided to Services (Hillman data).			
3.	Mineral Range Passenger (All Michigan)			63
4.	Regular Freight			2,421
5.	Mixed (All Michigan)			32
6.	Special			4
7.	Regular Passenger			1,416
8.	System Regular Freight, Line 4		100.00	2,421
9.	Divided relatively with the Total Mileage of Regular Freight Train Locomotives in and outside of Michigan.	1,282,941		
10.	Outside Michigan	209,749	16.35	396
11.	Michigan	1,073,192	83.65	2,025
12.	Michigan Mixed, Line 5		100.00	32
13.	Divided relatively with the Mileage of Freight and Passenger Cars in Mixed Trains.			
14.	Freight		86.01	28
15.	Passenger		13.99	4
16.	System Special, Line 6		100.00	4
17.	Divided relatively with the Total Mileage of Special Train Locomotives in and outside of Michigan.	2,117		
18.	Outside Michigan	249	11.76	0
19.	Michigan	1,868	88.24	4
20.	Michigan Special, Line 19		100.00	4
21.	Divided relatively with the Michigan Mileage of Special Train Locomotives in Mixed and Passenger Services.	1,868		
22.	Mixed	1,443	77.25	3
23.	Passenger	425	22.75	1

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 399.—Other Supplies for Train Locomotives—Continued.

				%	$
24.	Michigan Special Mixed, Line 22			100.00	3
25.	Divided relatively with the Mileage of Freight and Passenger Cars in Mixed Trains.				
26.	Freight			72.86	2
27.	Passenger			27.15	1
28.	Michigan Special Passenger Recap:				
29.	Exclusive, Line 23				1
30.	Mixed, Line 27				1
31.	Total Michigan Special Passenger				2
32.	System Regular Passenger, Line 7			100.00	1,416
33.	Divided relatively with the Total Mileage of Regular DSS&A Passenger Train Locomotives in and outside of Michigan.		943,967		
34.	Outside Michigan		161,161	17.07	242
35.	Michigan		782,806	82.93	1,174
36.	Michigan Freight Recap:				
37.	Regular, Line 11				2,025
38.	Mixed, Line 14				28
39.	Special, Line 26				2
40.	Total Michigan Freight				2,055
41.	Michigan Passenger Recap:				
42.	Mixed, Line 15				4
43.	Special, Line 31				2
44.	Regular, Line 35				1,174
45.	Total Michigan Passenger				1,180
46.	Michigan Passenger, Line 45			100.00	1,180
47.	Divided on Michigan Passenger Gross Ton Miles, RatioN o. 1 b.				
48.	Sleepers and Diners			38.67	456
49.	Mail and Express			14.19	168
50.	Passenger and Baggage			47.14	556
51.	Michigan Passengers and Baggage, Line 50			100.00	556
52.	Divided on Michigan Passenger Miles, Ratio No. 10				
53.	Interstate			29.33	163
54.	Intrastate			70.67	393

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 400.—Enginehouse Expenses—Train.

		%	$
1.	System Total, per Annual Report, $55,955; assigned to Michigan by Delf.		48,306
2.	Assigned to Services by Delf.		
3.	Freight		29,942
4.	Passenger		18,364
5.	Michigan Passenger, Line 4	100.00	18,364
6.	Divided on Michigan Passenger Gross Ton Miles, Ratio No. 1 b.		
7.	Sleepers and Diners	38.67	7,101
8.	Mail and Express	14.19	2,606
9.	Passengers and Baggage	47.14	8,657
10.	Michigan Passengers and Baggage, Line 9	100.00	8,657
11.	Divided on Michigan Passenger Miles, Ratio No. 10		
12.	Interstate	29.33	2,539
13.	Intrastate	70.67	6,118

NOTE.—All divided on basis of Engines handled at each particular Enginehouse.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 401. Trainmen.

			%	$
1.	System Total, per Annual Report			235,476
2.	Assigned to Services by Delf:			
3.	Freight			170,836
4.	Passenger			64,640
5.	System Freight, Line 3		100.00	170,836
6.	Divided relatively with the Total Mileage of Freight Trains (including proportion of Mixed and Special) plus Train Switching, in and outside of Michigan	1,184,188		
7.	Outside Michigan	202,368	17.09	29,196
8.	Michigan	981,820	82.91	141,640
9.	System Passenger, Line 4		100.00	64,640
10.	Divided relatively with the Total Mileage of D., S. S. & A. Passenger Trains (including proportion of Mixed and Special), plus Train Switching, in and outside of Michigan, and on Mineral Range and D., S. S. & A.	955,468		
11.	Outside Michigan	158,178	16.56	10,704
12.	Michigan—M. R.	43,410(a)	4.54	2,935
13.	Michigan—D., S. S. & A.	753,880	78.90	51,001
14.	Michigan D., S. S. & A. Passenger, Line 13		100.00	51,001
15.	Divided on Passenger Trainmen's Pay Roll, Ratio No. 17a:			
16.	Conductors		53.53	27,301
17.	Brakemen		28.53	14,550
18.	Baggagemen (all Passengers and Baggage)		17.94	9,150
19.	Michigan Passenger-train Conductors Line 16			27,301
20.	50% to Passenger and Baggage			13,651
21.	50 to Common Train Operation			13,650
22.	Michigan Common Passenger Train Operation Recap:			
23.	Brakemen, Line 17			14,550
24.	50% Conductors, Line 21			13,650
25.	Total Michigan Common Passenger Train Operations			28,200
26.	Michigan Common Passenger-train Operations, Line 25		100.00	28,200
27.	Divided on Michigan D. S. S. & A. Passenger-train Car-miles, Ratio No. 3a:			
28.	Sleepers and Diners		28.78	8,116
29.	Mail and Express		15.05	4,244
30.	Passengers and Baggage		56.17	15,840
31.	Michigan Passengers and Baggage Recap:			
32.	Baggagemen, Line 18			9,150
33.	50% Conductors, Line 20			13,651
34.	Common, Line 30			15,840
35.	Total Michigan Passengers and Baggage			38,641
36.	Michigan Passengers and Baggage, Line 35		100.00	38,641
37.	Divided on Michigan Passenger Miles, Ratio No. 10.			
38.	Interstate		29.33	11,333
39.	Intrastate		70.67	27,308

(a) Mileage of D. S. S. & A. Locomotives taken as Train Miles.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 402.—Train Supplies and Expenses.

			%	$
1.	System Total, per Annual Report			42,403
2.	Assigned to Services by Delf.			
3.	Freight			9,983
4.	Passenger			32,420
5.	System Freight, Line 3		100.00	9,983
6.	Divided relatively with the Total Mileage of Freight Trains (including proportions of Mixed and Special), plus Train Switching, in and outside of Michigan	1,184,188		
7.	Outside Michigan	202,368	17.09	1,706
8.	Michigan	981,820	82.91	8,277
9.	System Passenger, Line 4		100.00	32,420
10.	Divided relatively with the Total Mileage of DSS&A Passenger Trains (including proportion of Mixed and Special), plus Train Switching, in and outside of Michigan, and on Mineral Range and DSS&A.	955,468		
11.	Outside Michigan	159,178	16.56	5,369
12.	Michigan–M.R.	43,410(a)	4.54	1,472
13.	Michigan–D.S.S.&A.	753,880	78.90	25,579
14.	Michigan D.S.S.&A. Passenger, Line 13		100.00	25,579
15.	Divided on Michigan DSS&A Passenger Train Car Miles, Ratio No. 3 a.			
16.	Sleepers and Diners		28.78	7,361
17.	Mail and Express		15.05	3,850
18.	Passengers and Baggage		56.17	14,368
19.	Michigan Passengers and Baggage, Line 18		100.00	14,368
20.	Divided on Michigan Passenger Miles, Ratio No. 10			
21.	Interstate		29.33	4,214
22.	Intrastate		70.67	10,154

(a)—Mileage of DSS&A Locomotives taken as Train Miles.

PAGE CUT OFF

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 403. Operating Sleeping Cars.

1.	System Total, per Annual Report, $14,455; allocated to Michigan by Delf	$11,017

All Sleepers and Diners.

No. 404. Signal and Interlocker Operation.

		%	$
1.	System Total, per Annual Report, $1,364; allocated to Michigan	100.00	31
2.	Divided as per data on page following Account No. 405		
3.	Freight	94.76	29
4.	Passenger	5.24	2
5.	Michigan Passenger, Line 4	100.00	2
6.	Divided on Michigan Total Passenger-train Car Miles, Ratio No. 3		
7.	Sleepers and Diners	28.13	1
8.	Mail and Express	14.68	0
9.	Passengers and Baggage	57.19	1
10.	Michigan Passengers and Baggage, Line 9	100.00	1
11.	Divided on Michigan Passenger Lines, Ratio No. 10		
12.	Interstate	29.33	0
13.	Intrastate	70.67	1

NOTE.—The Michigan portion of this charge is for Fuel.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 405. Crossing Protection.

		%	$
1.	System Total, per Annual Report, $9,664; allocated to Michigan	100.00	9,184
2.	Divided as per data on following page		
3.	Freight	94.76	8,703
4.	Passenger	5.24	481
5.	Michigan Passenger, Line 4	100.00	481
6.	Divided on Michigan Total Passenger-train Car-miles, Ratio No. 3		
7.	Sleepers and Diners	28.13	135
8.	Mail and Express	14.68	71
9.	Passengers and Baggage	57.19	275
10.	Michigan Passengers and Baggage, Line 9	100.00	275
11.	Divided on Michigan Passenger Miles Ratio No. 10		
12.	Interstate	29.33	81
13.	Intrastate	70.67	194

NOTE.—The Michigan portion of this charge is made up of the following:

Marquette	$5,458.04
Negaunee	1,848.29
Ishpeming	1,330.25
St. Ignace	485.25
Houghton	21.00
Fuel	40.94
Total	$9,183.77

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Data for Dividing Accounts
Nos. 404 and 405.

Data is based on the following:

(a) An examination of the Despatcher's Daily Train Register for one week in July, 1915, and one week in January, 1916, from which we were able to ascertain the number of trains, class of service and approximate amount of time spent by each in the protected areas at Negaunee and Ishpeming, and the number and class of Service of trains, entering and leaving Marquette and St. Ignace.

(b) The estimating of amounts of time for train and train locomotive movements at Marquette and St. Ignace, for trains for which no other approximation of time could be had, as follows:

		Minutes
St. Ignace:	Passenger Trains East and West Bound in Yard Limits	2
	Passenger Locomotives to or from Roundhouse	2
	Freight Trains Departing	4
	Freight Locomotives to or from Roundhouse	2
Marquette:	Passenger Trains East or West Bound to and from Yard Limits	5
	Passenger Locomotives to or from Roundhouse	5
	Freight Trains East or West Bound Departures	5
	Freight Trains West Bound Arrivals	10
	Freight Trains East Bound Arrivals	20
	Freight Locomotives to or from Roundhouse	10
	Ore Trains, in or out	5
	Ore Trains Locomotives, all movements	10
Yard switching at all points per statistical mile		10

		Minutes	%
Results,	Passenger Time	5 481	5.24
	Freight Time	99 054	94.76
	Total	104 535	100.00

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 407.—Telegraph and Telephone Operation.

			%	$
1.	System Total, per Annual Report		100.00	108
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 372 to 420 inclusive, except 407 and 410 (see detail page following Account No. 371).	$1,525,188		
3.	Outside Michigan	239,655	15.71	17
4.	Michigan	1,285,533	84.29	91
5.	Michigan Total, Line 4		100.00	91
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$1,251,911		
7.	Freight	929,755	74.27	68
8.	Passenger	322,156	25.73	23
9.	Michigan Passenger, Line 8		100.00	23
10.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$ 322,156		
11.	Sleepers and Diners	107,936	33.50	8
12.	Mail and Express	39,737	12.34	3
13.	Passengers and Baggage	174,483	54.16	12
14.	Michigan Passengers and Baggage, Line 13		100.00	12
15.	Divided on Michigan Passenger Miles, Ratio No. 10.			
16.	Interstate		29.33	4
17.	Intrastate		70.67	8

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 410. Stationery and Printing.

			%	$
1.	System Total, per Annual Report		100.00	16,085
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in Accounts 372 to 420 inclusive, except 407 and 410 (see detail page following Account No. 371)	$1,525,188		
	Outside Michigan	239,655	15.71	2,527
4.	Michigan	1,285,533	84.29	13,558
5.	Michigan Total, Line 4		100.00	13,558
6.	Divided relatively with Delf's 1917 allocation of this account to System Services	$ 16,085		
7.	Freight	7,533	46.83	6,349
8.	Common Freight and Passenger	4,800	29.84	4,046
9.	Passenger	3,752	23.33	3,163
10.	Michigan Common, Line 8		100.00	4,046
11.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$1,251,911		
12.	Freight	929,755	74.27	3,005
13.	Passenger	322,156	25.73	1,041
14.	Michigan Freight Recap.:			
15.	Exclusive, Line 7			6,349
16.	Common, Line 12			3,005
17.	Total Michigan Freight			9,354
18.	Michigan Passenger Recap.:			
19.	Exclusive, Line 9			3,163
20.	Common, Line 13			1,041
21.	Total Michigan Passenger			4,204

No. 410. Stationery and Printing (Continued).

			%	$
22.	Michigan Passenger, Line 21		100.00	4,204
23.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$322,156		
24.	Sleepers and Diners	107,936	33.50	1,408
25.	Mail and Express	39,737	12.34	519
26.	Passengers and Baggage	174,483	54.16	2,277
27.	Michigan Passengers and Baggage, Line 26		100.00	2,277
28.	Divided on Michigan Passenger Miles, Ratio No. 10			
29.	Interstate		29.33	668
30.	Intrastate		70.67	1,609

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 411. Other Expenses.

			%	$
1.	System Total, per Annual Report, $1,778; allocated to Michigan			1,509
2.	Allocated to Services			
3.	Freight			1,468
4.	Common Freight and Passenger			29
5.	Passenger			12
6.	Michigan Common, Line 4		100.00	29
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405, inclusive, 418 and 419 (see detail page following Account No. 371)	$1,251,911		
8.	Freight	929,755	74.27	22
9.	Passenger	322,156	25.73	7
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			1,468
12.	Common, Line 8			22
13.	Total Michigan Freight			1,490
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			12
16.	Common, Line 9			7
17.	Total Michigan Passenger			19
18.	Michigan Passenger, Line 17		100.00	19
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$322,156		
20.	Sleepers and Diners	107,936	33.50	7
21.	Mail and Express	39,737	12.34	2
22.	Passengers and Baggage	174,483	54.16	10
23.	Michigan Passenger and Baggge, Line 22		100.00	10
24.	Divided on Michigan Passenger Miles, Ratio No. 10			
25	Interstate		29.33	3
26.	Intrastate		70.67	7

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 412. Operating Joint Tracks and Facilities—Dr.

			%	$
1.	System Total, per Annual Report, $4,228; allocated to Michigan by Delf.			1,041
2.	Allocated to Services by Delf.			
3.	Freight			849
4.	Common Freight and Passenger			137
5.	Passenger (Soo Bridge)			55
6.	Michigan Common, Line 4		100.00	137
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405, inclusive, 418 and 419 (see detail page following Account No. 371	$1,251,911		
8.	Freight	929,755	74.27	102
9.	Passenger	322,156	25.73	35
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			849
12.	Common, Line 8			102
13.	Total Michigan Freight			951
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			55
16.	Common, Line 9			35
17.	Total Michigan Passengers			90
18.	Michigan Passenger, Line 17			90
19.	Allocated to Interstate Passengers and Baggage, account of Soo Bridge			55
20.	Balance			35
21.	Michigan Passenger, other than Soo Bridge, Line 20		100.00	35
22.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405, inclusive, 418 and 419 (see detail page following Account No. 371)	$322,156		
23.	Sleepers and Diners	107,936	33.50	12
24.	Mail and Express	39,737	12.34	4
25.	Passengers and Baggage	174,483	54.16	19

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 412. Operating Joint Tracks and Facilities—Dr.—Continued.

		%	$
26.	Michigan Passengers and Baggage, other than Soo Bridge, Line 25	100.00	19
27.	Divided on Michigan Passenger Miles, Ratio No. 10		
28.	Interstate	29.33	6
29.	Intrastate	70.67	13
30.	Michigan Interstate Passengers and Baggage Recap.:		
31.	Soo Bridge, Line 19		55
32.	Other, Line 28		6
33.	Total Michigan Interstate Passengers and Baggage		61

NOTE.—The Michigan Common portion of this charge is made up of the following:

Supplies, Sidnaw Station	$134.09
Crossing Gates, Ishpeming	3 07
Total	$137.16

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 413. Operating Joint Tracks and Facilities—Cr.

			%	$
1.	System Total, per Annual Report, *$5,454; allocated to Michigan			*3,884
2.	Allocated to Services			
3.	Freight			*2,287
4	Common Freight and Passenger			*784
5.	Passenger			*813
6.	Michigan Common, Line 4		100.00	*784
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405, inclusive, 418 and 419 (see detail page following Account No. 371)	$1,251,911		
8.	Freight	929,755	74.27	*582
9.	Passenger	322,156	25.73	*202
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			*2,287
12.	Common, Line 8			*582
13.	Total Michigan Freight			*2,869
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			*813
16.	Common, Line 9			*202
17.	Total Michigan Passenger			*1,015
18.	Michigan Passenger, Line 17		100.00	*1,015
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405, inclusive, 418 and 419 (see detail page following Account No. 371)	$322,156		
20.	Sleepers and Diners	107,936	33.50	*340
21.	Mail and Express	39,737	12.34	*125
22.	Passengers and Baggage	174,483	54.16	*550

*Typewritten in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 413, Operating Joint Tracks and Facilities—Cr. (Continued).

23.	Michigan Passengers and Baggage, Line 22	100.00	*550
24.	Divided on Michigan Passenger Miles, Ratio No. 10		
25.	Interstate	29.33	*161
26.	Intrastate	70.67	*389

NOTE.—The Michigan Common portion of this charge is made up of the following:

Station Supplies and Expenses at Joint Stations	$445.58
Station Service, Chassell	90.00
Water Station, Michigamme	248.67
Total	$784.25

*Typewritten in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 414. Insurance.

			%	$
1.	System Total, per Annual Report, $1,251; allocated to Michigan by Delf.			1,095
2.	Allocated to Services by Delf.			
3.	Freight			909
4.	Common Freight and Passenger			120
5.	Passenger			66
6.	Michigan Common, Line 4		100.00	120
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405, inclusive, 418 and 419 (see detail page following Account No. 371)	$1,251,911		
8.	Freight	929,755	74.27	89
9.	Passenger	322,156	25.73	31
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			909
12.	Common, Line 8			89
13.	Total Michigan Freight			908
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			66
16.	Common, Line 9			31
17.	Total Michigan Passenger			97
18.	Michigan Passenger, Line 17		100.00	97
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405, inclusive, 416 and 419 (see detail page following Account No. 371)	$322,156		
20.	Sleepers and Diners	107,936	33.50	32
21.	Mail and Express	39,737	12.34	12
22.	Passengers and Baggage	174,483	54.16	53
23.	Michigan Passengers and Baggage, Line 22		100.00	53
24.	Divided on Michigan Passenger Miles, Ratio No. 10			
25.	Interstate		29.33	16
26.	Intrastate		70.67	37

NOTE.—Common is Agents' bonds and Miscellaneous Transportation Items.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 415. Clearing Wrecks.

			%	$
1.	System Total, per Annual Report, $5,785; allocated to Michigan			3,951
2.	Allocated to Services			
3.	Freight			3,518
4.	Passenger			433
5.	Michigan Passenger, Line 4		100.00	433
6.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405, inclusive, 418 and 419 (see detail page following Account No. 371)	$322,156		
7.	Sleepers and Diners	107,936	33.50	145
8.	Mail and Express	39,737	12.34	53
9.	Passengers and Baggage	174,483	54.16	235
10.	Michigan Passenger and Baggage, Line 9		100.00	235
11.	Divided on Michigan Passenger Miles, Ratio No. 10			
12.	Interstate		29.33	69
13.	Intrastate		76.67	166

NOTE.—Of this charge, $5.79 was unallocated to State and Services. We have assigned this amount relatively to States and Services, $3.95 to Michigan, and $0.43 to Passenger.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 416. Damage to Property.

			%	$
1.	System Total, per Annual Report, $265; allocated to Michigan by Delf.			265
2.	Allocated to Services by Delf.			
3.	Freight			153
4.	Common Freight and Passenger			108
5.	Passenger			4
6.	Michigan Common, Line 4		100.00	108
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405, inclusive, 418 and 419 (see detail page following Account No. 371)	$1,251,911		
8.	Freight	929,755	74.27	80
9.	Passenger	322,156	25.73	28
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			153
12.	Common, Line 8			80
13.	Total Michigan Freight			233
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			4
16.	Common, Line 9			28
17.	Total Michigan Passenger			32
18.	Michigan Passenger, Line 17		100.00	32
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405, inclusive, 418 and 419 (see detail page following Account No. 371)	$322,156		
20.	Sleepers and Diners	107,936	33.50	11
21.	Mail and Express	39,737	12.34	4
22.	Passengers and Baggage	174,483	54.16	17
23.	Michigan Passengers and Baggage, Line 22		100.00	17
24.	Divided on Michigan Passenger Miles, Ratio No. 10			
25.	Interstate		29.33	5
26.	Intrastate		70.67	12

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 417: Damage to Live Stock on Right of Way.

			%	$
1.	System Total, per Annual Report, $479; allocated to Michigan by Delf			389
2.	Allocated to Services by Delf			
3.	Freight			104
4.	Passenger			285
5.	Michigan Passenger, Line 4		100.00	285
6.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 to 419 (see detail page following Account No. 371)	$322,156		
7.	Sleepers and Diners	107,936	33.50	95
8.	Mail and Express	39,737	12.34	35
9.	Passengers and Baggage	174,483	54.16	155
10.	Michigan Passengers and Baggage, Line 9		100.00	155
11.	Divided on Michigan Passenger Miles, Ratio No. 10			
12.	Interstate		29.33	45
13.	Instrastate		70.67	110

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 418. Loss and Damage—Freight.

1.	System Total, per Annual Report, $9,333; allocated to Michigan by Delf.	$7,673

All Freight.

No. 419.—Loss and Damage—Baggage.

		%	$
1.	System Total, per Annual Report, $220; allocated to Michigan by Delf. (all Passengers and Baggage)		207
2.	Michigan Passengers and Baggage, Line 1	100.00	207
3.	Divided on Michigan Passenger Lines, Ratio No. 10		
4.	Interstate	29.33	61
5.	Intrastate	70.67	146

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 420. Injuries to Persons.

			%	$
1.	System Total, per Annual Report, $32,765; allocated to Michigan			$14,914
2.	Allocated to Services			
3.	Freight			13,478
4.	Common Freight and Passenger			284
5.	Passenger			1,152
6.	Michigan Common, Line 4		100.00	284
7.	Divided relatively with the total of charges to Michigan Freight and Passenger in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$1,251,911		
8.	Freight	929,755	74.27	211
9.	Passenger	322,156	25.73	73
10.	Michigan Freight Recap.:			
11.	Exclusive, Line 3			13,478
12.	Common, Line 8			211
13.	Total Michigan Freight			13,689
14.	Michigan Passenger Recap.:			
15.	Exclusive, Line 5			1,152
16.	Common, Line 9			73
17.	Total Michigan Passenger			1,225
18.	Michigan Passenger, Line 17		100.00	1,225
19.	Divided relatively with the total of charges to Michigan Passenger Services in Accounts 372 to 405 inclusive, 418 and 419 (see detail page following Account No. 371)	$322,156		
20.	Sleepers and Diners	107,936	33.50	410
21.	Mail and Express	39,737	12.34	151
22.	Passengers and Baggage	174,483	54.16	664
23.	Michigan Passenger and Baggage, Line 22		100.00	664
24.	Divided on Michigan Passenger Miles, Ratio No. 10			
25.	Interstate		29.23	195
26.	Intrastate		70.67	469

VI. Miscellaneous Operations.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

VI. MISCELLANEOUS OPERATIONS.

No. 441. Dining and Buffet Service.

1. System Total, per Annual Report, $50,588; allocated to Michigan by Delf. $41,319

All Sleepers and Diners.

VII. General.

VII. General

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

VII. GENERAL.

No. 451. Salaries and Expenses of General Officers.

			%	$
1.	System Totals, per Annual Report		100.00	30,367
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following)	$2,930,118		
3.	Outside Michigan	500,611	17.09	5,190
4.	Michigan	2,429,507	82.91	25,177
5.	Michigan Total, Line 4		100.00	25,177
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following	$2,429,507		
7.	Freight	1,803,820	74.25	18,694
8.	Passenger	625,687	25.75	6,483
9.	Michigan Passenger, Line 8		100.00	6,483
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following)	$625,687		
11.	Sleepers and diners	224,698	35.91	2,328
12.	Mail and Express	74,654	11.93	773
13.	Passengers and Baggage	326,335	52.16	3,382
14.	Michigan Passenger and Baggage, Line 13		100.00	3,382
15.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following)	$326,335		
16.	Interstate	104,855	32.13	1,087
17.	Intrastate	221,480	67.87	2,295

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Details for Dividing Accounts 451, 452, 453, 454, 455, 457, 458, 459, 460 and 461.

Acct.	System Total excluding Mineral Range.	Outside Michigan	MICHIGAN, excluding Mineral Range.							
					PASSENGER.					
								Passengers and Baggage.		
			Total	Freight	Total	Sleepers & Diners	Mail & Express	Total	Inter-state	Intra-state
I.	$ 743,959	$150,554	$ 593,405	$ 477,457	$115,948	$40,619	$16,366	$58,963	$17,300	$41,663
II.	497,831	79,971	417,860	313,724	104,136	31,508	17,304	55,324	16,228	39,096
III.	87,145	14,915	72,230	40,154	32,076			32,076	18,500	13,576
IV.	1,550,595	245,902	1,304,693	972,485	332,208	111,252	40,984	179,972	52,827	127,145
VI	50,588	9,269	41,319		41,319	41,319				
	2,930,118	500,611	2,429,507	1,803,820	625,687	224,698	74,654	326,335	104,855	221,480

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 452. Salaries and Expenses of Clerks and Attendants.

			%	$
1.	System Total, per Annual Report		100.00	35,612
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,930,118		
3.	Outside Michigan	500,611	17.09	6,086
4.	Michigan	2,429,507	82.91	29,526
5.	Michigan Total, Line 4		100.00	29,526
6.	Divided relatively with Delf's allocation to System Services in this account	$35,612		
7.	Freight	12,147	34.11	10,071
8.	Common Freight and Passenger	16,392	46.03	13,591
9.	Passenger	7,073	19.86	5,864
10.	Michigan Common, Line 8		100.00	13,591
11.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,429,507		
12.	Freight	1,803,820	74.25	10,091
13.	Passenger	625,687	25.75	3,500
14.	Michigan Freight Recap.:			
15.	Exclusive, Line 7			10,071
16.	Common, Line 12			10,091
17.	Total Michigan Freight			20,162
18.	Michigan Passenger Recap.:			
19.	Exclusive, Line 9			5,864
20.	Common, Line 13			3,500
21.	Total Michigan Passenger			9,364

No. 452. Salaries and Expenses of Clerks and Attendants (Continued).

			%	$
22.	Michigan Passenger, Line 21		100.00	9,364
23.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$625,687		
24.	Sleepers and Diners	224,698	35.91	3,363
25.	Mail and Express	74,654	11.93	1,117
26.	Passengers and Baggage	326,335	52.16	4,884
27.	Michigan Passengers and Baggage, Line 26		100.00	4,884
28.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$325,835		
29.	Interstate	104,355	32.13	1,569
30.	Intrastate	221,480	67.87	3,315

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 453. General Office Supplies and Expenses.

			%	$
1.	System Total, per Annual Report			$4,276
2.	Assigned to States by Delf			
3.	Outside Michigan (all Freight)			0
4.	Common Michigan and Outside Michigan			4,275
5.	Michigan (all Freight)			1
6.	Common Michigan and Outside Michigan, Line 4		100.00	4,275
7.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,930,118		
8.	Outside Michigan	500,611	17.09	731
9.	Michigan	2,429,507	82.91	3,544
10.	Michigan Common, Line 9		100.00	3,544
11.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,429,507		
12.	Freight	1,803,820	74.25	2,631
13.	Passenger	625,687	25.75	913
14.	Michigan Freight Recap.:			
15.	Exclusive, Line 5			1
16.	Common, Line 12			2,631
17.	Total Michigan Freight			2,632

No. 453. General Office Supplies and Expenses (Continued).

			%	$
18.	Michigan Passenger, Line 13		100.00	913
19.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$625,687		
20.	Sleepers and Diners	225,698	35.91	328
21.	Mail and Express	74,654	11.93	109
22.	Passengers and Baggage	326,335	52.16	476
23.	Michigan Passengers and Baggage, Line 22		100.00	476
24.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$326,335		
25.	Interstate	104,855	32.13	153
26.	Intrastate	221,480	67.87	323

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 454. Law Expenses.

			%	$
1.	System Total, per Annual Report			15,754
2.	Less cost of this suit			4,645
3.	Balance			11,109
4.	System Total, other than cost of suit, Line 3			11,109
5.	Assigned to States by Delf.			
6.	Outside Michigan			183
7.	Common Michigan and Outside Michigan			10,258
8.	Michigan			668
9.	Common Michigan and Outside Michigan, Line 8		100.00	10,258
10.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,930,118		
11.	Outside Michigan	500,611	17.09	1,753
12.	Michigan	2,429,507	82.91	8,505
13.	Common Michigan, Line 12		100.00	8,505
14.	Divided relatively with Delf's allocation to System Services in this account	$ 10,258		
15.	Freight	59	.57	49
16.	Common Freight and Passenger	9,989	97.38	8,282
17.	Passenger	210	2.05	174
18.	Exclusive Michigan, Line 8			668
19.	Allocated to Services by Delf.			
20.	Freight			105
21.	Common Freight and Passenger			36
22.	Passenger			527
23.	Michigan Common Freight and Passenger Recap:			
24.	Common Michigan, Line 16			8,282
25.	Exclusive Michigan, Line 21			36
26.	Total Michigan Common Freight and Passenger			8,318

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 454. Law Expenses (Continued).

			%	$
27.	Michigan Common, Line 26		100.00	8,318
28.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, II, IV and VI (see detail page following Account No. 451)	$2,429,507		
29.	Freight	1,803,820	74.25	6,176
30.	Passenger	625,687	25.75	2,142
31.	Michigan Freight Recap.:			
32.	Exclusive, Line 15			49
33.	Exclusive, Line 20			105
34.	Common, Line 29			6,176
35.	Total Michigan Freight			6,330
36.	Michigan Passenger Recap.:			
37.	Exclusive, Line 17			174
38.	Exclusive, Line 22			527
39.	Common, Line 30			2,142
40.	Total Michigan Passenger			2,843
41.	Michigan Passenger, Line 40			2,843
42.	Allocated to Mail and Express, account of DSS&A proportion of Expenses of Washington Law Firm (Note)			174
43.	Balance			2,669
44.	Michigan Passenger other than Expenses of Washington Law Firm		100.00	2,669
45.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV anVd VI (see detail page following Account No. 451)	$625,687		
46.	Sleepers and Diners	224,698	35.91	958
47.	Mail and Express	74,654	11.93	319
48.	Passengers and Baggage	326,335	52.16	1,392

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 454. Law Expenses (Continued).

			%	$
49.	Michigan Mail and Express Recap.:			
50.	Expenses of Washington Law Firm, Line 42			174
51.	Other, Line 47			319
52.	Total Michigan Mail and Express			493
53.	Michigan Passengers and Baggage, Line 48		100.00	1,392
54.	Divided relatively with th etotal of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$326,335		
55.	Interstate	104,855	32.13	447
56.	Intrastate	221,480	67.87	945

NOTE.—This charge is $210.00 for the system, $82.91 has been brought into Michigan, or $174.00.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 455. Insurance.

			%	$
1.	System Total, per Annual Report		100.00	117
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,930,118		
3.	Outside Michigan	500,611	17.09	20
4.	Michigan	2,429,507	82.91	97
5.	Michigan Total, Line 4		100.00	97
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,429,507		
7.	Freight	1,803,820	74.25	72
8.	Passenger	625,687	25.75	25
9.	Michigan Passenger, Line 8		100.00	25
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$625,687		
11.	Sleepers and Diners	224,698	35.91	9
12.	Mail and Express	74,654	11.93	3
13.	Passengers and Baggage	326,335	52.16	13
14.	Michigan Passengers and Baggage, Line 13		100.00	13
15.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$326,335		
16.	Interstate	104,855	32.13	4
17.	Intrastate	221,480	67.87	9

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 457.—Pensions.

			%	$
1.	System Total, per Annual Report		100.00	1,367
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,930,118		
3.	Outside Michigan	500,611	17.09	234
4.	Michigan	2,429,507	82.91	1,133
5.	Michigan Total, Line 4		100.00	1,133
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,429,507		
7.	Freight	1,803,820	74.25	841
8.	Passenger	625,687	25.75	292
9.	Michigan Passenger, Line 8		100.00	292
10.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$625,687		
11.	Sleepers and Diners	224,698	35.91	105
12.	Mail and Express	74,654	11.93	35
13.	Passengers and Baggage	326,335	52.16	152
14.	Michigan Passengers and Baggage, Line 13		100.00	152
15.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$326,335		
16.	Interstate	104,855	32.13	49
17.	Intrastate	221,480	67.87	103

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 458. Stationery and Printing.

			%	$
1.	System Total, per Annual Report		100.00	6,712
2.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,930,118		
3.	Outside Michigan	500,611	17.09	1,147
4.	Michigan	2,429,507	82.91	5,565
5.	Michigan Total, Line 4		100.00	5,565
6.	Divided relatively with Delf's allocation to System Services in this account	$ 6,712		
7.	Freight	654	9.74	542
8.	Common Freight and Passenger	5,784	86.18	4,796
9.	Passenger	274	4.08	227
10.	Michigan Common, Line 8		100.00	4,796
11.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,429,507		
12.	Freight	1,803,820	74.25	3,561
13.	Passenger	625,687	25.75	1,235
14.	Michigan Freight Recap.:			
15.	Exclusive, Line 7			542
16.	Common, Line 12			3,561
17.	Total Michigan Freight			4,103
18.	Michigan Passenger Recap.:			
19.	Exclusive, Line 9			227
20.	Common, Line 13			1,235
21.	Total Michigan Passenger			1,462

No. 458. Stationery and Printing (Continued)

			%	$
22.	Michigan Passenger, Line 21		100.00	1,462
23.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$625,687		
24.	Sleepers and Diners	224,698	35.91	525
25.	Mail and Express	74,654	11.93	174
26.	Passengers and Baggage	326,335	52.16	763
27.	Michigan Passengers and Baggage, Line 26		100.00	763
28.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	326,335		
29.	Interstate	104,855	32.13	245
30.	Intrastate	221,480	67.87	518

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 459. Valuation Expenses.

			%	$
1.	System Total, per Annual Report		100.00	6,701
2.	Divided relatively with the total mileage of all D. S. S. & A. Tracks in and outside of Michigan	770.09		
3.	Outside Michigan	130.76	16.98	1,138
4.	Michigan	639.33	83.02	5,563
5.	Michigan Total, Line 4		100.00	5,563
6.	Divided relatively with the total of charges to Michigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,429,507		
7.	Freight	1,803,820	74.25	4,131
8.	Passenger	625,687	25.75	1,432
9.	Michigan Passenger, Line 8		100.00	1,432
10.	Divided relatively with the total of Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$625,687		
11.	Sleepers and Diners	224,698	35.91	514
12.	Mail and Express	74,654	11.93	171
13.	Passengers and Baggage	326,335	52.16	747
14.	Michigan Passengers and Baggage, Line 13		100.00	747
15.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$326,335		
16.	Interstate	104,855	32.13	240
17.	Intrastate	221,480	67.87	507

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 460. Other Expenses.

			%	$
1.	System Total, per Annual Report			5,446
2.	Allocated to States by Delfs.			
3.	Outside Michigan			268
4.	Common Michigan and Outside Michigan			4,131
5.	Michigan			1,047
6.	Common Michigan and Outside Michigan, Line 4		100	4,131
7.	Divided relatively with the total of charges to Michigan and outside of Michigan in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,930,118		
8.	Outside Michigan	500,611	17.09	706
9.	Michigan	2,429,507	82.91	3,425
10.	Common Michigan, Line 9		100.00	3,425
11.	Divided relatively with Delf's allocation to System Services in this account	$ 4,131		
12.	Freight	182	4.41	151
13.	Common Freight and Passenger	3,835	92.83	3,179
14.	Passenger	114	2.76	95
15.	Michigan Common Freight and Passenger Recap.:			
16.	Exclusive, Michigan, Line 5			1,047
17.	Common Michigan, Line 13			3,179
18.	Total Michigan Freight and Passenger			4,226
19.	Michigan Common, Line 18		100.00	4,226
20.	Divided relatively with the total of charges to Micsigan Freight and Passenger in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$2,429,507		
21.	Freight	1,803,820	74.25	3,138
22.	Passenger	625,687	25.75	1,088

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 460. Other Expenses—Continued.

			%	$
23.	Michigan Freight Recap.:			
24.	Exclusive, Line 12			151
25.	Common, Line 21			3,138
26.	Total Michigan Freight			3,289
27.	Michigan Passenger Recap.:			
28.	Exclusive, Line 14			95
29.	Common, Line 22			1,088
30.	Total Michigan Passenger			1,183
31.	Michigan Passenger, Line 30			1,183
32.	Allocated to Mail and Express, account of Expenses of Short Line Railway Association (Note)			83
33.	Balance			1,100
34.	Michigan Passenger, other than Expenses of Short Line Railway Association		100.00	$1,100
35.	Divided relatively with the total of charges to Michigan Passenger Services in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$625,687		
36.	Sleepers and Diners	224,698	35.91	395
37.	Mail and Express	74,654	11.93	131
38.	Passengers and Baggage	326,335	52.16	574
39.	Michigan Mail and Express Recap.:			
40.	Expense of Short Line Railway Association, Line 32			83
41.	Other, Line 37			131
42.	Total Michigan Mail and Express			214
43.	Michigan Passengers and Baggage, Line 38		100.00	574
44.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$326,335		
45.	Interstate	104,855	32.13	184
46.	Intrastate	221,480	67.87	390

NOTE.—This charge is $100 for the System, of which 83.00% has been brought into Michigan, or $83.00.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

No. 461. General Joint Facilities—Dr.

			%	$
1.	System Total, per Annual Report, $556; allocated to Michigan by Delf.			78
2.	Allocated to Services by Delf.			
3.	Freight			60
4.	Passenger (All Passengers and Baggage)			18
5.	Michigan Passengers and Baggage, Line 4			18
6.	Allocated to Interstate, account of Soo Bridge			4
7.	Balance			14
8.	Michigan Passengers and Baggage, other than Soo Bridge, Line 7		100.00	14
9.	Divided relatively with the total of charges to Michigan Interstate and Intrastate in General Accounts I, II, III, IV and VI (see detail page following Account No. 451)	$326.335		
10.	Interstate	104,855	32.13	4
11.	Intrastate	221,480	67.87	10
12.	Michigan Interstate Passengers and Baggage Recap.:			
13.	Soo Bridge, Line 6			4
14.	Other, Line 10			4
15.	Total Michigan Interstate Passengers and Baggage			8

NOTE.—The Michigan Passenger portion of this charge is made of the following:

Soo Bridge	$ 3.75
Soo Union Depot	14.00
Total	17.75

Apportionments of Primary Expense Accounts

Summary

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Summary of Apportionment of Primary Expense Accounts.

Account	System Total	M	I	C	H	I	G	A	N	
				Mineral Range	D. S. S. & A. Passenger.					
		Total	Freight	Passenger	Total	Sleepers and Diners	Mail and Express	Passengers and Baggage.		
								Total	Interstate	Intrastate
I. MAINTENANCE OF WAY AND STRUCTURES:										
	$	$	$		$	$	$	$	$	$
201. Superintendence	27,129	21,595	17,144		4,451	1,559	629	2,263	664	1,599
202. Roadway Maintenance	67,154	51,502	41,543		9,959	2,801	1,462	5,696	1,671	4,025
208. Bridges, Trestles & Culverts	56,221	17,621	13,727		3,894	1,095	572	2,227	653	1,574
212. Ties	73,794	60,334	47,278		13,056	4,964	1,837	6,255	1,235	4,420
214. Rails	35,448	34,075	26,702		7,373	2,803	1,037	3,533	1,036	2,497
216. Other Track Material	36,880	30,616	23,991		6,625	2,519	932	3,174	931	2,243
218. Ballast	15,694	14,838	11,627		3,211	1,221	452	1,538	451	1,087
220. Track Laying and Surfacing	264,791	218,853	171,496		47,357	18,005	6,663	22,689	6,655	16,034
221. Right-of-Way Fences	7,515	5,799	4,677		1,122	316	165	641	188	453
223. Snow and Sand Fences and Snowsheds	796	757	611		146	41	21	84	25	59
225. Crossings and Signs	2,911	2,583	2,084		499	140	73	286	84	202
227. Station and Office Buildings	12,750	11,905	9,554		2,351		235	2,116	621	1,495
229. Roadway Buildings	6,363	6,197	4,856		1,341	510	189	642	188	454
231. Water Stations	6,834	5,769	4,121		1,648	639	233	776	228	548
233. Fuel Stations	8,542	7,211	5,152		2,059	798	291	970	285	685
235. Shops and Enginehouses	7,630	6,700	4,813		1,887	702	274	911	267	644
241. Wharves and Docks	2,878	2,878	1,765		1,113	368	144	601	176	425
243. Coal and Ore Wharves	17,285	17,285	17,285							
244. Coal and Ore Wharves—Depr.	19,146	19,146	19,146							
247. Telegraph and Tel. Lines	6,053	5,143	4,108		1,035	291	152	592	174	418
249. Signals and Interlockers	1,382	687	651		36	10	5	21	6	15
265. Miscellaneous Structures	58	52	41		11	4	1	6	2	4

THIS PAGE BOUND

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Summary of Apportionment of Primary Expense Accounts (Continued).

Account	System Total	M	I	C	H	I	G	A	N	
					D. S. S. & A. Passenger.					
		Total	Freight	Mineral Range Passenger	Total	Sleepers and Diners	Mail and Express	Passengers and Baggage. Total	Inter-state	Intra-state
I. MAINTENANCE OF WAY AND STRUCTURES—(Continued)										
	$	$	$	$	$	$	$	$	$	$
269. Roadway Machines	2,216	1,903	1,582		411	144	58	209	61	148
271. Small Tools and Supplies	9,322	7,767	6,166		1,601	561	226	814	239	575
272. Remov'g Snow, Ice and Sand	49,937	45,184	37,297		7,787	2,190	1,143	4,454	1,306	3,148
274. Injuries to Persons	2,472	2,202	1,784		418	146	59	213	62	151
275. Insurance	4,225	2,775	2,172		603	211	85	307	90	217
276. Stationery and Printing	972	774	614		160	56	23	81	24	57
277. Other Expenses	120	119	94		25	9	3	13	4	9
278. Maintaining Jt. Tracks, Yards and Other Facilities—Dr.	8,903	7,259	6,419		840	292	118	430	130	300
279. Maintaining Jt. Tracks, Yards and Other Facilities—Cr.	*16,273	*16,214	*11,143		$5,071	*1,776	*716	*2,579	*764	*1,823
Total Maintenance of Way and Structures	743,959	593,465	477,457		115,948	40,619	16,366	58,963	17,300	41,663
II. MAINTENANCE OF EQUIPMENT:										
301. Superintendence	13,349	11,365	8,047	140	3,078	876	524	1,678	492	1,186
302. Shop Machinery	3,856	3,317	6,016		2,301	655	392	1,254	368	886
308. Steam Locomotives—Repairs	127,267	108,260	67,380	2,123	38,757	14,990	5,470	18,297	5,367	12,930

*Typewritten in red.

THIS PAGE

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Summary of Apportionment of Primary Expense Accounts (Continued).

Account	System Total	M	I	C	H	I	G	A	N	
					D. S. S. & A. Passenger.					
		Total	Freight	Mineral Range Passenger	Total	Sleepers and Diners	Mail and Express	Passengers and Baggage. Total	Interstate	Intrastate
II. MAINTENANCE OF EQUIPMENT—(Continued).										
309. Steam Locomotives—Depr'n	$ 22,413	$ 19,111	$ 13,116	$ 304	$ 5,691	$ 2,207	$ 801	$ 2,683	$ 787	$ 1,896
310. Steam Locomotives—Retirem	136	117	113		5	2	1	2	1	1
314. Freight Train Cars—Repairs	160,334	136,214	136,214							
315. Freight Train Cars—Deprec'n	61,517	52,247	52,247							
316. Freight Train Cars—Retirem	17,233	14,636	14,636							
317. Pass'ger Train Cars—Repairs	50,613	41,854		1,586	40,268	7,241	8,061	24,866	7,293	17,573
318. Pass'ger Train Cars—Depr	12,367	10,094		279	9,815	4,027	1,417	4,371	1,282	3,089
326. Work Equipment—Repairs	14,208	11,216	8,938		2,278	811	324	1,143	335	808
327. Work Equipment—Deprec'n	3,670	2,897	2,309		588	209	84	295	87	208
328. Work Equipment—Retirem	278	219	175		44	16	6	22	6	16
332. Injuries to Persons	2,667	2,255	1,821		434	124	74	236	69	167
333. Insurance	2,500	2,148	1,669		479	136	82	261	77	184
334. Stationery and Printing	1,710	1,443	1,044		399	114	68	217	64	153
335. Maintaining Joint Equipment at Terminals—Dr.	1,997	1	1							
336. Maintaining Joint Equipment at Terminals—Cr.	*2	*2	*1		*1			*1		*1
Total Maintenance of Equipment	$ 502,263	$ 422,292	$ 313,724	$4,422	$104,136	$31,503	$17,304	$55,324	$16,228	$39,096

* Typewritten in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Summary of Apportionment of Primary Expense Accounts (Continued).

Account	System Total	M	I	C	H	I	G	A	N	
					D. S. S. & A. Passenger.					
				Mineral Range		Sleepers	Mail	Passengers and Baggage.		
		Total	Freight	Passenger	Total	and Diners	and Express	Total	Interstate	Intrastate
III. TRAFFIC:										
	$	$	$	$	$	$	$	$	$	$
351. Superintendence	32,164	26,500	14,802		11,698			11,698	3,431	8,267
352. Outside Agencies	32,715	26,957	14,404		12,553			12,553	11,553	1,000
353. Advertising	3,757	3,104	33		3,071			3,071	2,121	950
354. Traffic Associations	362	298	298							
355. Fast Freight Lines	7	6	6							
356. Industrial and Immigr. Bur.	9,128	7,983	5,695		2,288			2,288	671	1,617
357. Insurance	109	51	1		50			50	15	35
358. Stationery and Printing	8,903	7,231	4,915		2,416			2,416	709	1,707
Total Traffic	$87,145	$72,230	$40,154		$32,076			32,076	$18,500	$13,576
IV. TRANSPORTATION—RAIL LINE:										
371. Superintendence	23,736	20,033	15,194	180	4,659	1,528	589	2,542	746	1,796
372. Despatching Trains	14,584	12,393	9,898		2,495	702	366	1,427	419	1,008
373. Station Employees	194,131	174,817	152,828		21,989		2,199	19,790	5,804	13,986
374. Weighing, Inspection and Demurrage Bureaus	1,428	1,174	1,174							
375. Coal and Ore Wharves	26,636	26,636	26,636							
376. Station Supplies and Exp.	13,117	12,021	9,698		2,323			2,323	681	1,642
377. Yard Masters & Yard Clerks	5,221	5,221	5,115		106	61	2	43	13	30
378. Yard Conductors & Brakem	58,460	54,633	53,241		1,392	692	75	625	183	442
379. Yard Switching and Signal Tenders	4,915	4,877	4,731		146	84	3	59	17	42
380. Yard Enginemen	41,721	38,737	37,727		1,010	507	53	450	132	318

THIS PAGE I

Duluth South Shore & Atlantic Railway Company.
Fiscal Year 1917.

Summary of Apportionment of Primary Expense Accounts (Continued).

Account	System Total	M	I	C	H	I	G	A	N	
					D. S. S. & A. Passenger.					
		Total	Freight	Mineral Range Passenger	Total	Sleepers and Diners	Mail and Express	Passengers and Baggage.		
								Total	Interstate	Intrastate
IV. TRANSPORTATION—RAIL LINE (Continued)										
	$	$	$	$	$	$	$	$	$	$
382. Fuel for Yard Locomotives	44,126	40,214	39,146		1,068	524	60	484	142	342
385. Water for Yard Locomotives	1,218	936	910		26	13	1	12	4	8
386. Lubricants for Yard Locos	621	564	551		13	6	1	6	2	4
387. Other Suppl. for Yard Locos	568	547	537		10	5	0	5	1	4
388. Enginehouse Expenses—Yard	18,788	17,977	17,601		376	198	16	162	48	114
389. Yard Supplies and Expenses	1,443	1,374	1,332		42	24	1	17	5	12
390. Operating Jt. Yards and Terminals—Dr.	31,426	19,421	12,882		6,539	2,529	928	3,082	904	2,178
391. Operating Jt. Yards and Terminals—Cr.	*17,285	*17,280	*15,355		*1,925	*704	*267	*954	*280	*674
392. Train Enginemen	205,500	172,209	110,874	3,209	58,126	22,477	8,248	27,401	8,037	19,364
394. Fuel for Train Locomotives	440,587	368,996	248,710	6,288	113,998	44,083	16,176	53,739	15,762	37,977
397. Water for Trn. Locomotives	17,176	14,385	9,696	245	4,444	1,718	631	2,095	614	1,481
398. Lubricants for Train Locos	6,899	5,781	3,504	130	2,147	830	305	1,012	297	715
399. Other Supplies for Trn. Loc	3,936	3,298	2,055	63	1,180	456	168	556	163	393
400. Enginehouse Exp.—Train	55,955	48,306	29,942		18,364	7,101	2,606	8,657	2,539	6,118
401. Trainmen	235,476	195,576	141,640	2,935	51,001	8,116	4,244	33,641	11,333	27,308
402. Train Supplies and Exp.	42,403	35,328	8,277	1,472	25,579	7,361	3,850	14,368	4,214	10,154
403. Operating Sleeping Cars	14,455	11,017			11,017	11,017				
404. Signal & Interlocker—Op.	1,364	31	29		2	1	0	1	0	1
405. Crossing Protection	9,664	9,184	8,703		481	135	71	275	81	194

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Summary of Apportionment of Primary Expense Accounts (Continued).

Account	System Total	M	I	C	H	I	G	A	N	
		Total	Freight	Mineral Range Passenger	D. S. S. & A. Passenger.					
					Total	Sleepers and Diners	Mail and Express	Passengers and Baggage.		
								Total	Interstate	Intrastate
TRANSPORTATION—RAIL LINE— (Continued).										
407. Telegraph & Telephone Op.	$ 108	$ 91	$ 61	$	$ 23	$ 3	$ 3	$ 13	$ 4	$ 9
410. Stationery and Printing	16,035	13,553	9,264		4,304	1,406	519	2,277	642	1,635
411. Other Expenses	1,778	1,509	1,490		19	7	2	10	3	7
412. Operating Jt. Trks. and Facilities—Dr.	4,228	1,041	951		90	12	4	74	61	13
413. Operating Joint Tracks and Facilities—Cr.	*5,454	*3,884	*2,869		*1,015	*240	*125	*650	*161	*389
414. Insurance	1,251	1,096	995		97	33	12	52	16	37
415. Clearing Wrecks	5,785	3,951	3,513		433	145	53	235	69	166
416. Damage to Property	365	265	233		32	11	4	17	5	12
417. Damage to Live Stock on Rt.-of-Way	479	289	104		285	95	35	155	45	110
418. Loss and Damage—Freight	9,333	7,673	7,673							
419. Loss and Damage—Baggage	220	207			207			207	61	146
420. Injuries to Persons	32,765	14,914	12,689		1,225	410	151	664	195	469
Total Transportation—Rail Line	$1,865,117	$1,319,215	$ 972,485	$14,532	$332,208	$111,252	$40,984	$179,972	$52,827	$127,145
VI. MISCELLANEOUS OPERATIONS:										
441. Dining and Buffet Service	50,538	41,319			41,319	41,319				

* Typewritten in red.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Summary of Apportionment of Primary Expense Accounts (Continued).

Account	System Total	M	I	C	H	I	G	A	N	
		Total	Freight	Mineral Range Passenger	D. S. S. & A. Passenger.					
					Total	Sleepers and Diners	Mail and Express	Passengers and Baggage.		
								Total	Interstate	Intrastate
VII. GENERAL:										
451. Salaries and Expenses of General Officers	$ 30,267	$ 25,177	$ 18,694		$ 6,483	$ 2,328	$ 773	$ 3,282	$ 1,087	$ 2,195
452. Salaries and Expenses of Clerks and Attendants	25,612	29,526	20,162		9,364	3,363	1,117	4,834	1,569	3,315
453. Gen. Office Supplies & Exp.	4,276	3,545	2,632		913	328	109	476	153	323
454. Law Expenses	11,109(a)	9,173	6,330		2,843	968	493	1,382	447	945
455. Insurance	117	97	72		25	9	3	13	4	9
457. Pensions	1,267	1,132	841		282	105	35	152	49	103
458. Stationery and Printing	6,712	5,565	4,103		1,462	525	174	763	245	518
459. Valuation Expenses	6,701	5,563	4,131		1,432	514	171	747	240	507
460. Other Expenses	5,446	4,472	3,289		1,183	395	214	574	184	390
461. General Jt. Facilities—Dr.	556	78	60		18			18	8	10
462. General Jt. Facilities—Cr.										
Total General Expenses	$ 102,263	$ 84,329	$ 60,314		$24,015	$8,525	$3,089	$12,401	$3,986	$8,415
RECAPITULATION:										
I. Mainten. of Way and Struc.	743,959	593,405	477,457		115,948	40,619	16,366	56,963	17,300	41,663
II. Maintenance of Equipment	502,263	422,292	313,724	4,432	104,136	31,508	17,204	55,324	16,228	39,096
III. Traffic	87,145	73,230	40,154		33,076			33,076	13,500	19,576
IV. Transportation	1,565,117	1,319,215	972,485	14,522	332,208	111,252	40,964	179,972	52,827	127,145
VI. Miscellaneous Operations	50,588	41,319			41,319	41,319				
VII. General	102,263	84,329	60,314		24,015	8,525	3,089	12,401	3,986	8,415
GRAND TOTAL	$3,051,335	$2,533,790	$1,864,134	$18,954	$649,702	$223,223	$77,748	$338,736	$108,841	$229,895

(a) This account excludes on account of Cost of Suit, $4,645.

Apportionments of Revenues Details and Summary

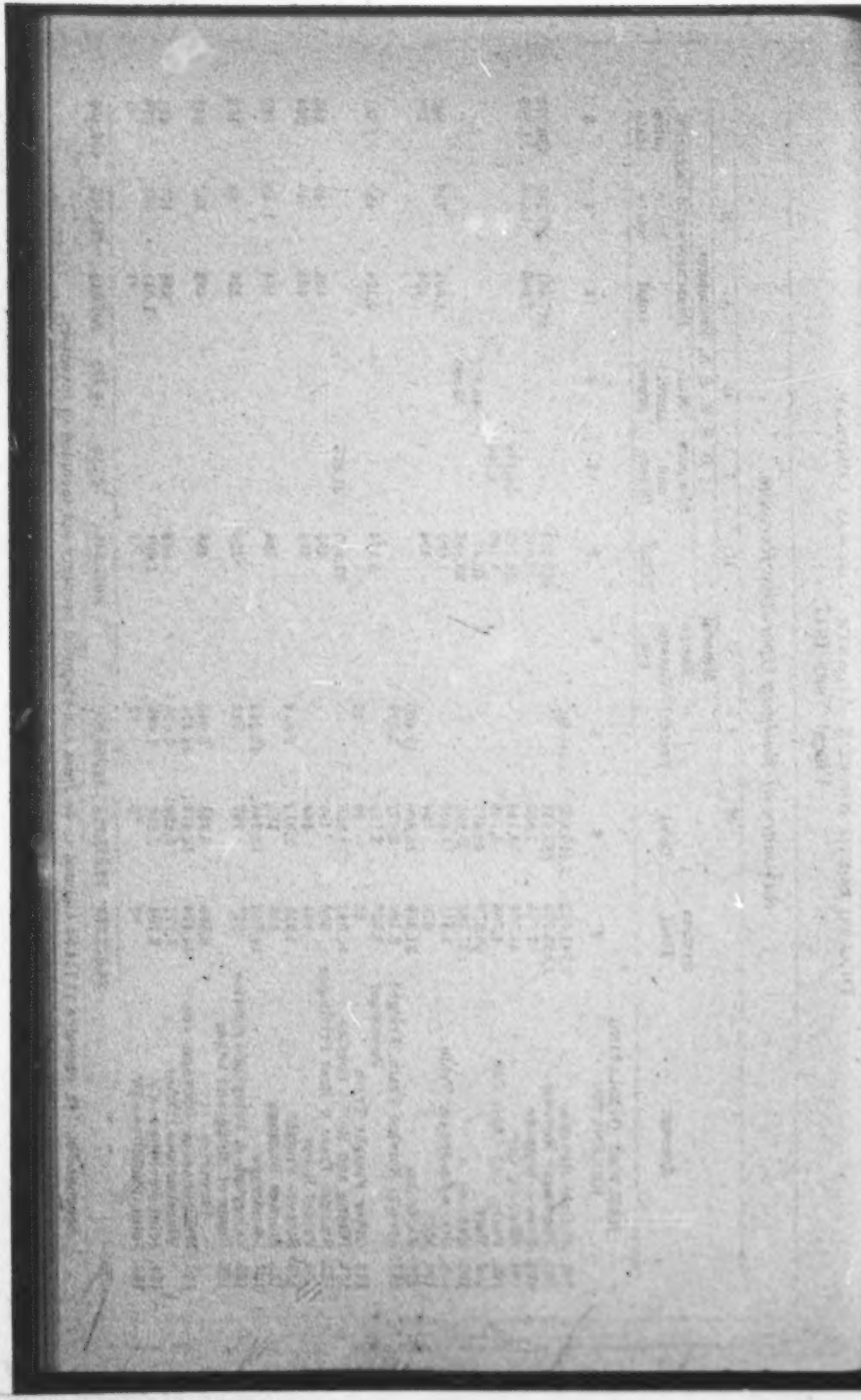
DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Summary of Railway Operative Revenue.

Account	System Total	M Total	I Freight	C Mineral Range Passenger	H D. S. S. & A. Passenger. Total	I Sleepers and Diners	G Mail and Express	A Passengers and Baggage. Total	N Passengers and Baggage. Inter-state	Intra-state
RAILWAY OPERATING REVENUES:	$	$	$	$	$	$	$	$	$	$
101. Freight Revenue	2,741,033	2,415,802	2,415,802							
102. Passenger Revenue	1,033,125	887,421			887,421			887,421	267,349	620,072
103. Excess Baggage	7,793	7,095			7,095			7,095	1,886	5,209
104. Sleeping Car	44,107	34,148			34,148	34,148				
105. Parlor and Chair Car	4,706	4,706			4,706	4,706				
106. Mail	50,579	40,477			40,477		40,477			
107. Express	37,368	33,995			33,995		33,995			
108. Other Passenger Train	1,811	1,601			1,601			1,601	716	885
109. Milk	678	194			194			194		194
110. Switching	21,230	12,400	12,400							
111. Special Service Train, Freight Passenger	3,180 2,523	3,077 2,174	3,077		2,174			2,174	493	1,681
112. Other Freight Train	43	40	40							
131. Dining and Buffet Service	40,043	31,865			31,865	31,865				
133. Station, Train & Boat Privileges	600	495			495			495	149	346
134. Parcel Room	464	464			464			464	140	324
135. Storage Freight	2,925	2,813	2,813							
136. Storage Baggage	165	164			164			164	49	115
137. Demurrage	14,743	12,344	12,344							
138. Telegraph & Telephone Service	817	767	541		226			226	68	158
142. Rents of Bldgs. and Other Property	6,595	6,528	6,040		488			488	147	341
143. Miscellaneous Dockage, etc.	44,474	44,474	44,474							
Miscellaneous, Other	5,771	5,624	5,036		588			588	177	411
151. Joint Facilities—Cr.	3,704	2,516	1,485		1,031			1,031	361	670
152. Joint Facilities—Dr.	*3	*3	*2		*1			*1		*1
	$4,073,579	$3,552,181	$2,505,050		1,047,181	70,719	74,472	901,940	271,535	630,405

Account No. 142, excludes $1,114.50 claimed to be from non-operated property not included in inventory.

THIS PAGE BOUND VERTICAL IN BOOK



INCOME ACCOUNTS

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

The presentation of the following computations of income is not intended to waive the claim that the passenger earnings of the Mackinaw Transportation Company are to be added to the net corporate income of the passenger business, particularly if sleeping car and dining car operations are to be included.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Hire of Equipment.

	System	Michigan	Michigan Freight	Michigan Passenger	Passengers and Baggage	Sleepers and Diners
RENT RECEIVED FOR HIRE OF EQUIPMENT:						
Locomotives leased to Soo Bridge Switching Account (a)	$ 7,495.00	$ 6,364.00	$ 5,350.85	$1,013.15		
Locomotives leased to Others, Passenger (c)	1,012.16	339.79		339.79		
Freight	4,008.20	3,360.88	3,360.88			
Work (b)	613.00	443.00	353.03	89.97		
Various	1,159.83	1,133.39	1,100.91	32.48		
	14,288.19	12,141.06	10,165.67	1,975.39		
Passenger Train Cars	306.02	250.75		250.75		
Work Equipment (b)	1,507.43	1,235.19	984.32	250.87		
TOTAL	16,101.64	13,627.00	11,149.99	2,477.01	2,477.01	
		Interstate 30.13%			746.53	
		Intrastate 69.87%			1,730.69	
RENT PAID FOR HIRE OF EQUIPMENT:						
For Freight Cars	100,845.82	82,633.06	82,633.06			
For Locomotives, Passenger	16.73	11.25		11.25	11.25	
For Locomotives, Freight	6,020.37	4,933.09	4,933.09			
For Passenger Cars	499.29	409.12		409.12	409.12	
For Sleepers	1,520.61	1,245.99		1,245.99		1,245.99
	$108,899.82	$89,232.51	$87,566.15	$1,666.36	$ 420.37	$1,245.99
		Interstate 30.13%			126.66	
		Intrastate 69.87%			293.71	

Same as Delf except as follows:
(a) On basis of use by DSS&A.
(b) On basis Repair Work Equipment, Passenger 20.31%; Freight 79.69%
(c) On basis of use of individual locomotives by DSS&A.

THIS PAGE BOUND

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Joint Facilities—Rent Received.
Michigan.

	Michigan Total	Michigan Freight	Michigan Passenger	Common
Main Line—Michigamme to Beaufort Jct. C. & N. W. Frts.	$ 1,200.27			$1,200.27
Main Line—Ishpeming to Marquette C. & N. W. Passenger	1,047.14		1,047.14	
Main Line—Negaunee to Calumet C. & N. W. Passenger	6,523.94		6,523.94	
Main Line—Champion to Calumet C. M. & St. P. Passenger	4,106.25		4,106.25	
Main Line—Houghton to Pilgrim Mineral Range Frts.	3,252.16			3,252.16
Mine Yard Tracks—Ishpeming	1,208.82	1,208.82		
Land Negaunee Depot site	150.00		150.00	
Union Depot Tracks	57.00			57.00
Enginehouse—Houghton	268.40	265.40		
Yard Tracks Marquette, M. M. & S. R.	160.00	160.00		
	$17,979.04	$1,627.22	$11,827.33	$4,509.43
Common to Frt. 70.46%; Pass. 29.54%		3,177.34	1,332.09	
	$17,979.04	$4,814.62	$13,164.43	
22/121 of C&NW Calumet Run to Min. Range	967.12		967.12	
14/78 of CM&STP. Calumet Run to Min. Range	737.02		737.02	
	$16,284.90	$4,814.62	$11,470.28	
Passenger to Intra. 69.87%			8,014.28	
Inter. 30.13%			3,456.00	

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Taxes.

Income—Dr.

System Total on basis of accruals as in previous years		$191,233.17	
Deduct Internal Revenue Taxes, Sleeping Car	$61.77		
Chair Car	25.63		
		87.40	
		191,345.77	
Michigan Accrual 91.10% of last above		174,224.89	
Add Internal Revenue Taxes Sleeping Car	47.82		
Chair Car	25.63		
		73.45	
			174,298.34
Michigan assigned to services relatively to Operating Expenses	$2,532,790	% 100.00	$174,224.89
Freight	1,864,124	73.60	128,229.53
Mineral Range Pass.	18,954	.75	1,306.69
Passenger DSS&A Pass.	649,702	25.65	44,688.68
D. S. S. & A. Passenger to Services	649,702	100.00	44,688.68
Sleeper and Diner	233,323	25.90	16,043.24
Mail and Express	77,743	11.96	5,344.77
Passengers and Baggage	335,736	52.14	23,300.67
Passenger and Baggage to Service	536,736	100.00	23,300.67
Interstate	103,241	32.13	7,486.51
Intrastate	229,895	67.87	15,814.16
Michigan Passenger Business			44,688.68
Michigan Sleeping Car and Chair Car Tax			73.45
Total			44,762.13
Sleeper and Diner Revenue Taxes			73.45
Sleeper and Diner assigned above			16,043.24
Total			16,116.71

The above assignment is on the basis of the accruals as in past years and is here assigned for temporary use.

It is subject to revision in common with previous years.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.
Fiscal Year 1917.

Income Account.

	System	M	I	C	H	I	G	A	N	
					D. S. S. & A. Passenger Service					
	Total	Total	Freight	Mineral Range	Total	Sleepers and Diners	Mail and Express	Passengers and Baggage. Total	Passengers and Baggage. Inter-state	Passengers and Baggage. Intra-state
	$	$	$	$	$	$	$	$	$	$
Railway Operating Revenue	4,073,579	2,552,181	2,505,050		1,047,121	70,719	74,472	901,940	271,535	630,406
Railway Operating Expenses	3,051,235	2,532,790	1,864,134	18,954	649,702	233,223	77,743	338,736	108,841	229,895
	1,022,344	1,019,391	640,916	*18,954	397,429	*162,504	*3,271	563,204	162,694	400,510
ADDITIONS:										
Rents received from Hire of Equipment (a)	16,102	13,627	11,150		2,477			2,477	746	1,731
Joint Facility—Cr. (b)	18,346	17,979	4,815	1,694	11,470			11,470	3,456	8,014
Interest—Cr. (exclusive of Interest from Pass. Fund)	7,102	5,219	4,100		1,719			1,719	518	1,201
	1,063,794	1,056,216	660,981	*17,260	413,095	*162,504	*3,271	578,870	167,414	411,456
DEDUCTIONS:										
Rents paid for Hire of Equipment (a)	196,900	89,233	87,566		1,666	1,246		420	126	294
Joint Facility—Dr.	41,328	11,785	10,090		1,695			1,695	780	876
Miscellaneous Rents	175	166	166							
Interest—Dr.	16	13	8		4			4	1	3
Taxes (c)	101,333	174,298	128,219	1,306	44,763	16,117	5,245	23,301	7,487	15,814
	341,753	275,466	226,049	1,306	48,098	17,363	5,245	25,390	8,403	16,987
Net Corporate Income	722,041	781,250	434,912	*18,566	364,997	*179,867	*8,516	553,480	159,011	394,469

(a) Details on third preceding page.
(b) Details on second preceding page.
(c) Details on first preceding.

*Typewritten in red.

INDEX

1914

Factors 1- 24
Primary Expense Accounts—Details 25- 57
Primary Expense Accounts—Summary 58- 67
Revenues 68
Income 69

1915

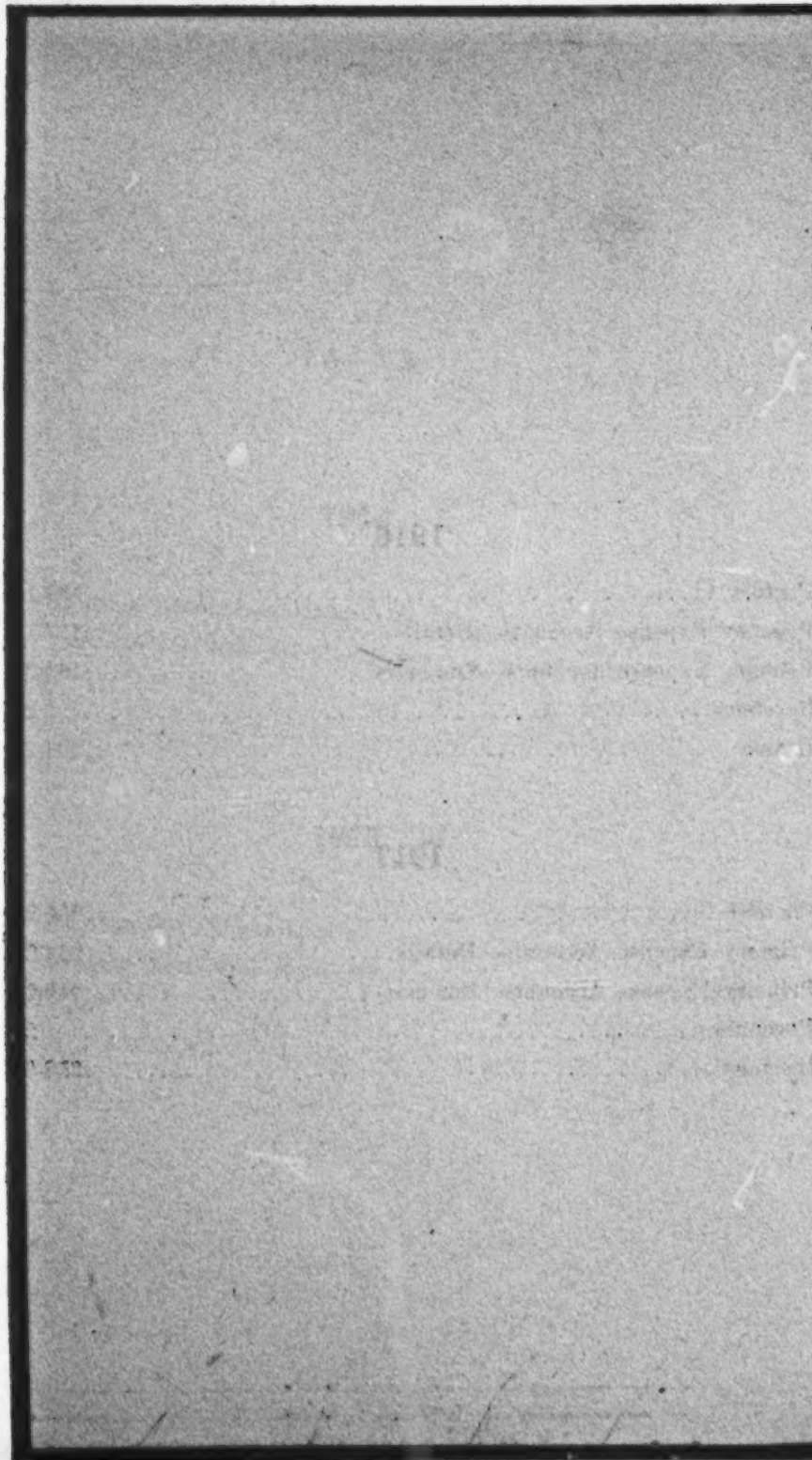
Factors 71- 89
Primary Expense Accounts—Details 91-124
Primary Expense Accounts—Summary 125-134
Revenues 135
Income 136-137

1916

Factors 139-156
Primary Expense Accounts—Details 157-192
Primary Expense Accounts—Summary 193-202
Revenues 203
Income 204-205

1917

Factors 207-224
Primary Expense Accounts—Details 225-248
Primary Expense Accounts—Summary 249-256
Revenues 257
Income 258-259



1914

Duluth, South Shore & Atlantic Railway.

FACTORS

USED FOR ASSIGNMENT

OF

OPERATING EXPENSES AND EARNINGS

TO

MICHIGAN

PASSENGER

SERVICES

INTRA

Factor 1

1914

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Percentages of Maintenance of Way and Structures Accounts. Less Depreciation of Docks, $19,145.88.

			Michigan	
A. Accounts 2-14	$541.012.40		81.7428%	1
	661,846.79			
B. Accounts 2-14 & 17	556,230.18		81.1532%	2
	677,064.95			
C. Accounts 2-17	599,372.90		81.0813%	3
	739,224.20			
D. Accounts 2-17 & 19	602,106.47		81.0531%	4
	742,854.20			
	Michigan	Passenger		
E. Accounts 2-14 & 17	151,525.95		27.2380%	5
	556,230.18			
F. Accounts 2-14	150,641.18		27.8443%	6
	541,012.40			
G. Accounts 2-17	162,819.37		27.1648%	7
	599,372.90			
H. Accounts 2-14 & 17	70,633.04	Passenger & Baggage	46.6145%	
	39,743.71	Sleepers	26.2290%	
	20,397.08	Diners	13.4611%	
	20,752.11	Mail & Express	13.6954%	8
	151,525.94			
J. Accounts 2-17	76,237.13	Passenger & Baggage	46.8231%	
	42,490.83	Sleepers	26.0969%	
	21,797.21	Diners	13.3074%	
	22,294.20	Mail & Express	13.6926%	9
	162,819.37			

Factor 2

1914

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Percentages of Maintenance of Equipment Accounts.

		Michigan		
A. Accounts 25-45	$343,236.77	84.0587%		1
	408,329.71			

B. Accounts 25-45 plus Sleeper and Diners repairs.

	System	Michigan		
Sleepers	5,454.97	4,150.59	.9938%	
Diners	3,850.21	3,226.31	.7725%	
Acct. 25-45	408,329.71	343,236.77	82.1859%	
	417,634.89	350,613.67	83.9522%	2

C. Accounts 25, 31, 34, 43 plus Sleepers and Diners.

	System	Michigan		
Accts. 25 etc.	307,404.55	258,256.05	81.5434%	
Sleepers	5,454.97	4,150.59	1.3105%	
Diners	3,850.21	3,226.31	1.0187%	
	316,709.73	265,632.95	83.8726%	3

D. Accounts 25, 31, 34, 43 plus Sleepers and Diners.

	Michigan	Passenger		
Acct. 25 etc.	258,256.05	72,440.06	27.2707%*	
Sleepers	4,150.59	4,150.59	1.5625%	
Diners	3,226.31	3,226.31	1.2146%	
	265,632.95	79,816.96	30.0478%	4

*Includes Mineral Range Run, $3,018.31—4.1666% of Passenger.

E. Accounts 25-45, plus Sleepers and Diners.

	Michigan	Passenger		
Accts. 25-45	343,236.77	85,567.85	24.4052%	
Sleepers	4,150.59	4,150.59	1.1838%	
Diners	3,226.31	3,226.31	.9202%	
	350,613.67	92,944.75	26.5092%	5

F. Accounts 25, 31, 34, 43 plus Sleepers and Diners and less M.R.R.R.

Passenger & Baggage	41,530.54	54.1477%	
Sleepers	13,780.46	17.9670%	
Diners	8,200.86	10.6923%	
Mail & Express	13,186.79	17.1930%	6

1914

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Assignment of Thomaston Engine House Replacement.
Based on 1916 test.

1. Engines in and out of Thomaston Roundhouse.

Passenger	741	29.4749%	
Freight	1773	70.5251%	
$30,000.00 X	29.4749%	$8,842.47	Passenger.
30,000.00 X	70.5251%	21,157.53	Freight.

2. Schedule mileage of trains using Thomaston Roundhouse.
Passenger per day, 264 miles, Michigan 147 miles, 55.68%
Freight per week, 3100 miles, Michigan 1683 miles, 54.29%

3

$8,842.47 Passenger	X	55.68%	$4,923.49
21,157.53 Freight	X	54.29%	11,486.42
	Total Michigan		$16,409.91

1914

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Factor for Assignment of Engine House Repairs.
(Beyond Thomaston Engine House Replacement.)

	—System—		—Michigan—	
Account 72				
Eng. Hse. Exps-Yard	14,310.71	21.6427%	14,310.71	
Account 81				
Eng. Hse. Exps-Road	51,806.97		42,916.89	44.8955%

$2,667.73 X 21.6427% is Yard proportion $577.36

1916 test shows engines handled at all round houses as follows:—
Total 12783 engines, Passenger 5739, or 44.8955%

Located to Michigan	$2,244.43
Wisconsin	270.01
Overheads	153.29

Pro-rate overheads gives Michigan $2,382.74 of which $577.36 is Switch.

Factor 5

1914

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

A—Fuel Accounts in Transportation Expenses.
B—Water Accounts in Transportation Expenses.

		System	Michigan	
A.	Account 73	$ 22,744.53	22,744.53	7.8135%
	Account 82	323,794.12	268,347.75	92.1865%
		346,538.65	291,092.28	
			84%	
B.	Account 74	1,520.40	1,520.40	8.9025%
	Account 83	18,772.68	15,557.92	91.0975%
		20,293.08	17,078.32	
			84.158%	
		Michigan	Passenger	
C.	Account 74	1,520.40	48.35	
	Account 83	15,557.92	5,334.57	
		17,078.32	5,382.92	31.5190%
D.	Account 73	22,744.53	723.28	
	Account 82	268,347.75	92,011.55	
		291,092.28	92,734.83	31.8575%

1914 Factor 6

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Engine Miles—Road.

	—System—			—Michigan—		
	Total	Freight	Passg'r	Total	Freight	Passg'r
Frt. Mdse.	989,082	989,082		803,438	803,438	
Frt. Ore	48,091	48,091		48,091	48,091	
Passg'r	963,708		963,708	802,737		802,737
Mixed	18,871	15,537	3,334	18,871	15,537	3,334
Special	1,681	615	1,066	1,359	526	833
Road Swi	156,601	154,353	2,248	129,126	126,878	2,248
M. R. R. R.	42,701		42,701	42,701		42,701
	2,220,735	1,207,678	1,013,057	1,846,323	994,470	851,701

6—A. All Road Loco. Miles to Michigan

1,846,323 83.1402% 1

2,220,735

6—B. All Pass. Rd. Loco. Miles in Michigan

851,853 46.1378% 2

1,846,323

6—C. All Freight Loco. Miles to Michigan

994,470 82.3456% 3

1,207,678

6—D. All Pass. Loco. Miles to Michigan

851,853 84.0874% 4

1,013,057

6—G. Special Loco. Miles to Michigan

1,359 80.8447% 7

1,681

6—H. Pass. Rd. and Road Switch

847,686 84.0411% Mich.

1,008,657

6—I. Frt., Incldg. Road Switch

977,407 82.0292% Mich.

1,191,536

6—K. Pass., Incldg. Road Switch

804,985 83.3356% Mich.

965,956

Factor 6 *Continued*

1914

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Engine Miles—Road.

6—E. Pass. Train Miles — Loco's—to Mich.
802,737 83.2967% 5
963,708

6—F. Frt. Rd. & Rd. Miles to Michigan
978,407 82.1138% 6
1,191,526

6—L. Special Train Miles
833 61.2951% Pass.
1,359

1—17.67% Passenger based on car miles 1915 and 1916 combined.

2—Special trains, Passenger 934
Special trains, Mixed, 747 132 Frt. 615
1,066

3—Special trains, Passenger 721
Special trains, Mixed, 638 112 Frt. 526
833

4—Including 35,748 miles light locomotives—Freight.
Including 13,846 miles light locomotives—Passenger.

Factor 7

1914

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Passenger Car Miles.
Does Not Include D. S. S. & A. Ry. Sleepers.

	—System—		—Michigan—		
	Passenger Coaches	Other Pass. Cars	Passenger Coaches	Other Pass. Cars	
D. S. S. & A. Coaches	1,914,270		1,599,971		1
Mail, Express, Bagg., Etc.		880,388		720,484	2
Foreign Diners		89,504		89,504	3
D. S. S. & A. Ry. Diners		351,284		294,361	4
C.&N.-W. and C.,M.&St.P. cars in D.S.S.&A.Ry. trains	213,592	152,738	213,592	152,738	5
	2,127,852	1,473,914	1,813,563	1,257,087	6
D.S.S.&A.Ry. cars on Mineral Range R. R.	77,324	73,904	77,324	73,904	7
	2,205,186	1,546,818	1,890,887	1,330,991	8
Foreign Sleepers, Parlor & Obvs. cars		245,061		243,487	9
D.S.S.&A.Ry. Sleepers		689,956		524,976	10
Pass. cars on C.&N.-W. and C.,M.&St.P. trains	63,584	31,887	63,584	31,887	11
Do Sleepers		4,380		4,380	11
	2,268,770	2,518,102	1,954,471	2,135,721	12
Mineral Range cars paid for Deduct	14,991		14,991		13

7—A. Cars on which D.S.S.&A.Ry. made repairs.

Lines 1, 2, 7 & 13	136,237	Mineral Range	4.648307%
	2,320,455		79.172232%
	2,930,875		

(Diners and Sleepers are in outside operations.)

7—B. Car miles taken account of by Car Accountant (which will agree with Company's miles, although latter is incomplete—See above.)

Lines 6, 9 and 10	3,839,113	84.6217%
	4,536,793	

7—C. Car miles, Passenger, less Mineral Range and freight car miles.

	F 3,937,864	20.1952%
	F 15,561,158	(from Factor 8)

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Freight Car Miles.

	System	—Michigan—		
Loaded cars	13,148,376	DSS&ARy	4,872,272	
" "		Foreign	6,297,216	
Empty cars	5,281,608	DSS&ARy	2,333,059	
" "		Foreign	2,053,816	
Special loaded cars	6,648	DSS&ARy	1,988	
" " "		Foreign	2,807	
	18,436,632		15,561,158	
Caboose cars	930,881		769,568	
Special caboose cars	605		496	
	19,368,118		16,331,222	84.3201%
		Less caboose	770,064	
			15,561,158	

1914 Factor 9

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

All Accounts Block IV, Transportation, Except 61, 77, 78, 94, 98, 104 and 105.

A.	Michigan	$1,057,119.12	85.6781%
	System	1,233,826.63	
B.	Michigan	$ 300,377.65	28.4147% to Passenger
		1,057,119.12	
	Mineral Range Passenger included in "B."	$12,970.05	4.3179%
C.	Passenger and Baggage	$156,459.62	55.6894%
	Sleepers	59,718.97	21.2560%
	Diners	30,091.24	10.7105%
	Mail and Express	34,680.32	12.3441%

Less Mineral Range and on accounts 62, 63, 66 to 76, 80 to 85, 87, 89, 90, 91, 93, 100 and 102.

Factor 10

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Car Accountant's Office.

	System		$4,740.00
Estimated	Passenger	15%	811.00
	Freight	85%	3,929.00

To Michigan car miles, $ 811.00 Factor 7-B $ 686.28
To Michigan car miles, 3,929.00 Factor 8 3,312.94

Factor 11

1914

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Train Mileage.

	—System—			—Michigan—			
	Total	Freight	Passenger	Total	Freight	P'sng'r	
Road	1,882,961	948,600	934,361	1,557,972	782,236	775,736	1
Mixed	17,616	14,503	3,113	17,616	14,503	3,113	2
Special	782		782	677		677	3
Spl. Mixed	659	543	116	550	453	97	4
	1,902,018	963,646	938,372	1,576,815	797,192	779,623	5
Road Swi.	156,601	154,353	2,248	129,126	126,878	2,248	6
	2,058,619	1,117,999	940,620	1,705,941	924,070	781,871	7
M. R. RR.	49,030		49,030	49,030		49,030	8
*Deduct	*6,329	Paid for	*6,329	*6,329		*6,239	9
	2,101,320	1,117,999	983,321	1,748,642	924,070	824,572	10
CM&StPRy own trns	20,032		20,032	20,032		20,032	11
C&NWRy. own trns	10,950		10,950	10,950		10,950	12
	2,132,302	1,117,999	1,014,303	1,779,624	924,070	855,554	13
Lt. Locos #	59,762	42,257	17,705	49,594	35,748	13,846	14

11—A. All frt. trn. miles into Michigan.

924,070 82.65392%

1,117,999

Estimated on % of 1916.

11—E. Miles, less M. R. RR. plus switch from factor 15.

F. 1,160,247

P. 834,464 41,8338%

1914

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Train Mileage.

11—B. All Pass. trn. miles in Michigan.
Line 10 824,572 83,85584%

983,321

11—C. Trn. miles Mich. including Road Swi and light locos—excluding Mineral Range R. R.
F. 959,818
P. 826,699 46.2743%

11—D. Trn. miles Switch & Road & Lt. Locos made on main track Michigan, (factor 15 incl. and M. R. RR. excluded).
F. 1,008,706
P. 830,228 45.1472%

#Engines running light not included above. Estimated on per cent of 1916.

11—F. Miles less Rd. Switch and M.R.RR—plus lt. locos and plus switching yard.
F. 1,069,117
P. 842,216 44.0643%

11—G. Train miles on Common track.
F. 1,028,032
P. 831,228 44.7075%

1914 Factor 12

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY

All Accounts Up to General Expenses.

A.		System	Michigan
I.	Maintenance of Way and Structures	$ 795,084.15	$ 646,615.43
II.	Maintenance of Equipment	431,057.80	361,814.75
III.	Traffic Expenses	105,707.22	88,067.59
IV.	Transportation Expenses	1,294,557.99	1,089,023.69
		$2,626,407.16	$2,185,521.46
			83.2134%

B.	Michigan	Michigan	Passenger
I.	Maintenance of Way and Structures	$ 646,615.43	$ 168,158.76
II.	Maintenance of Equipment	361,814.75	91,118.34
III.	Traffic Expenses	88,067.59	46,213.54
IV.	Transportation Expenses	1,089,023.69	312,135.72
		$2,185,521.46	$ 617,626.36
			28.2599%

To Passenger Services, After Deducting Expenses to Mineral Range Run.

	Passenger	Passenger & Baggage	Sleeper	Diners	Mail & Express
I.	168,158.76	78,845.43	43,813.09	22,469.18	23,031.06
II.	87,120.85	51,818.83	12,384.46	6,473.23	16,444.33
III.	46,213.54	46,213.54			
IV.	298,985.12	165,665.01	64,011.62	32,299.70	37,008.79
	600,478.27	342,542.81	120,209.17	61,242.11	76,484.18
		57.0450%	20.0189%	10.1989%	12.7372%

Factor 13

1914

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Gross Weights—Trains.

	—Freight—		—Passenger—	
A.	All Tracks	Common Tracks	All Tracks	Common Tracks
Cars	259,003,993	259,003,993	172,730,543	172,730,543
Locomotives	90,747,956	90,747,956	83,960,512	83,960,512
Loading	221,440,826	221,440,826	8,106,050	8,106,050
Total Train Wts.	571,192,775	571,192,775	264,797,105	264,797,105
Train Switching	22,862,255	13,017,768	353,560	353,560
Yard Switching	51,727,216	23,529,307	1,007,131	457,741
	645,782,246	607,739,850	266,157,796	265,608,406
Ton Miles Co.'s Freight (Est.)	8,837,256	8,837,256		
Total Gross Wts.	654,619,502	616,577,106	266,157,796	265,608.406
				30.1080%
Above includes Co. frt. and wts. of cars carrying same	15,004,682	15,004,682		
Percent ignoring Company freight				30.6290%

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Mileage of Track Chargeable to Services and Percentage of Same on Basis of Two Miles Side Track Equals One Mile Main Track.

	Miles	Adjusted 2 to 1	
Common, Freight and Passenger			
Main track	408.78	408.78	
Second track	6.55	6.55	
Sidings	40.90	20.45	
	456.23	435.78	82.9078%
Exclusive Freight			
Main track	12.47	12.47	
Ore spurs	22.21	11.11	
Industrial spurs	21.35	10.67	
Sidings	109.07	54.54	
	165.10	88.79	16.8925%
Exclusive Passenger			
Sidings	2.10	1.05	.1997%
	623.43	525.62	100.0000%

19

Factor 15

1914

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Statement of Switching Miles—Michigan.

			On Common		On Common
Yards		Total	Track	Total	Track
Freight	96.82%	236,177	103,522		
Passenger	3.18%			7,765	3,529
Train					
Freight		126,878	72,244		
Passenger				2,248	2,248

Factor 16

1914

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Combining Factors 13, 14 and 15 for Division of Track Accounts in Michigan.

A	Percentage	Passenger Percentage
Freight (Factor 14)	16.8925	
Passenger (Factor 14)	.1997	.1997
Common, Freight and Passenger	82.9078	
Common, on Gross Weights, (Factor 13)	30.1080	24.9649
Total Passenger Percentage		25.1646

B	Percentage	Passenger
Freight (Factor 14)	16.8925	
Passenger (Factor 14)	.1997	.1997
Common, Freight and Passenger	82.9078	
Common on train miles on Common track, Factor 11-g	44.7075 ton miles	37.0660
		37.2657%

Factor 17

1914

Duluth South Shore & Atlantic Railway Company.

Details of weights ton miles of Passenger cars and contents to various passenger services.

		Passengers & Baggage	Mail & Express	Sleepers	Diners	
Pass. Cars			749,733			1
Other Pass. Trains			21,638,747			2
Sleepers, Parlor & Obs.-For.				17,439,701		3
Dining Cars—Foreign					6,008,404	4
Sleepers—D.S.S.&A.Ry.				30,092,353		7
Obs. Diners—D.S.S.&A.Ry.					11,303,596	6
Diners—D.S.S.&A.Ry.					7,087,558	7
Trn. Loading			2,412,698			8
			24,801,178	47,532,054	24,399,558	9
Total	180,836,593		13,7147%	26.2845%	13.4926%	10
Pass. Train Switching	353,860		58,927			11
	181,190,153		24,860 105	47,532,054	24,399,558	
			13.7204%	26.1239%	13.4663%	12
Pass. Yard Switching	457,741		17,303	194,643	99,913	13
	181,647,894		24 877,408	47.726,697	24,499,471	14
		46.5430%	13.6954%	26.2743%	13.4873%	15

The direct Passenger percent, .1997, is too small to affect the total result. Ignored.

B. Tonnages handled by D.S.S.&A.Ry. Engines.

Pass. Cars.	63,335,560		749,733			16
Other Pass. Cars	34,476,477		21,615,693			17
Sleeper, Parlor and Obs., For'n	17,119,961			17,119,961		18
Dining Cars—Foreign	6,008,404				6,008,404	19
Sleepers—D.S.S.&A.Ry.	30,092,353			30,092,353		20
Obs. and Diners—D.S.S.&A.Ry.	11,303,596				11,303,596	21
Diners	7,087,558				7,087,558	22
	169,425,909		22,365,426	47,212,314	24,399,558	23
Trn. Loading	7,796,230		2,102,878			
	177,222,139		24,468,304	47,212,314	24.399.558	24
		45.7854%	13.8066%	26.6402%	13.7678%	25
Pass. Train Switch	353,560		58,927			
	177,575,699		24,527,231	47,212,314	24,399,558	27
		45.8602%	13.8123%	26.5871%	13.7404%	28

Duluth South Shore & Atlantic Railway Company.

Details of car miles on passenger trains to various passenger services.

	Total	Passenger & Baggage	Mail & Express	Sleepers	Diners	
Pass. cars	1,812,857	1,782,351	30,506			1
Pass. cars, spl.	706	706				2
Other Pass. Trn. cars	872,508	327,889	544,619			3
Other Pass. Trn. spl.	714	714				4
D8S&A Obs. & Diners	179,879				179,879	5
D8S&A Diners	114,482				114,482	6
Frn. Diners	89,504				89,504	7
For'n Sleepers Prlr. & Obs.	243,487			243,487		8
D8S&A Slprs. & Prlr. cars	524,976			524,976		9
	3,839,113	2,111,660	575,125	768,463	383,865	10
Percentage		55.0039%	14.9806%	20.0167%	9.9988%	11
Marquette Run C., M. & St. P. and C. & N.-W Rys.	99,851	94,318	1,153	4,380		12
	3,938,964	2,205,978	576,278	772,843	383,865	13
Percentage		56.0040%	14.6302%	19.6205%	9.7453%	14
D.S.S.&A. cars on Mineral Range	77,324	77,324				15
D.S.S.&A. other Pass. cars on M. R. R. R.	73,904	27,773 (est.)	46,131			16
	4,090,192	2,311,075	622,409	772,843	383,865	17
Percentage		56.5029%	15.2171%	18.8950%	9.3850%	18
Switching St. Ignace	2,034	1,098	263	454	219	
Percentage		53.9823%	12.9302%	22.3206%	10.7669%	
Lines 1 to 4	575,125					
	2,686,785	Mail and Express, 21.4057%				

Duluth South Shore & Atlantic Railway Company

Factors for Assignment of Passenger and Baggage. Expenses to Inter and Intra.

Factors INTRA 1 to 5

Factor 1. Time for Coupon ticket sales by actual test was that it took 5.75 times as much time to sell a coupon ticket than a simplex ticket. That the Mineral Range coupon tickets did not participate in the above time ratio, being sold in the same time as simplex tickets.

The ticket sales were as follows:

	INTRA, No.	INTER, No.		INTRA, No.	Adjusted
Simplex	420,275	11,326	A-1	420,275	11,326
M. R. Coupons	51,761		A-1	51,761	
Coupons	12,777		A-5.75	73,458	
Coupons		14,859	A-5.75		85,324
Mileage	14,144	343	A-5	81,155	2,972
				626,659	99,622

Intra Proportion 86.2833%

Factor 2. Intra-State passenger mile proportion.

Intra	24,554,687	64.6725%
Inter	13,400,992	

Factor 3. Overhead per cent for Maintaining Way and Structure Exp.

Intra	$48,120.53	64.9039%
Inter	26,020.82	

Factor 4. By Investigation conducted in part by Mr. Heiss, and therefore called the "Heise Ratio," the intra percentage of the following accts. was determined. Set up by the Railway and accepted by us:

A. Outside Agencies	7.97%
B. Advertising	30.94%

Factor 5. Overhead percent for Traffic expenses.

Inter	$26,677.09	
Intra	7,679.12	22.4027%

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Factors for Assignment of Passenger and Baggage Expenses to Inter and Intra.

Factors INTRA 6-7

Factor 6. Overhead percent for Transportation expenses.

Intra	$108,773.07	=	67.1739%
Inter	53,154.50		

Factor 7. Overhead percent for General Expenses.

Inter	$135,395.95		
Intra	204,751.02	=	60.1949%

1914

Duluth, South Shore & Atlantic Railway

DISTRIBUTION OF

OPERATING EXPENSES

BY PRIMARY ACCOUNTS

A. System.

Michigan Passenger.
Michigan Passenger Services.

Followed by Tabulations of these Accounts.

B. Assignment of Passenger and Baggage Expenses to INTER and INTRA.

C. Distribution of Income Accounts up to Return on Investment.

The basic figures so used in the following computations and divisions of Expenses are used as taken from the books and records of the company, without adjustment for the purpose of reducing them to those necessary for a normal year of operation, and are subject to adjustments to be made to eliminate expenditures to make good deferred maintenance, and those for additions and betterments.

It is the claim of defendants that the expenses in the maintenance of way group of these years were excessive in at least the amount of—

1914	$202,000
1915	20,000
1916	17,000
1917	90,000

The presentation of the following computations of income is not intended to waive the claim that the passenger earnings of the M. T. Co. are to be added to the net corporate income of the passenger business, particularly if sleeping car and dining car operations are to be included.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Details of Distribution of Operating Expenses by Primary Accounts for the Year Ending June 30th, 1914.

Account		System	Michigan	Passenger
1	Superintendence, Maintenance of Way and Structures.			
		$23,253.50		
	(Factor 1-D)		$18,830.71	
	(Factor 1-G)			$5,115.32
	Assignment of Passenger to Service.			
	Passenger and Baggage,	Factor 1-J	$2,395.15	
	Sleepers,	Factor 1-J	1,334.94	
	Diners	Factor 1-J	684.81	
	Mail and Express	Factor 1-J	700.42	

Account		System	Michigan	Passenger
2	Ballast	$20,376.40		
	Located by Mutual Audit Co.		$20,197.65	
	Factor 16			$5,082.66
	Assignment of Passenger to Service.			
	Passenger and Baggage,	Factor 17, Line 15,	$2,365.63	
	Sleepers,	Factor 17, Line 15,	1,335.43	
	Diners,	Factor 17, Line 15,	685.51	
	Mail and Express,	Factor 17, Line 15,	696.09	

Account		System	Michigan	Passenger
3	Ties	$117,363.50		
	Located to Michigan,		$91,619.93	
	Factor 16,			$23,055.79
	Assignment of Passenger to Services.			
	Passenger and Baggage,	Factor 17, Line 15,	$10,730.86	
	Sleepers,	Factor 17, Line 15,	6,057.75	
	Diners,	Factor 17, Line 15,	3,109.60	
	Mail and Express,	Factor 17, Line 15,	3,157.58	

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Details of Distribution of Operating Expenses (Continued).

Account		System	Michigan	Passenger
4	Rails	$50,034.38		
	Located to Michigan		$48,268.38	
	Factor 16,			$12,146.54
	Assignment of Passenger to Services.			
	Passenger and Baggage,	Factor 17, Line 15,	$5,653.36	
	Sleepers,	Factor 17, Line 15,	3,191.42	
	Diners,	Factor 17, Line 15,	1,638.24	
	Mail and Express,	Factor 17, Line 15,	1,663.52	

Account		System	Michigan	Passenger
5	Other Track Material,	$30,509.23		
	Located to Michigan,		$27,132.35	
	Factor 16,			$6,827.75
	Assignment of Passenger to Services.			
	Passenger and Baggage,	Factor 17, Line 15,	$3,177.84	
	Sleepers,	Factor 17, Line 15,	1,793.94	
	Diners,	Factor 17, Line 15,	920.88	
	Mail and Express,	Factor 17, Line 15,	935.09	

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account

6 ROADWAY AND TRACK. Divided to conform with 1915 and 1916 classification—Accounts 202 and 220.

	System				Michigan
6-A Roadway Maintenance					
1. Care of Roadbed	$ 7,953.25	Located by	M.A.Co.		$ 6,557.81
2. General Cleaning	17,905.23	"	"	"	14,472.73
3. Watching Roadway	25,902.05	"	"	"	22,012.10
4. Track Changes	81.30	"	"	"	58.10
5. Train Service	5,363.54	"	"	"	4,912.00
6. Bank Protection	290.60	"	"	"	288.70
7. Other Expenses	35.00	"	"	"	35.00
Total Roadway Maintenance					48,336.44
6-B Track Laying and Surfacing					
1. Applying Ballast	$12,796.60	Located by	M.A.Co.		$12,639.45
2. " Ties	66,915.60	"	"	"	53,414.31
3. " Rails	20,749.68	"	"	"	19,557.49
4. " Other Tk. Mat.	4,516.47	"	"	"	4,047.14
5. Track Maintenance	159,000.49	"	"	"	131,258.49
6. Track Changes	29.15	"	"	"	29.15
7. Train Service	10,549.77	"	"	"	7,070.17
Total Track Laying and Surfacing					228,016.20
Grand Total					$276,352.64

	Michigan		Passenger
6-A.	$ 48,336.44	Factor 11-C	$22,367.35
6-B.	228,016.20	Factor 16	57,379.36

Assignment of Passenger to Services.

6-A. Passenger and Baggage	Factor	17,	Line 15,	$10,410.44
Sleepers	"	17,	" 15,	5,876.86
Diners	"	17,	" 15,	3,016.75
Mail and Express	"	17,	" 15,	3,063.30
6-B. Passenger and Baggage	Factor	17,	Line 15,	$26,705.08
Sleepers	"	17,	" 15,	15,076.03
Diners	"	17,	" 15,	7,738.92
Mail and Express	"	17,	" 15,	7,858.33

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account		System	Michigan
7	REMOVAL SNOW, SAND & ICE	$20,070.50	
	Located to Michigan by M.A.Co.		$18,450.14
	On basis of tracks used exclusively, and cost of work, we have deduced percentages of cost for each class of service, which are liberal, though general.		
		Michigan	Passenger
	Passenger 1%	$ 184.50	$ 184.50
	Freight 29%	6,350.54	
	Common 70%	12,915.10	
	" divided on Factor 11—D		5,409.88
			5,594.38

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 12,	$ 2,611.43
Sleepers	" 17, " 12,	1,462.03
Diners	" 17, " 12,	753.36
Mail & Express	" 17, " 12,	767.56

Account		System	Michigan
9	BRIDGES TRESTLES & CULVERTS	$76,702.46	
	Located by M.A.Co.		$45,886.28
	Freight direct, 1916 test, 4.2959%	$ 1,971.23	
	Balance Common	43,915.05	Passenger
	Common divided—Factor 13		$13,221.94

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 15,	$ 6,153.89
Sleepers	" 17, " 15,	3,473.97
Diners	" 17, " 15,	1,783.28
Mail & Express	" 17, " 15,	1,810.80

Account		System	Michigan
10	OVER & UNDERGRADE CROSSINGS	$ 73.82	
	Located to Michigan (all freight)		$ 73.82

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account
11 GRADE CROSSING FENCES, CATTLE GUARDS & SIGNS

	System	Michigan	Passenger
	$ 9,795.06		
Located by M.A.Co.		$ 8,758.47	
Factor 11-E			$ 3,664.00

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17,	Line 15,	$ 1,705.35
Sleepers	" 17,	" 15,	962.69
Diners	" 17,	" 15,	494.16
Mail & Express	" 17,	" 15,	501.80

Account
12 SNOW AND SAND FENCES & SNOW SHEDS

	System	Michigan	Passenger
	$ 1,050.91		
Located by M.A.Co.		$ 1,021.42	
Factor 11-E			$ 427.30

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17,	Line 15,	$ 198.88
Sleepers	" 17,	" 15,	112.27
Diners	" 17,	" 15,	57.63
Mail & Express	" 17,	" 15,	58.52

Account
13 SIGNALS & INTERLOCKERS

	System	Michigan	Passenger
	$ 441.62		
Located by M.A.Co.		$ 179.76	
$179.76 divided on percentage determined by week's test in July, 1915, and July, 1916, time and number of trains using facilities. 5.24%			$ 9.42

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17,	Line 10,	$4.39
Sleepers	" 17,	" 10,	2.47
Diners	" 17,	" 10,	1.27
Mail & Express	" 17,	" 10,	1.29

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account					
14	TELEGRAPH AND TELEPHONE LINES	System	Michigan	Passenger	
		$ 3,339.86			
	Located by M.A.Co.		$ 3,071.56		
		Michigan			
	1/3 Trains	$1,023.85	Factor 11-F.	$	451.15
	2/3 Station	2,047.71	Factor 7-C.		413.54
					$864.69

Assignment of Passenger to Services.

$451.15	Passenger & Baggage	Factor 17,	Line 10,	$209.82
	Sleepers	" 17,	" 10,	118.58
	Diners	" 17,	" 10,	60.87
	Mail & Express	" 17,	" 10,	61.88
$413.54	Passenger & Baggage	Factor 18,	Line 11,	$227.46
	Sleepers	" 18,	" 11,	82.78
	Diners	" 18,	" 11,	41.35
	Mail & Express	" 18,	" 11,	61.95

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account		System		Michigan
16	BUILDINGS, FIXTURES & GROUNDS. Sub-divided according to use.			
16-A	Shops & Storehouses	$ 1,691.43	Accts. 25-45 Factor 2-A	$ 1,421.79
B	Rd. Houses and Turntables			
1	Thomaston Renewal	30,000.00	Engs in & out, Factor 3	
	Freight		" 3	11,486.42
	Passenger		" 3	4,923.49
2	Other Rd. Houses	2,667.73	" 4	2,382.94
C	Stations & Grounds	8,146.49	Located by M.A.Co.	6,708.80
D	Sec. Houses & Others	4,327.14	" " "	3,008.78
E	Coal Sheds & Trestles	5,562.74	Accts. 73 & 82, Factor 5	4,672.70
F	Water Tanks & Pumps	6,706.82	" 73 " 82, " 5	5,633.56
G	Track Scales	2,503.71	Located by M.A.Co.	2,350.47
H	Fixtures	553.67	" " "	553.67

	Assignment to Passenger.	Passenger
$1,421.79	Shops, Factor 2-E	$ 376.90
	Thomaston Round House, Factor 3	4,923.49
2,382.94	Road Engs. $1,805.58, Switch $577.36.	
1,805.58	Road Engines, Factor 4	810.62
577.36	Switch Engs. on Switch % of 3.18	18.36
6,708.80	Station Bldgs. acct. 63—13.8747%	933.51
3,008.78	Section Bldgs., Factor 1-E	819.53
4,672.70	Coal Sheds & Trestles, Factor 5-D	1,488.61
5,633.60	Water Tanks & Pumps, Factor 5-C	1,775.64
553.67	Fixtures, Factor 2-E	146.76

Assignment of Passenger to Services.

		Passenger & Baggage	Sleepers	Diners	Mail and Express
$ 376.90	Shops, 14-F	$ 204.08	$ 67.72	$ 40.30	$ 64.80
146.76	Fxtrs. 14-F	79.47	26.87	15.69	25.23
933.51	Acct. 63	790.44	49.72		93.35
819.53	Factor 1-E	382.02	214.95	110.32	112.24
128.14	Eng. Swi.-18-14	71.76	25.14	12.49	18.75
5,624.33	" Rd. 17-28	2,579.32	1,495.35	772.81	776.85
1,488.61	Fuel 17-28	682.68	395.78	204.54	205.61
1,775.64	Water, 17-28	814.31	472.09	243.98	245.26

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Accounts		System	Michigan	Passenger
17	DOCKS & WHARVES	$34,363.76		
	Located to Michigan, M.A.Co.			
	Marquette docks, all freight		$ 7,430.76	
	St. Ignace Mdse. dock "		3,847.79	
	St. Ignace Slip dock, Joint		3,939.33	
	Marquette dock, Depreciation, all freight		19,145.88	
	Cars over St. Ignace Slip dock, Freight		50,782	
	" " " Passg'r		7,354X2 14,708=22.46%	
	St. Ignace Slip Dock, $3,939.33X22.46%			$ 884.77

Assignment to Passenger Services.

Passenger & Baggage	Factor 2, Line 22,	$	477.62
Sleepers	" 2, " 22,		197.49
Diners	" 2, " 22,		95.26
Mail & Express	" 2, " 22,		114.40

Account		System	Michigan	Passenger
18	ROADWAY TOOLS & SUPPLIES	$ 9,525.57		
	To Mich., on accts. 2-17, (Factor 1-C) 81.0813%		$ 7,723.45	
	Factor 1-G			$ 2,098.06

Assignment of Passenger to Services.

Passenger & Baggage	Factor 1-J,	$	982.38
Sleepers	" 1-J,		547.53
Diners	" 1-J,		280.87
Mail & Express	" 1-J,		287.28

Account		System	Michigan	Passenger
19	INJURIES TO PERSONS	$ 3,630.08		
	Located to Mich. M.A.Co.		$ 2,733.57	
	Direct to Passenger			$ 2.35
	Common $2,731.22 Factor 1-G			741.93

Assignment of Passenger to Services.

Passenger & Baggage	Factor 1-J,	$	348.50
Sleepers	" 1-J,		194.23
Diners	" 1-J,		99.64
Mail & Express	" 1-J,		101.91

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account
20 STATIONERY & PRINTING

	System	Michigan	Passenger
	$ 852.76		
Assigned to Michigan		$ 696.70	
Factor 1-G			$ 189.26

Assignment of Passenger to Services.

Passenger & Baggage	Factor 1-J,	$ 88.62
Sleepers	" 1-J,	49.39
Diners	" 1-J,	25.34
Mail & Express	" 1-J,	25.91

Account
21 OTHER MAINTENANCE OF WAY EXPENSES

	System	Michigan	Passenger
	$ 167.98		
Assigned to Michigan		$ 136.50	
Factor 1-G			$ 37.08

Assignment of Passenger to Services.

Passenger & Baggage	Factor 1-J,	$ 17.36
Sleepers	" 1-J,	9.68
Diners	" 1-J,	4.96
Mail & Express	" 1-J,	5.08

Account
22 MAINTAINING JOINT TRACKS, YARDS & OTHER FACILITIES. DR.

		System	Michigan	Passenger
		$ 9,462.36		
Located to Michigan M.A.Co.			$ 8,137.53	
Located to Passenger direct				$ 827.25
Freight	$7,274.54			
Common Station Exps.	4.18 on Acct. 63			.58
" Crossings	31.56 Factor 11-E			13.20

Assignment of Passenger to Services.

$827.83	Passenger & Baggage	Factor 18, Line 11,	$455.35
	Sleepers	" 18, " 11,	165.70
	Diners	" 18, " 11,	82.77
	Mail & Express	" 18, " 11,	124.01
$ 13.20	Passenger & Baggage	Account 63,	$ 11.18
	Sleepers	" 63,	.70
	Mail & Express	" 63,	1.32

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account 23 MAINTAINING JOINT TRACKS, YARDS & OTHER FACILITIES.

	System	Michigan	Cr. Passenger
	*$10,156.30		
Located to Michigan by M.A.Co.		*$10,156.30	
Located tracks—Passenger			*$ 2,576.38
Located to tracks	$3,923.94	Factor 16	987.44
" " Bridges	251.25	" 13	75.64
" " Stations	56.25	" Acct. 63	7.77
" " Soo Rd. Hs.	36.71	" 74%	27.17
" " Coal & Water	19.64	" Coal Accts.	6.26
" " Overheads	18.36	" 1-G	4.98
98% being tracks we use track percent.			$3,685.64

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 28,	$ 1,690.24
Sleepers	" 17, " 28,	979.01
Diners	" 17, " 28,	506.42
Mail & Express	" 17, " 28,	509.07

*All figures Credit Items—Deduct.

Account 24 SUPERINTENDENCE—MAINTENANCE OF EQUIPMENT

	System $12,661.58	Passenger	Mineral Range
Assigned to Mich. Factor 2-C	$10,619.59		$120.66
Assigned to Passenger, Factor 2-D (Regular)		$3,190.95	M. R. included 124.01

Assignment of Passenger to Services.

Mineral Range Run		$ 124.01
Passenger & Baggage	Factor 2-F,	1,660.68
Sleepers	" 2-F,	551.04
Diners	" 2-F,	327.92
Mail & Express	" 2-F,	527.30

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account 25 STEAM LOCOMOTIVES—REPAIRS

	System	Michigan		
	$113,758.45			
By agreement to Mich.		$95,639.67		
By agreement, Passenger		34,722.46	includes M.R.R.R.	$1,172.77
Freight		52,862.00		
Switch		8,055.21		

Passenger percent of switch is 3.18 based on time tests.

		Passenger
Switch $8,055.21 X 3.18%		$ 256.16
Passenger direct		34,722.46

Assignment of Passenger to Servires.

$ 256.16	Passenger & Baggage	44.19%	$ 113.20
	Sleepers	33.71%	86.34
	Diners	17.30%	44.32
	Mail & Express	4.80%	12.30
$34,722.46	Mineral Range Run		$ 1,172.77
	Passenger & Baggage	Factor 17, Line 28,	15,383.96
	Sleepers	" 17, " 28,	8,919.89
	Diners	" 17, " 28,	4,609.86
	Mail & Express	" 17, " 28,	4,633.98

Details of Distribution of Operating Expenses (Continued).

Account

26 STEAM LOCOMOTIVES—RENEWALS

System Michigan

*$201.16

By agreement to Mich. *$151.37

By agreement, Passenger *10.32 excludes M.R.R.R. *$0.52

Freight *241.65

Switch 100.60

Passenger percent of switch is 3.18 based on time tests.

Switch $100.60 X 3.12% $ 3.20

Passenger *10.32

Assignment of Passenger to Services.

*$10.32 Mineral Range Run *$ .52

Passenger & Baggage Factor 17, Line 18, *4.73

Sleepers " 17, " 18, *2.74

Diners " 17, " 18, *1.42

Mail & Express " 17, " 18, *1.43

$3.20 Passenger & Baggage 44.19% 1.41

Sleepers 33.71% 1.07

Diners 17.30% .57

Mail & Express 4.80% .15

(on cars—Parker 13-B)

Account

27 STEAM LOCOMOTIVES—DEPRECIATION

System Michigan

$24,560.37

Assigned to classes of service by individual locomotives and mileages assigned to Michigan on mileage of each class.

Agreed $20,783.64

Classes show—Freight 11,633.02

Passenger 6,242.74 includes M.R.R.R. $420.53

Switch 2,907.88

Switch 3.18% Passenger $ 92.67

Passenger 6,242.74

Assignment of Passenger to Services.

$ 92.67 Passenger & Baggage 44.19% $ 40.95

Sleepers 33.71% 31.16

Diners 17.30% 16.11

Mail & Express 4.80 4.45

See account 25

$6,242.74 Mineral Range Run 420.53

Passenger & Baggage Factor 17, Line 28, 2,670.08

Sleepers " 17, " 28, 1,547.96

Diners " 17, " 28, 799.99

Mail & Express " 17, " 28, 804.18

Details of Distribution of Operating Expenses (Continued).

Account
31 PASSENGER TRAIN CARS—REPAIRS

System	Michigan
$41,854.89	

Assigned to Mich., Factor 7-A $35,082.99 includes M.R.R.R. $1,945.54

Assignment of Passenger to Services.

Mineral Range Run	$ 1,945.54
Passenger & Baggage, car miles	24,922.68
Mail & Express	8,214.77
	$35,082.99

N. B.—Repairs to Sleepers and Repairs to Diners not included in Operating Expenses in 1914. Used in division of overhead are as follows:

	System	Michigan
Sleepers	$ 5,454.97	$ 4,150.59
Diners	3,850.21	3,226.31

Included in Expenses "Outside Operations."

Account
33 PASSENGER TRAIN CARS—DEPRECIATION

System
$ 7,199.20

Assigned to Mich., Factor 7-A $ 6,034.41 includes M.R.R.R. $ 334.64
Assigned to Mich., Factor 7-A $35.082.99 includes M.R.R.R. $1,945.54

Assignment of Passenger to Services made on basis of Account 31.

Mineral Range Run	$ 334.64
Passenger & Baggage	4,286.80
Mail & Express	1,412.97

Accounts
34 FREIGHT TRAIN CARS—REPAIRS
35 FREIGHT TRAIN CARS—RENEWALS
36 FREIGHT TRAIN CARS—DEPRECIATION

	System	Michigan
Repairs	$141,007.59	$118,671.99
Renewals	698.17	587.58
Depreciation	65,204.73	54,876.30

D. S. S. & A. Ry. figures accepted, as we are not concerned in freight, and since there is no particular peculiarity in freight car miles as there is in Passenger car miles, D. S. S. & A. uses the car mile basis to distribute the repairs.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Accounts
43 WORK EQUIPMENT—REPAIRS
45 WORK EQUIPMENT—DEPRECIATION

	System	Michigan	
Acct. 43	$10,783.62		
" 45	3,468.85		
Assigned to Michigan, Factor 1-B,		$ 8,859.09	
" " " " 1-B,		2,849.77	
To Passenger, Factor 1-E,			$ 2,378.45
" " " 1-E,			765.09

Assignment of Passenger to Services.

	Acct. 43	Acct. 45
Passenger & Baggage Factor 1-H,	$1,108.70	$ 356.65
Sleepers " 1-H,	623.84	200.66
Diners " 1-H,	320.17	102.99
Mail & Express " 1-H,	325.74	104.79

Account
46 SHOP MACHINERY & TOOLS

	System	Michigan	Passenger
	$ 7,070.18		
Assigned to Mich., Factor 2-C		$ 5,930.28	
To Passenger, Factor 2-D			$ 1,781.92

Assignment of Passenger to Services.

Passenger & Baggage Factor 2-F,	$ 964.86
Sleepers " 2-F,	320.16
Diners " 2-F,	190.53
Mail & Express " 2-F,	306.37

Account
48 INJURIES TO PERSONS

	System	Michigan	Passenger
	$ 965.83		
Located to Mich. by M.A.Co		$ 880.83	
To Passenger, Factor 2-D			$ 265.67

Assignment of Passenger to Services.

Passenger & Baggage Factor 2-F,	$ 143.85
Sleepers " 2-F,	47.73
Diners " 2-F,	28.41
Mail & Express " 2-F,	45.68

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account
49 STATIONERY & PRINTING

	System	Michigan	Passenger
	$ 1,302.60		
Assigned to Michigan		$ 1,093.54	
To Passenger, Factor 2-E			$ 289.88

Assignment of Passenger to Services.

Passenger & Baggage	Factor 2-F,	$ 156.96
Sleepers	" 2-F,	52.09
Diners	" 2-F,	30.99
Mail & Express	" 2-F,	49.84

Account
50 OTHER EXPENSES (MAINTENANCE OF EQUIPMENT)

	System	Michigan	Passenger
	$ 25.00		
Assigned to Mich., overhead, Factor 2-C		$ 20.98	
To Passenger, Factor 2-D			$ 6.30

Assignment of Passenger to Services.

Passenger & Baggage	Factor 2-F,	$ 3.42
Sleepers	" 2-F,	1.13
Diners	" 2-F,	.67
Mail & Express	" 2-F,	1.08

Account
51 MAINTAINING JOINT EQUIPMENT AT TERMINALS. DR.

	System	Michigan	Passenger
	$ 802.50		
Located to Michigan by M.A.Co.		$ 35.45	
Basis of charge accrual			$ 15.77

Assignment of Passenger to Services.

Passenger & Baggage	Factor 1-H,	$ 7.36
Sleepers	" 1-H,	4.13
Diners	" 1-H,	2.12
Mail & Express	" 1-H,	2.16

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Accounts 53 to 60 TRAFFIC EXPENSES	System	Michigan
53 Superintendence	$31,900.94	$26,441.60
54-A Outside Agencies—Freight	16,749.54	13,856.89
54-B Outside Agencies—Passenger	27,867.78	23,152.55
55 Advertising	5,045.65	4,191.71
56 Traffic Associations	296.64	245.41
57 Fast-Freight Lines	660.48	546.41
58 Industrial & Immigration Bureaus	11,056.07	9,583.02
59 Stationery & Printing	12,130.12	10,050.00
Total Michigan		88,067.59

D. S. S. & A. Ry. figures (corrected by agreement) accepted with no obligation as to subsequent treatment.
Above figures are based on Train Miles each class of Service into Michigan. Figures as follows accepted, as above noted.

	Michigan Passenger
53	$11,857.33
54	23,152.55
55	4,185.36
56 and 57	.....
58 To Passenger on Gross Revenue in Mich.	3,516.84
59	3,501.46

All assigned to Passenger & Baggage.

Details of Distribution of Operating Expenses (Continued).

Account 61 SUPERINTENDENCE—CONDUCTING TRANSPORTATION

	System	Michigan	Passenger
	$21,998.33		
Less Car Accountant	4,740.00		
Other Superintendence	17,258.33		
$17,258.33 to Mich. overhead, Factor 9-A		$14,786.61	
4,740.00 Car Acc't, Factor 10, Freight		3,312.94	
" " " 10, Passenger		686.28	
		18,785.83	
$14,786.61 to Passenger, Factor 9-B			$ 4,202.16
Car Accountant			686.28
			4,888.44

Assignment of Passenger to Services.

Mineral Range Run		$ 181.45
Passenger & Baggage	Factor 9-C	2,621.29
Sleepers	" 9-C,	1,000.52
Diners	" 9-C,	504.14
Mail & Express	" 9-C,	581.04

Account 62 DESPATCHING TRAINS

	System	Michigan	
Located	$ 3,197.20	$ 2,845.40	
Common	13,387.62		
Common to Mich. on ton miles, D.S.S.&A. figures taken		11,098.33	82.9%
		13,943.73	

Ton Mile factor including Switch and light engines gives total of $14,070.38. As we had agreed upon above Michigan assignment prior to our use of this factor of ton miles, and as difference was small it was allowed to remain as it was without prejudice as to subsequent treatment this year, or without establishing a precedent for subsequent years.

1/3 time despatching trains Common, Factor 11-F	44.0643%
Balance, 2/3 distributing cars, freight, of which we will take 1/3 as reciprocal time of Agents & Operators receiving orders.	
44.0643% less 13.814% already charged of these Sta. men	30.2496%
	74.3139%
Passenger 1/3 or percent of	24.7713%

Michigan $13,943.73 X 24.7713% $3,454.04

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 15,	$	1,607.62
Sleepers	" 17, " 15,		907.52
Diners	" 17, " 15,		465.86
Mail & Express	" 17, " 15,		473.04

Account
63 STATION EMPLOYEES

	System	Michigan		
	$166,606.25			
Located to Mich. by M.A.Co.		$147,375.03		
	Michigan	Freight	Passenger	Common	Located
Located	$147,375.03	$67,107.81	$10,756.74	$69,510.48	52.8343%
Common on located	13.8147%	9,602.67			
		20,359.41			

Assignment of Passenger to Services.

Passenger & Baggage	84.6732%	$17,238.96
Sleepers	5.3268%	1,084.51
Mail & Express	100.0000%	2,035.94

Sleepers based on number of tickets sold to D. S. S. & A. Sleepers with computation of time consumed in sales of each class of tickets. Mail and Express on Mr. Parker's computation of mail service.

Account
64 WEIGHING & CAR SERVICE ASSOCIATIONS

	System	Michigan	
	$1,793.22		
To Michigan on freight ton miles		$1,482.99	all freight
D. S. S. & A. Ry. figures taken.			

Account
65 COAL AND ORE DOCKS

	System	Michigan	
	$21,703.64		
All located to Michigan		$21,703.64	all freight

Account
66 STATION SUPPLIES & EXPENSES

	System	Michigan	Passenger
	$12,272.08		
Located to Michigan by M.A.Co.		$10,855.88	
Michigan to Passenger on acct. 63			$ 1,503.85
All assigned to Passenger & Baggage.			

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Acct. 72 $14,310.41

Accounts		All Michigan	Passenger percent (Parker) 3.18%
67 to 76	YARD ACCOUNTS		
67		$ 4,659.35	$ 148.17
68		47,654.77	1,515.42
69		4,052.27	128.88
70		1,311.69	41.71
71		27,327.96	869.03
#72	Engine House Exps.—Yard	14,310.21	407.74
73		22,744.53	723.28
74		1,520.40	48.35
75		279.76	8.90
76		424.92	13.51

#Acct. 72 $14,310.41
Less Soo Yd. 1,488.12 $12,822.29 X 3.18%=$407.74

Assignment of Passenger to Services.

Pasenger & Bagagge	44.19%	$1,725.62
Sleepers	33.71%	1,316.37
Diners	17.30%	675.56
Mail & Express	4.80%	187.44

(Parker's 13-B Cars Handled)

Account 77 OPERATING JOINT YARDS & TERMINALS. DR.

	System	Michigan	Passenger
	$42,671.09		
Located to Mich. by M.A.Co.		$18,594.91	
Michigan located to Passenger			$ 6,492.23

Assignment of Passenger to Services.

Passenger & Baggage direct		$ 2.36
Passenger & Baggage	Factor 17, Line 28,	2,976.27
Sleepers	" 17, " 28,	1,725.47
Diners	" 17, " 28,	891.73
Mail & Express	" 17, " 28,	896.40

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account					
78	OPERATING JOINT YARDS & TERMINALS. CR.				
	Credit account—Deduct		System	Michigan	Passenger
			$14,341.01		
	Located to Mich. by M.A.Co.			$14,341.01	
	Mich. located	Freight	Common		
		$12,356.33	$ 3,201.78		
	Gen'l Expenses		11.28		
	$11.28 Factor 5-C				3.56
	3,201.78 on Soo Engine House Exp., 1916				1,981.50
					$1,985.06

Assignment of Passenger to Services.

$ 3.56	Passenger & Baggage	Factor	17,	Line 28,	$ 1.66
	Sleepers	"	17,	" 28,	.93
	Diners	"	17,	" 28,	.48
	Mail & Express	"	17,	" 28,	.49
$1,981.50	Passenger & Baggage	Factor	17,	Line 28,	910.38
	Sleepers	"	17,	" 28,	526.82
	Diners	"	17,	" 28,	272.27
	Mail & Express	"	17,	" 28,	273.69

Details of Distribution of Operating Expenses (Continued).

Account
80 ROAD ENGINEMEN

	System	Michigan	
Freight	$108,123.35		
Passenger	71,883.31		
To Michigan on Locomotive miles			
Freight Factor 6-C		$ 89,034.82	
Passenger Factor 6-D		60,444.80	includes M.R.R.R. $3,029.95
		149,478.62	

Assignment of Passenger to Services.

Mineral Range Run		$ 3,029.95
Passenger & Baggage	Factor 17, Line 28,	26,330.57
Sleepers	" 17, " 28,	15,264.94
Diners	" 17, " 28,	7,889.03
Mail & Express	" 17, " 28,	7,930.31

Account
81 ENGINE HOUSE EXPENSES—ROAD

	System	Michigan	Passenger
	$61,806.97		
Assigned to Michigan on Revenue Engine mile basis, Company's figures used, 82.84%		$42,916.89	
We use 41.7% as Passenger percentage of Michigan, as per agreement			$17,896.34

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 28,	$ 8,207.30
Sleepers	" 17, " 28,	4,758.12
Diners	" 17, " 28,	2,459.03
Mail & Express	" 17, " 28,	2,471.89

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account

82 FUEL FOR ROAD LOCOMOTIVES

	System		Michigan		
	$323,794.12				
Assigned to services by M. A. Co.					
Freight	212,560.16	Factor 6-F	$174,541.22		
Passenger	108,895.45	" 6-H	91,516.93	MRRR	$4,610.09
Mixed	2,083.19	100.00%	2,083.19		
Special	255.32	Factor 6-G	206.41		
Totals	323,794.12		268,347.75		

Assignment to Passenger, Direct	$91,516.93
Mixed $2,083.19, car miles Factor 17 Line 6 & 7	368.10
Special 206.41 Factor 6-1	126.52
Total Passenger	92,011.55

Assignment of Passenger to Services.

Passenger & Baggage,	Factor	17	Line	28	$42,082.49
Sleepers,	"	17	"	28	23,237.51
Diners,	"	17	"	28	12,009.31
Mail & Express	"	17	"	28	12,072.15

Details of Distribution of Operating Expenses (Continued).

Accounts

83 WATER FOR ROAD LOCOMOTIVES
84 LUBRICANTS FOR ROAD LOCOMOTIVES

	System	Michigan	
Account 83 Assigned to services and Michigan on basis of Account 82	$18,772.68		
Freight		$10,223.35	
Passenger		5,334.57	includes MRRR $267.33
		15,557.92	

	System		
Account 84 Assigned to services and Michigan on basis Account 82	$4,327.93		
Freight		$2,356.96	
Passenger		1,229.85	includes MRRR $61.63
		3,586.81	

Assignment of Passenger to Services.

				Account 83	Account 84
Passenger & Baggage,	Factor	17	Line 28	$2,323.85	$535.75
Sleepers	"	17	" 28	1,347.23	310.60
Diners	"	17	" 28	696.26	160.52
Mail & Express	"	17	" 28	699.90	161.35
Mineral Range Run				267.33	61.63

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account

85 OTHER SUPPLIES FOR ROAD LOCOMOTIVES

System $5,654.01

Assigned to services by special analysis of M. P. & M. Department issue of supplies to individual locomotives and individual locomotive mileage.

	System		Michigan	Passenger	
Freight	4,122.88	Factor 6-I	$3,381.93		
Passenger	1,419.78	" 6-K	1,183.18	$1,183.18	
Mixed	32.27	All	32.27	5.70	17.67%
Special	6.48	Factor 6-G	5.24	3.21	6-L
Mineral Range Passg'r	72.60		72.60	72.60	
			$4,675.22	$1,264.69	

Assignment of Passenger to Services.

Mineral Range Run		$ 72.60
Passenger & Baggage	Factor 17-28,	546.69
Sleepers	" 17, Line 28,	316.94
Diners	" 17, " 28,	163.80
Mail & Express	" 17, " 28,	164.66

Account

88 ROAD TRAINMEN

	System	Michigan
Freight	$144,342.43	
Passenger	69,695.71	

Assigned to Michigan on Train Miles

Freight Factor 11-A $119,304.68

Passenger " 11-B 58,443.92 including M.R.R.R. $3,026.56

Assignment of Passenger to Services.

From analysis of Pay-Rolls January and May, 1914, we find the following percentages of employees.

Conductors 53.11%. Brakemen 28.85%. Baggagemen 18.04%.

			Train Operation	Passenger and Baggage
Conductors	$29,436.16	50–50	$14,716.08	$14,716.08
Brakemen			15,987.91	
Baggagemen				9,997.29
			30,703.99	24,713.37

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account 88 (Continued)

Mineral Range Run		$ 3,026.56
Passenger & Baggage direct		24,713.37
Passenger & Baggage	Factor 18, Line 11,	16,888.39
Sleepers	" 18, " 11,	6,145.93
Diners	" 18, " 11,	3,070.03
Mail & Express	" 18, " 11,	4,599.64

Account

89 TRAIN SUPPLIES & EXPENSES

Located to Services by Company.

	System
Freight	$ 8,381.17
Passenger	32,282.78

To Michigan on Train Mile basis.

	System			
Freight	$ 8,381.17,	Factor 11-A	$ 6,927.36	
Passenger	32,282.78,	" 11-B	27,071.00	M.R.R.R. $1,401.89

Assignment of Passenger to Services.

Mineral Range Run		$ 1,401.89
Passenger & Baggage	Factor 18, Line 11,	14,119.01
Sleepers	" 18, " 11,	5,138.11
Diners	" 18, " 11,	2,566.60
Mail & Express	" 18, " 11,	3,845.39

Account

90 INTERLOCKER, BLOCK AND OTHER SIGNALS

	System	Michigan
	$1,277.47	
Located to Michigan (Negaunee Semaphore)		$23.97

On time computation in one week in July, 1915, and one week in January, 1916, despatchers' sheets of trains using crossing.

Passenger trains	5,481 minutes	5.24%
Freight trains	99,051 "	Parker's data

Passenger

$23.97 X 5.24% = $1.26

Assignment of Passenger to Services.

Passenger & Baggage	Factor 18, Line 11,	$0.70
Sleepers	" 18, " 11,	.25
Diners	" 18, " 11,	.12
Mail & Express	" 18, " 11,	.19

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account

91 CROSSING FLAGMEN AND GATEMEN

	System	Michigan	Passenger
	$ 8,361.80		
Located to Michigan by M.A.Co.		$ 7,921.80	
Michigan to Passenger, 5.24%			$ 415.10

The 5.24% determined by trains and time using the facilities (Parker's figures)

Assignment of Passenger to Services.

Passenger & Baggage	Factor 18,	Line 14,	$ 232.48
Sleepers	" 18,	" 14,	81.44
Diners	" 18,	" 14,	40.45
Mail & Express	" 18,	" 14,	60.73

Account

93 CLEARING WRECKS

	System	Michigan	Passenger
	$4,100.49		
Located to Michigan, Freight		$2,145.10 or 71.1287%	
Passenger		870.70 or 28.8713%	$870.70
Common		28.83 on located	8.32
			$879.02

Assignment of Passenger to Services.

Passenger & Baggage	Factor 18,	Line 14,	$ 492.29
Sleepers	" 18,	" 14,	172.47
Diners	" 18,	" 14,	85.66
Mail & Express	" 18,	" 14,	128.60

Account

94 TELEGRAPH & TELEPHONE OPERATIONS

	System	Michigan	Passenger
	$ 143.32		
Located to Michigan		$ 143.32	
Michigan to Passenger, Factor 17-B			$ 40.72

Assignment of Passenger to Services.

Passenger & Baggage,	Factor 9-C,		$ 22.67
Sleepers	" 9-C,		8.66
Diners	" 9-C,		4.36
Mail & Express	" 9-C,		5.03

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account 97 STATIONERY & PRINTING

	System	Michigan	Passenger
	$12,432.35		
Assigned to Michigan (overhead) Factor 9-A		$10,651.80	
Michigan to Passenger, Factor 9-B			$ 3,026.28

Assignment of Passenger to Services.

Passenger & Baggage	Factor 9-C	$1,685.32
Sleepers	" 9-C	643.26
Diners	" 9-C	324.13
Mail & Express	" 9-C	373.57

Account 98 OTHER EXPENSES—TRANSPORTATION

	System		Michigan	Passenger
	$1,066.74			
Assigned as follows	System			
Common	233.38	Factor 9-A	$190.96	
Freight	276.86	" 9-A	237.28	
Located to Michigan by MACo.				
Freight			408.05	
Passenger			66.98	
Common			6.00	
			918.27	
Michigan to Passenger, Located direct				$ 66.98
Common, $205.96, Factor 9-B				58.52
				125.50

Assignment of Passenger to Services.

Passenger & Baggage	Factor 9-C	$69.89
Sleepers	" 9-C	26.68
Diners	" 9-C	13.44
Mail & Express	" 9-C	15.49

Account 99 LOSS AND DAMAGE—FREIGHT

	System	Michigan
	$8,513.04	
Assigned to Michigan by Company on Train Mile basis. Company figures accepted by agreement and not binding as to method		$7,040.28

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account
100 LOSS AND DAMAGE—BAGGAGE

	System	Michigan
	$ 667.41	
Located to Michigan by M. A. Co.		$ 346.81

All Passenger and Baggage.

Account
101 DAMAGE TO PROPERTY.

	System	Michigan	Passenger
	$ 6,814.78		
Located to Michigan by M. A. Co.			
Passenger		$ 27.40	$ 27.40
Freight		3,055.90	
Common		1,727.00	
		$4,810.30	
Common, $1,727.00, divided on Factor 11-E			722.47
Total Passenger			$ 749.87

Assignment of Passenger to Services.

Passenger and Baggage	Factor 9-C,	$ 417.60
Sleepers	" 9-C,	159.39
Diners	" 9-C,	80.31
Mail and Express	" 9-C,	92.57

Account
102 DAMAGE TO LIVE STOCK ON RIGHT OF WAY.

	System	Michigan
	$ 1,001.78	
Located to Michigan, Passenger		$ 860.00
Freight		74.28
		$ 934.28

Assignment of Passenger to Services.

Passenger and Baggage	Factor 18, Line 14,	$ 481.63
Sleepers	" 18, " 14,	168.74
Diners	" 18, " 14,	83.81
Mail and Express	" 18, " 14,	125.82

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account
103 INJURIES TO PERSONS.

System	Michigan		Passenger	
$19,980.57				
Located to Michigan—				
Freight	$12,250.13	75.3096%		
Passenger	4,016.22	24.6904%	$ 4,016.22	M.R.R.R. $500.00
Common	773.40	on located	190.96	
Total Passenger			$ 4,207.18	

Assignment of Passenger to Services.

Mineral Range Run		$ 500.00
Passenger and Baggage	Factor 9-C,	2,064.50
Sleepers	" 9-C,	788.00
Diners	" 9-C,	397.05
Mail and Express	" 9-C,	457.62

Account
104 OPERATING JOINT TRACKS DR.

	System	Michigan		
	$ 2,540.68			
Located to Michigan		$ 714.20		
Michigan	Freight	Passenger	Common	
Station Supplies and Expenses			$ 64.50	
Gate Crossings			2.90	
Passenger—Soo Bridge		$ 95.54	all interstate	
Freight—Soo Bridge	$ 551.26			
Sta. Sup. & Exp. on Acct 63		8.91		
Gate Crossings on Acct 90		.15		
Total Passenger		$ 104.60		

So near, all allowed as Passenger and Baggage.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account				
105	OPERATING JOINT TRACKS.	CR.		
		System	Michigan	
		$ 4,081.18		
	Located to Michigan by M. A. Co.		$ 3,562.75	
	Michigan	Freight	Passenger	Common
	Station Supplies and Expenses	$ 84.24	$ 267.35	$ 326.93
	Station Service	2,036.30	540.91	120.00
	Water			202.24
	Common $446.93 divided on acct 63		$ 61.74	
	" 202.24 " " " Factor 5-C		63.74	
	Total Passenger		$ 933.74	

Assignment of Passenger to Services.

$870.00	Passenger and Baggage	Account 63,	$	736.66
	Sleepers	" 63,		46.34
	Mail and Express	" 63,		87.00
$ 63.74	Passenger and Baggage	Factor 17, Line 28,	$	29.23
	Sleepers	" 17, " 28,		16.95
	Diners	" 17, " 28,		8.76
	Mail and Express	" 17, " 28,		8.80

All figures are Credit—Deduct.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Accounts 106 to 116 GENERAL EXPENSES		System	Factors	Michigan	Passenger
106	Sal. Gen'l Officers	$24,949.38	12-A & B	$20,761.23	$5,867.10
107	Sal. G. Clerks, Etc.	38,681.02	12-A & B	32,187.79	9,096.24
108	Genl Ofs. Sup. & Exp.	3,741.19	12-A & B	3,113.17	879.78
109A	Exps. 2c Suit	32,092.09	Direct	32,092.09	
109B	Other Law Exps.	9,948.97	12-A & B	8,278.88	2,339.60
110	Insurance	10,591.84	Special	9,233.46	1,622.28
112	Pensions	720.00	12-A & B	599.14	169.32
113	Stat'y & Printing	5,032.60	12-A & B	4,187.80	1,183.47
113A	Valuation Exps.	8,207.87	Track Miles, all tracks used D.S.S.&A.Ry. 82.96%	6,809.25	1,924.29
114	Other Expenses	3,266.22	12-A & B	2,717.93	768.08
115	Genl Admn.Jt.Fac.	Dr. 555.34	Direct	150.65	91.94
116	" " " "	Cr. *197.00	Direct	*197.00	*55.71
	Total Passenger				23,886.39

Assignment of Passenger to Services.

Passenger and Baggage	Factor 12-C,	$13,625.99
Sleepers	" 12-C,	4,781.79
Diners	" 12-C,	2,436.15
Mail and Express	" 12-C,	3,042.46

*Credit Account—Deduct.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Exhibit .....
Page .....
Sheet .....

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger Assigned to Various Passenger Services.

Year Ending June 30th, 1914.

	A-System	B-Total Michigan	C-Michigan Passenger	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
I MAINTENANCE OF WAY AND STRUCTURES.								
1. Maintenance	23,232.52	15,830.71	5,115.22		2,395.15	1,334.94	684.81	700.42
2. Ballast	20,376.40	20,197.65	5,082.66		2,365.63	1,335.42	685.51	696.09
3. Ties	117,363.56	91,619.91	23,055.79		10,730.86	6,057.75	3,109.60	3,157.58
4. Rails	50,034.38	45,268.38	12,146.54		5,653.36	3,191.42	1,638.24	1,663.52
5. Other Track Material	30,509.23	27,132.35	6,827.75		3,177.84	1,793.94	920.88	935.09
6. Roadway and Track	332,088.93							
a—Care of Roadbed		6,557.81						
b—General Cleaning		14,472.73						
c—Watching Roadway		22,012.10						
d—Track Changes		58.10						
e—Train Service		4,912.00						
f—Bank Protection		288.70						
g—Other Expenses		35.00						
Total Roadway Maintenance		48,336.44	22,367.35		10,410.44	5,876.86	3,016.75	3,063.30
h—Applying Ballast		12,639.45						
i—Applying Ties		53,414.31						
k—Applying Rails		19,557.49						
l—Applying Other Track Material		4,047.14						
m—Track Maintenance		131,258.49						
n—Track Changes		29.15						
o—Train Service		7,070.17						
Total Track Laying & Surfacing		228,016.20	57,379.36		26,706.08	15,076.03	7,738.92	7,858.33

7.	Removal Snow, Sand & Ice	20,070.56	18,450.14	5,594.38	2,611.43	1,462.03	753.36	767.56
9.	Bridges, Trestles & Culverts	76,702.46	45,886.28	13,221.94	6,153.89	3,473.97	1,783.28	1,810.80
10.	Over and Under Grade Crossings	73.82	73.82					
11.	Grade Crossings, Ctl. Gds. and Signs	9,795.06	8,758.47	3,664.00	1,705.35	962.69	494.16	501.80
12.	Snow & Sand Fences & Snow Sheds	1,050.91	1,021.42	427.30	198.88	112.27	57.63	58.52
13.	Signals & Interlocking Plants	441.62	179.76	9.42	4.39	2.47	1.27	1.29
14.	Telegraph & Telephone Lines	3,339.86	3,071.56	864.69	437.28	201.36	102.22	123.83
16.	Buildings, Fixtures and Grounds	62,159.53						
	a—Shops and Storehouses		1,421.79	376.90	204.08	67.72	40.30	64.80
	b—Round Houses and Turn Tables		18,792.85	5,752.47	2,651.08	1,520.49	785.30	795.60
	c—Station Buildings and Grounds		6,708.80	933.51	790.44	49.72		93.35
	d—Section, Hand Car and Other Houses		3,008.78	819.53	382.02	214.95	110.32	112.34
	e—Coal Sheds and Trestles		4,672.70	1,488.61	682.68	395.78	204.54	205.61
	f—Water Tanks and Pump Houses		5,633.56	1,775.64	814.31	472.09	243.98	245.26
	g—Track Scales		2,350.47					
	h—Fixtures		553.67	146.76	79.47	26.37	15.69	25.23
17.	Docks and Wharves	34,363.76						
	a—St. Ignace Mdse. and Slip Docks		7,787.12	884.77	477.62	197.49	95.26	114.40
	b—Marquette Ore Dock		7,420.80					
	c—Marquette Merchandise Dock		9.96					
	d—Marquette Ore Dock—Depreciation		19,145.88					
18.	Roadway, Tools and Supplies	9,525.57	7,723.45	2,098.06	982.38	547.53	280.87	287.28
19.	Injuries to Persons	3,630.08	2,733.57	744.28	348.50	194.23	99.64	101.91
20.	Stationery and Printing	852.76	696.70	189.26	88.62	49.39	25.34	25.91
21.	Other Expenses	167.08	136.50	37.08	17.36	9.68	4.96	5.08

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Exhibit .....
Page .....
Sheet .....

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger Assigned to Various Passenger Services.

Year Ending June 30th, 1914.

		A-System	B-Total Michigan	C-Michigan Passenger	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
22. Maint. Jt. Tks., Yds. and O. Facil.	Dr.	9,462.36	8,137.53	841.03		466.53	166.40	82.77	125.33
23. Maint. Jt. Tks., Yds. and O. Facil.	Cr.	*10,156.30	*10,156.30	*3,685.64		*1,690.24	*979.81	*506.42	*503.07
Total, Maint. of Way and Structure *Deduct.		795,084.15	646,615.43	168,158.76		78,845.43	43,813.09	22,469.18	23,031.06
II. MAINTENANCE OF EQUIPMENT.									
24. Superintendence		12,661.58	10,619.59	3,190.95	124.01	1,660.68	551.04	327.92	527.30
25. Steam Locomotives—Repairs		113,758.45							
a—Freight			52,862.00						
b—Passenger			34,722.46	34,722.46	1,172.77	15,385.96	8,919.89	4,609.86	4,633.98
c—Switch			8,055.21	256.16		113.20	86.24	44.32	12.30
26. Steam Locomotives—Renewals		*206.16							
a—Freight			*241.65						
b—Passenger			* 10.32	*10.32		*4.73	*2.74	*1.42	*1.43
c—Switch			100.60	3.20		1.41	1.07	.57	.15

27.	Steam Locomotives—Depreciation	24,560.37							
	a—Freight		11,633.02						
	b—Passenger		6,242.74	6,242.74	420.53	2,670.08	1,547.96	799.99	804.13
	c—Switch		2,907.88	92.67		40.95	31.16	16.11	4.45
31.	Passenger Train Cars—Repairs	41,354.89	35,082.99	35,082.99	1,945.54	24,922.68			8,214.77
32.	" " " Renewals								
33.	" " " Depreciation	7,199.20	6,034.41	6,034.41	334.64	4,286.80			1,412.97
34.	Freight Train Cars—Repairs	141,007.59	118,671.99						
35.	" " " Renewals	698.17	587.58						
36.	" " " Depreciation	65,204.73	54,876.30						
43.	Work Equipment—Repairs	10,783.62	8,859.09	2,378.45		1,108.70	623.84	320.17	325.74
44.	" " Renewals								
45.	" " Depreciation	3,468.85	2,849.77	765.09		356.65	200.66	102.99	104.79
46.	Shop Machinery and Tools	7,070.58	5,930.28	1,781.92		964.86	320.16	190.53	306.37
48.	Injuries to Persons	965.83	880.83	265.67		143.85	47.73	28.41	45.68
49.	Stationery and Printing	1,302.60	1,093.54	289.88		156.96	52.09	30.99	49.84
50.	Other Expenses	25.00	20.98	6.30		3.42	1.13	.67	1.08
51.	Maint. Jt. Equip. at Terminals. Dr.	802.50	35.46	15.77		7.36	4.13	2.12	2.16
52.	Maint. Jt. Equip. at Terminals. Cr.								
	Total, Maintenance of Equipment	431,157.80	361,814.75	91,118.34	3,997.49	51,818.83	12,384.46	6,473.23	16,444.33

*Deduct.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Exhibit .....
Page .....
Sheet .....

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger Assigned to Various Passenger Services.

Year Ending June 30th, 1914.

	A-System	B-Total Michigan	C-Michigan Passenger	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
III. TRAFFIC EXPENSES.								
53. Superintendence	31,900.94	26,441.60	11,857.33		11,857.33			
54. Outside Agencies	44,617.32							
a—Freight		13,856.89						
b—Passenger		23,152.55	23,152.55		23,152.55			
55. Advertising	5,045.65	4,191.71	4,185.36		4,185.36			
56. Traffic Associations	296.64	245.41						
57. Fast Freight Lines	660.48	546.41						
58. Industrial and Immigration Bureaus	11,056.07	9,583.02	3,516.84		3,516.84			
59. Stationery and Printing	12,130.12	10,050.00	3,501.46		3,501.46			
60. Other Expenses								
Total Traffic Expenses	105,707.22	88,067.59	46,213.54		46,213.54			
IV. TRANSPORTATION EXPENSES.								
61. Superintendence	21,998.33	18,785.83	4,888.44	181.45	2,621.29	1,000.52	504.14	581.04
62. Dispatching Trains	16,584.82	13,943.73	3,454.04		1,607.62	907.52	465.86	473.04
63. Station Employees	166,606.25	147,375.03	20,359.41		17,238.96	1,084.51		2,035.94
64. Weighing & Car Service Associations	1,793.22	1,482.99						
65. Coal and Ore Docks	21,703.64	21,703.64						

66.	Station Supplies and Expenses	12,272.08	10,855.88	1,503.85		1,503.85			
67.	Yardmasters and their Clerks	4,659.35	4,659.35	148.17					
68.	Yard Conductors and Brakemen	47,654.77	47,654.77	1,515.42					
69.	Yard Switch and Signal Tenders	4,052.27	4,052.27	128.88					
70.	Yard Supplies and Expenses	1,311.69	1,311.69	41.71					
71.	Yard Enginemen	27,327.96	27,327.96	869.03					
72.	Enginehouse Expenses—Yard	14,310.21	14,310.21	407.74					
73.	Fuel for Yard Locomotives	22,744.53	22,744.53	723.28					
74.	Water for Yard Locomotives	1,520.40	1,520.40	48.35					
75.	Lubricants for Yard Locomotives	279.76	279.76	8.90					
76.	Other Supplies for Yard Locomotives	424.92	424.92	13.51					
	Total accounts 67 to 76 incl.			3,904.99		1,725.62	1,316.37	675.56	187.44
77.	Operating Jt. Yards & Terminals, Dr.	42,671.09	18,594.91	6,492.23		2,978.63	1,725.47	891.73	896.40
78.	Operating Jt. Yards & Terminals, Cr.	*14,341.01	*14,341.01	*1,985.06		*910.38	*527.75	*272.75	*274.18
80.	Road Enginemen	180,006.66							
	a—Freight Service		89,034.82						
	b—Passenger Service		60,444.80	60,444.80		26,330.57	15,264.94	7,889.03	7,930.31
81.	Enginehouse Expenses—Road	51,806.97	42,916.89	17,896.34		8,207.30	4,758.12	2,459.03	2,471.89
82.	Fuel for Road Locomotives	323,794.12							
	a—Freight Service		174,541.22						
	b—Passenger Service		91,516.93	91,516.93	4,610.09				
	c—Mixed Service		2,083.19	368.10					
	d—Special Service		206.41	126.52		40,082.49	23,237.51	12,009.31	12,072.15
83.	Water for Road Locomotives	18,772.68	15,557.92	5,334.57	267.33	2,323.85	1,347.23	696.26	699.90
84.	Lubricants for Road Locomotives	4,327.93	3,586.81	1,229.85	61.63	535.75	310.60	160.52	161.35
85.	Other Supplies for Road Locomotives	5,654.01	4,675.22	1,264.69	72.60	546.69	316.94	163.80	164.66

*Deduct.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Exhibit .....
Page .....
Sheet .....

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger Assigned to Various Passenger Services.

Year Ending June 30th, 1914.

		A-System	B-Total Michigan	C-Michigan Passenger	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
88.	Road Trainmen	214,038.14							
	a—Freight Service		119,304.68						
	b—Passenger Service		58,443.92	58,443.92	3,026.56	41,601.76	6,145.93	3,070.03	4,599.64
89.	Train Supplies and Expenses	40,663.95							
	a—Freight—Lubricating Cars								
	b—Freight—Miscellaneous		6,927.36						
	c—Cleaning & Lubricating Cars, Pass'gr								
	d—Passenger—Miscellaneous		27,071.00	27,071.00	1,401.89	14,119.01	5,128.11	2,566.60	3,845.39
90.	Interlockers, Block & O. S. Oper'n	1,277.47	23.97	1.26		.70	.25	.12	.19
91.	Crossing Flagmen & Gatemen	8,361.80	7,921.80	415.10		232.48	81.44	40.45	60.73
93.	Clearing Wrecks	4,100.49							
	a—Freight		2,165.61						
	b—Passenger		878.02	878.02		491.73	172.27	87.57	128.45
94.	Telegraph & Telephone Operation	143.32	143.32	40.72		22.67	8.66	4.26	5.03
97.	Stationery and Printing	12,432.35	10,651.80	3,026.28		1,685.32	642.26	334.13	373.57
98.	Other Expenses	1,066.74	918.27	125.50		68.89	26.68	13.44	15.49
99.	Loss and Damage—Freight	8,512.04	7,215.72						
100.	Loss and Damage—Baggage	667.41	346.21	346.21		346.21			
101.	Damage to Property	6,314.78	4,810.30	749.87		417.60	159.39	80.31	92.57
102.	Damage to Stock on Right of Way	1,001.78	934.28	860.00		481.63	168.74	83.81	125.82
103.	Injuries to Persons	19,980.57	17,039.71	4,207.18	500.00	2,064.50	788.00	397.06	457.62
104.	Operating Jt. Tracks & Facilities, Dr.	2,540.68	714.20	104.60		104.60			
105.	Operating Jt. Tracks & Facilities, Cr.	*4,981.18	*3,652.75	*933.74		*765.89	*63.29	*8.76	*85.80
	Total Transportation Expenses,	1,294,587.99	1,089,023.69	312,125.62	13,151.50	165,664.45	64,011.42	32,299.61	37,008.64

*Deduct.

V. GENERAL EXPENSES.								
106. Salaries & Expenses, General Officers	24,949.38	20,761.28	5,867.10					
107. Salaries & Expenses, Clerks & Attend'ts	38,681.02	32,187.79	9,096.24					
108. General Office Supplies and Expenses	3,741.19	3,113.17	879.78					
109. Law Expenses, Present Suit	32,092.09	32,092.09						
109-B Law Expenses, Others	9,948.97	8,278.88	2,339.60					
110. Insurance	10,591.84	9,233.46	1,622.28					
112. Pensions	720.00	599.14	169.32					
113. Stationery and Printing	5,032.60	4,187.80	1,183.47					
113-A Valuation Expenses	8,207.87	6,809.25	1,924.29					
114. Other Expenses	3,266.22	2,717.93	768.08					
115. Gen'l Administ'n Jt. Trks. & Terms, Dr.	555.34	150.65	91.94					
116. Gen'l Administ'n Jt. Trks. & Terms, Cr.	*197.00	*197.00	*55.71					
Total General Expenses	137,589.52	119,934.39	23,886.39		13,625.99	4,781.79	2,436.15	3,042.46
*Deduct.								
Grand Total Operating Expenses	2,763,996.68	2,305,555.85	641,512.65	17,148.99	356,168.24	124,990.76	63,678.17	79,526.49

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Operating Expenses.

Year Ending June 30th, 1914.

	System	Total Michigan	Michigan Passenger	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
Grand Total Operating Expenses	$2,763,996.68	$2,305,455.85	$641,512.65	$17,148.99	$356,168.24	$124,990.76	$63,878.17	$79,526.49
Deduct account of Factor 11-E, used instead of Factor 16-B on account 6-A			4,354.43		2,026.68	1,144.10	587.29	596.36
Deduct account reduction above will make in Account No. 1			147.41		68.60	38.73	19.89	20.19
Corrected Operating Expenses	$2,763,996.68	$2,305,455.85	$637,010.81	$17,148.99	$354,072.96	$123,807.93	$63,070.99	$78,909.94
For uniformity with 1915, 1916 and 1917, add expenses of Sleepers and Diners, which are included in the 1915, 1916 and 1917 figures	78,414.32	62,616.00	62,616.00			18,539.83	44,076.17	
	$2,842,411.00	$2,368,071.85	$699,626.81	$17,148.99	$354,072.96	$142,347.76	$107,147.16	$78,909.94
The above deductions would affect MAINTENANCE OF WAY AND STRUCTURES total as follows	$ 795,084.15	$ 646,615.43	$168,158.76		$78,845.43	$43,813.09	$22,469.18	$23,031.06
Deductions			4,501.84		2,095.28	1,182.83	607.18	616.55
Corrected figures MAINTENANCE OF WAY AND STRUCTURES	$ 795,084.15	$ 646,615.43	$163,658.92		$76,750.15	$42,630.26	$21,862.00	$22,415.51

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Assignment of Passenger and Baggage Expenses to INTER and INTRA.

Year Ending June 30th, 1914.

	Total Passenger & Baggage			Inter	Intra
I. MAINTENANCE OF WAY AND STRUCTURES	$76,750.15				
Account 16-B Station Buildings	790.44	on Intra, Factor	1	$ 108.42	$ 682.02
Overhead accts. 1, 18, 19, 20, 21, 22 and 23	2,608.80	" " "	3	915.59	1,693.21
All other accounts	73,351.91	" " "	2	25,912.40	47,438.51
II. MAINTENANCE OF EQUIPMENT	51,818.83	on Intra, Factor	2	18,306.29	33,512.54
III. TRAFFIC EXPENSES	46,213.54				
Account 54, Outside Agencies	23,152.55	on Intra, Factor	4-A	21,307.29	1,845.26
Account 55, Advertising	4,185.36	" " "	4-B	2,890.41	1,294.95
Accounts 58, 59	7,018.30	" " "	2	2,479.39	4,538.91
Account 53	11,857.33	" " "	5	9,200.97	2,656.36
IV. TRANSPORTATION EXPENSES	$165,664.45				
Accounts 62 and 66 Stations	18,742.81	on Intra, Factor	1	2,570.90	16,171.91
Overhead Accts. 61, 94, 97, 98, 104 and 105	3,736.88	" " "	6	1,226.67	2,510.21
All other accounts	143,184.76	" " "	2	50,583.60	92,601.16
V. GENERAL EXPENSES	13,625.99	on Intra, Factor	7	5,423.84	8,202.15
				$140,925.77	$213,147.19
Directly located to Inter in above expenses.					
Add to INTER, deduct from INTRA					
Acc't 22, Soo Bridge	22.52	Factor 18-11	55.0039%	12.38	*12.38
Acc't 104, Soo Bridge	95.54	All		95.54	*95.54
				$141,033.69	$213,039.27

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Earnings Year Ending June 30th, 1914.

	System	Total	MICHIGAN							
			Freight	Mineral Range	Total	Sleepers & Diners	Mail & Express	—Passenger and Baggage— Total	Interstate	Intrastate
1. Freight	$2,091,596.65	$1,818,060.76	$1,818,060.76							
2. Passenger	1,104,470.99	954,036.98			$954,036.98			$954,036.98	$334,103.37	$619,923.61
3. Excess Baggage	9,100.64	8,410.92			8,410.92			8,410.92	2,566.60	5,844.32
5. Mail	67,507.36	54,434.12			54,434.12		$54,434.12			
6. Express	32,572.43	29,658.90			29,658.90		29,658.90			
7. Milk-Pass. Trains	549.07	315.72			315.72			315.72		315.72
8. Other Pass. Trs.	7,754.90	1,682.41			1,682.41			1,682.41	734.42	947.99
" " "		15,475.00		737.00	4,735.00					
" " "						S $92.17	524.02	2,865.07	1,003.35	
9. Switching	15,788.35	8,614.94	8,614.94			D 456.74				
10. Specl. Trn. Serv.	3,044.17	2,436.67	1,361.39		1,075.28			1,075.28	25.00	1,050.28
11. Miscl. Transp'n	3,742.43	3,503.82	3,503.82							
12. Sta. & Tru. Prvl.	600.00	498.12			498.12			498.12	174.44	‡323.68
13. Parcel Room	78.75	78.75			78.75			78.75	27.58	‡51.17
14. Storage—Frght	306.45	300.89	300.89							
15. Storage—Bag'ge	66.00	66.00			66.00			66.00	23.11	‡42.89
16. Car Service	5,913.60	5,720.10	5,720.10							
17. Teleg. and Tel.	593.41	583.43	373.51		209.92			209.92	73.51	‡136.41
19. Rent Bldgs., Etc.	10,176.71	9,826.46	8,762.35		1,064.11			1,064.11	372.65	‡691.46
19. Miscellaneous	48,620.52	48,518.91	47,335.43		1,183.48			1,183.48	414.46	‡769.02
20. Jct. Facil. Dr.	*697.41	*697.41	*408.07		*289.34			*289.34	*101.55	*‡187.79
21. Jct. Facil. Cr.	9,094.13	2,941.92	1,871.87		1,070.05			1,070.05	425.05	‡645.00
	$3,410,884.20	$2,954,467.41	$1,895,496.99	$737.00	$1,058,233.42	$ 1,348.91	$ 84,617.04	$972,267.47	$339,841.99	$632,425.48
Sleeping Cars	40,017.38	30,481.51			30,481.51	30,481.51				
Dining Cars	43,051.78	34,966.48			34,966.48	34,966.48				
	$3,493,953.36	$3,019,915.40	$1,895,496.99	$737.00	$1,123,681.41	$ 66,796.90	$ 84,617.04	$972,267.47	$339,841.99	$632,425.48

*Deduct.
†On one-half each on accounts 80 and 88. Interstate on earnings.
‡On earnings.
§Partly allocated. Partly on earnings.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Income Account Down to Net Returns Applicable to Return on Investment. Passenger Business State of Michigan. Year Ending June 30th, 1914.

	Mineral Range Run	Total D.S.S.& A. Passenger	D.S.S.&A.Ry. Passenger Sleepers	Diners	Mail & Express	Passenger & Baggage	Passenger Interstate	& Baggage Intrastate
1. Earnings	$ 737.00	$1,123,681.41	$31,373.68	$35,423.22	$64,617.04	$972,267.47	$339,841.99	$632,425.48
2. Expenses	17,148.99	682,477.82	142,347.76	107,147.16	78,909.94	354,072.96	141,033.69	213,039.27
3. Net to Income	*16,411.99	441,203.59	*110,974.08	*71,723.94	5,707.10	618,194.51	198,808.30	419,386.21
4. Track Rent, Ishpeming to Marquette, C.& N.W.Ry†		1,047.11	197.17	100.94	115.81	633.19	221.74	411.45
5. Track Rental Negaunee to Calumet†	957.13	5,611.84	1,056.71	540.98	620.67	3,393.48	1,189.10	2,204.38
6. Track Rental Houghton to Pilgrim $1,215.32 on earnings, 35.98%‡		437.27	116.27	60.08	60.39	200.53	70.23	130.30
7. Land Negaunee Pass Station§		150.00				150.00	52.52	97.48
8. Union Depot Tks Negaunee, $57.01 on earnings, 35.98%§		20.51	5.45	2.82	2.84	9.40	3.29	6.11
9. Yd. Tks at Soo, $581.10 on earnings 35.98%§		209.08	55.59	28.73	28.87	95.89	33.58	62.31
	*15,454.86	448,679.40	*109,542.89	*70,990.39	6,535.68	622,677.00	*200,378.76	*422,298.24
10. Hire of Equipment		1,272.30	1,397.79			125.49	43.95	81.54
11. Taxes	*15,454.86	449,951.70	*108,145.10	70,990.39	6,535.68	622,551.51	200,334.81	422,216.70
Michigan, $256,059.62 Factor 12-B Passenger $72,362.19 On line 2 this exhibit	*1,773.74	*70,588.45	*14,723.02	*11,082.20	*8,161.59	*36,621.64	*14,587.06	*22,034.58
	*17,228.60	379,363.25	*122,868.12	*82,072.59	*1,625.91	585,929.87	185,747.75	400,182.12

*Deduct.

N. B. Above distribution of Taxes is on the expense basis.
Also $6,104.46 Income on investments and interest is left an open matter for adjudication.
It contains interest accrued on the trust fund for possible redemption of fare in excess of 2c per mile and other items not conected with the operation of the property as a carrier.

†Assigned on basis one half each accounts 80 and 88 to services, and to Intra on earnings.
‡Assigned on basis Factor 17-28 to services, and to Intra on earnings.
§Assigned on basis earnings to Intra.

Factor 1

1915

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Percentages of Maintenance of Way & Structures Accounts. Less Account 244—Dock Depreciation.

		Michigan	
Accts. 202 to 225 A. 241 to 267 & 272 less 244	$385,453.64 / 497,223.76	77.5212%	1
			2
Accts. 202 to 225, 245 to 267 & 272	382,471.65 / 494,248.77	77.3859%	3
			4
Accts. 202 to 243 247 to 267 & 272	402,578.33 / 517,411.61	77.8058%	5
			6
	Michigan Passenger	Percentages	7
Accts. 202 to 225, 241 to 267 & 272	115,642.31 / 385,453.64	30.0016%	8 9
			10
Accts. 202 to 243, 247 to 267 & 272 less 229 & 227-B	119,809.79 / 401,282.20	29.8563%	11
			12
			13
			14
			15
			16
Accts. 202 to 225 247 to 267 & 272	Passenger & Baggage	552,623.33	45.5051%
	Sleepers	30,124.89	26.0500% 17
	Diners	16,137.04	13.9542%
	Mail & Express	16,757.35	14.4907% 18
Accts. 202 to 272 less 227-B, 229, 266 and 271	Passenger & Baggage	$55,717.29	46.1360%
	Sleepers	31,043.46	25.7052% 19
	Diners	16,581.79	13.7303%
	Mail & Express	17,424.97	14.4285% 20

Factor 2

1915

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Percentages of Maintenance of Equipment Accounts.

		Michigan	
Accts. 308, 314, 317, 326	$251,414.91		
	296,407.33	84.8307%	1
Accts. 308 to 328	340,553.18		
	401,220.46	84.8793%	3
	Michigan Passenger		
Accts. 308, 314, 317, 326	76,477.74		
	251,414.91	30.4189%	6
Accts. 308 to 328	93,548.38		
	340,553.18	27.4695%	8
Mineral Range RR.	3,311.73		
	76,085.19	4.3527%	10

Accts. 308, 317, 326	$73,156.01	Passenger & Baggage	$39,941.08	54.5972%	
		Sleepers	13,129.05	17.9466%	
Less Mineral Range RR.		Diners	8,090.71	11.0595%	
		Mail & Express	11,995.17	16.3967%	16

Factor 4

1915

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Factor for assignment of Engine House Repairs.

	System	—Michigan—		Passenger
Acct. 388				
Eng. Hs. Exps-Yard	$12,912.41	22.3689%	$12,912.41	
Acct. 400				
Eng. Hs. Exps-Train	44,812.41		38,018.85	44.8955%

1916 test shows engines handled at all round houses as follows:
Total 12,785. Passenger 5,739 or 44.8955%

1915 Factor 5

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

A—Fuel Accounts in Transportation Expenses.
B—Water Accounts in Transportation Expenses.

		System	Michigan	
A.	Account 382	$21,417.29	$21,417.29	8.7542%
	Account 394	267,712.44	223,235.00	91.2458%
		289,129.73	244,652.29	
			84.6168%	
B.	Account 385	1,213.26	1,213.26	9.0115%
	Account 397	14,694.87	12,250.22	90.9885%
		15,908.13	13,463.48	
			84.6327%	
		Michigan	Passenger	
C.	Account 385	1,213.26	41.01	
	Account 397	12,250.22	4,703.46	
		13,463.48	4,744.47	35.2396%
D.	Account 382	21,417.29	723.90	
	Account 394	223,235.00	85,654.77	
		244,652.29	86,378.67	35.3067%

Duluth South Shore & Atlantic Railway Company.

Engine Miles—Road.

	—System—			—Michigan—			
	Total	Freight	Psngr.	Total	Freight	Psngr.	
Freight	836,929	836,929		*697,148	697,148		
Passenger	932,617		932,617	*770,829		770,829	1
Mixed	16,497	13,082	#3,415	16,497	13,082	#3,415	2
Spl. Passenger	575		575	473		473	3
Spl. Mixed	936	742	194	827	656	171	4
Road Swi.	119,483	117,263	2,220	99,040	96,820	2,220	5
M. R. R. R.	42,577		42,577	42,577		42,577	6
	1,949,614	968,016	981,598	1,627,391	807,706	819,685	9

6—A. All road loco. miles to Michigan

1,627,391 83.4725%

1,949,614

6—C. All frt. loco. miles to Michigan

807,706 83.4393%

968,016

6—D. All Pass. loco. miles to Michigan

819,685 83.5052%

981,598

6—E. Pass. train loco. miles to Michigan

770,829 82.6523%

932,617

6—E. Frt. Rd. & Rd. Swi. miles to Michigan

793,968 83.2084%

954,192

6—G. Spl. loco. miles to Michigan

P 644 42.62%

F 656 43.42%

1,511

6—H. Pass. Rd. & Swi. to Michigan

815,626 83.4474%

977,414

6—I. Frt. including Rd. Swi. to Michigan

793,968 83.2084%

954,192

6—K. Pass. including Rd. Switch to Michigan

773,049 82.6934%

934,837

6—L. Spl. Train miles to Pass.

644 49.5385%

1,300

6—M. Loco. miles less M. R. R. R.

777,108 49.0347%

1,584,814

#20.70% to Passenger based on car miles.

*Includes 27,522 light locomotives—Freight.

*Includes 11,434 light locomotives—Passenger.

Duluth South Shore & Atlantic Railway Company.

Passenger Car Miles
Does not include D. S. S. & A. Ry. Sleepers.

	System		Michigan		
	Passenger Coaches	Other Pass. Cars	Passenger Coaches	Other Pass. Cars	
D. S. S. & A. coaches	1,785,209		1,467,071		1
Mail, Exp. Baggage etc.		872,719		710,841	2
Foreign Diners		87,145		87,145	3
D. S. S. & A. Ry. Diners		350,884		296,348	4
C&NW and CM&StP cars in DSS&ARy trains	212,326	152,915	212,326	152,915	5
	1,997,535	1,463,663	1,679,397	1,247,249	6
DSS&ARy cars on Mineral Range RR	74,654	69,530	74,654	69,530	7
	2,072,189	1,533,193	1,754,051	1,316,779	8
Foreign Sleepers Parlor & Obv. cars		211,949		211,142	9
DSS&ARy Sleepers		694,107		527,327	10
Pass. cars on C&NW and CM&StP trains	66,470	32,623	66,470	32,623	11
Do Sleepers		4,380		4,380	
	2,138,659	2,476,252	1,820,521	2,092,251	12
Mineral Range cars paid for * Deduct	*6,318		*6,318		13

7-A Cars on which D. S. S. & A. Ry. made repairs
Lines 1, 2, 7 & 13 — 137,866 — Mineral Range — 4.9312%
2,177,912 — 77.8995%
2,795,794

7-B Car miles taken account of by Car Accountant (which will agree with Companys miles, although latter is incomplete—see above.)
3,665,925 — 83.9412%
4,367,254

7-C Car miles Passenger, less Mineral Range, and freight car miles.
3,768,588
14,319,351 from Factor 8

Factor 8

1915

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Freight Car Miles.

	System		Michigan		
Loaded cars	11,557,447		DSS&ARy	3,323,404	
			Foreign	6,429.042	
Empty cars	4,942,343		DSS&ARy	1,729,349	
			Foreign	2,446,912	
Mixed-loaded	125,272	Mx. & Spl.	DSS&ARy	44,268	
		"	Foreign	90,708	
Mixed-empty	58,619	"	DSS&ARy	23,068	
Special-loaded	7,734	"	Foreign	32,600	
	16,691,415			14,319,351	
Caboose cars	779,334			642,678	
Spl. caboose	868			759	
	17,471,617			14,962,788	85.6405%
			Less caboose	14,319,351	

Factor 9

1915

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Transportation Percentages.

Except accts. 371, 390, 391, 407, 410, 411, 412, 413 & 414.

A

To Michigan	933,726.59	86.0978%
includes account 414	1,084,495.94	

Michigan Passenger

B	294,063.91	31.1930%
	933,726.59	

Mineral Range RR

C	11,982.87	4.0749%
	294,063.91	

To Services		Passenger
All accts. except 371, 390, 391, 407, 410, 411, 412, 413, 414, 415 and 420		$275,461.25
Passenger & Baggage	$145,639.53	52.8712%
Sleepers	66,562.96	24.1642%
Diners	29,128.50	10.5744%
Mail & Express	34,130.26	12.3902%

Factor 10

1915

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Car Accountants Office.

		System
		$4,424.65
Estimated Passenger 15%		$ 663.70
Freight 85%		3,760.95
To Michigan on Car Miles	Factor 7-B	$ 663.70

1915

Duluth South Shore & Atlantic Railway Company.

Train Mileage.

	—System—			—Michigan—		
	Total	Freight	Psngr.	Total	Freight	Psngr.
Road	1,704,543	796,075	908,468	1,409,218	659,025	750,193
Mixed	16,497	13,082	3,415	16,497	13,082	3,415
Special Pass.	477		477	417		417
Special Mixed	783	621	162	674	534	140
	1,722,300	809,778	912,522	1,426.806	672,641	754,165
Rd. Switch	119,483	117,263	2,220	99,040	96,820	2,220
	1,841,783	927,041	914,742	1,525,846	769,461	756,385
M. R. R. R.	48,895		48,895	48,895		48,895
*Deduct	*6,318	Paid for	*6,318	*6,318	Paid for	*6,318
	1,884,360	927,041	957,319	1,568,423	769,461	798,962
C.M.&St.P.Ry. own trains	21,948		21,948	21,948		21,948
C.&N.W.Ry. own trains	10,950		10,950	10,950		10,950
	1,917,258	927,041	990,217	1,601,321	769,461	831,860
Lt. Locos.	44,783	29,871	14,912	28,786	27,387	11,399

11—A. All frt. trn. miles into Michigan

769,461 83.0018%

927,041

11—B. All Pass. Trn. miles into Michigan

MR 42,577 4.4475%

756,385 79.0108%

957,319

11—E. Miles less M. R. R. R. plus switch from Factor 15

F 995,236

P 807,970 44.8074%

1,803,206

11—F. Miles less Road switch and M. R. R. R.—plus lt. locos. and plus switch yard.

F 908,416

P 805,750 47.0054%

1,714,166

Factor 11 *Continued*

1915

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Train Mileage.

11—C. Trn. miles Mich. including Rd. switch and light locos. —excluding M. R. R. R.

F	780,850	
P	816,660	51.1208%
	1,597,510	

11—D. Trn. miles Switch & Road & Lt.Locos. made on Main track Michigan (Factor 15 included), M. R. R. R. excluded.

P	771,969	43.0176%
F	1,022,574	

11—G. All frt. miles, less mixed, into Michigan.

	756,379	82.7585%
	913,959	

11—H. All Pass. miles, less mixed —plus M.R.R.R. into Mich.

MR	42,577	4.2577%
	752,970	78.9356%
	953,904	

Factor 12

1915

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Accounts up to General Expenses.

		System	Michigan	
I	Maintenance of Way & Structures	$570,978.34	$444,893.44	1
II	Maintenance of Equipment	426,747.58	361,695.31	2
III	Traffic Expenses	95,366.61	79,448.26	3
IV	Transportation Expenses	1,141,875.13	963,954.48	4
VI	Miscellaneous Operation	45,006.24	36,477.56	5
		2,279,967.90	1,886,469.05	6
			82.7410%	

		Michigan	Passenger	
I	Maintenance of Way & Structures	$444,893.44	$125,187.35	7
II	Maintenance of Equipment	361,695.31	99,675.76	8
III	Traffic Expenses	79,448.26	40,019.14	9
IV	Transportation Expenses	963,954.48	303,897.02	10
VI	Miscellaneous Operation	36,477.56	36,477.56	11
		1,886,469.05	605,256.83	12
			32.0841%	

% Less overhead also 32.0879 % 13

Passenger to Services.

All accounts, less acct. 227-B, and $40.73 on account 279, both of which are overheads, and less Mineral Range RR. 15

	Total Passenger	$588,958.86	
Passenger & Baggage	$302,188.99	51.3090%	
Sleepers	120,916.79	20.5306%	17
Diners	96,363.46	16.3617%	&
Mail & Express	69,489.62	11.7987%	18

Factor 13

1915

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Gross Weights—Trains.

A.	—Freight—		—Passenger—		
	All Tracks	Common Tracks	All Tracks	Common Tracks	
Cars	247,749,151	247,749,151	166,302,726	166,302,766	1
Locomotives	80,645,501	80,645,501	83,591,522	83,591,522	2
Loading	181,491,806	181,491,806	7,866,130	7,866,130	3
Total train wts	509,886,458	509,886,458	257,760,378	257,760,378	4
Train switching	17,281,111	9,839,864	349,357	349,357	7
Yard switching	45,142,353	20,332,985	965,848	451,148	8
	572,309,922	540,059,307	259,075,583	258,560,883	9
Ton miles Co's freight (est)	7,792,466	7,792,466			10
Total gross wts	580,102,388	547,851,773	259,075,583	258,560,883	11
				32.0631%	12
Above includes Co frt and wts of cars carrying same	14,021,277	14,021,277			

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Mileage of track chargeable to services and percentages of same on basis of 2 miles side track equals 1 mile main track.

	Miles	Adjusted 2 to 1	
Common to Freight & Passenger			
Main track	408.78	408.78	
Second track	6.55	6.55	
Sidings	40.56	20.28	
	455.89	435.61	82.5285%
Exclusive freight			
Main track	12.47	12.47	
Ore Spurs	22.21	11.11	
Industrial Spurs	21.89	10.94	
Sidings	113.29	56.65	
	169.86	91.17	17.2726%
Exclusive passenger			
Sidings	2.10	1.05	.1989%

Factor 15

1915

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Switching Miles.—Michigan.

		— Freight —		— Passenger —	
Yards		Total	On Common Tracks	Total	On Common Tracks
Freight	96.62%	208,388	90,414		
Passenger	3.38%			7,288	3,404
Train					
Freight		96,820	55,129		
Passenger				2,220	2,220

Factor 16

1915

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Combining Factors 13, 14 and 15 for division of Track Accounts in Michigan.

		Percentage		Passenger
A.	Freight (Factor 14)	17.2726		
	Passenger Factor 14	.1989		.1989%
	Common Factor 14	82.5285	Factor 13	26.4612%
	Total passenger percent weights			26.6601%
B.	Freight Factor 14	17.2726		
	Passenger Factor 14	.1989		.1989%
	Common Factor 14	82.5285	Factor 11-D	35.5018%
	Total Passenger percent train miles			35.7007%

Duluth South Shore & Atlantic Railway

Details of weights ton miles of Passenger cars and contents to various passenger services.

A

		Passenger & Baggage	Mail and Express	Sleepers	Diners	
Pass. Cars			635,766			1
Other Pass trn. cars			21,113,903			2
Slprs, Parlor & Obs—For.				15,040,560		3
Dining cars Foreign					5,847,430	4
Sleepers DSS&ARy.				30,410,311		5
Obs. Diners DSS&ARy.					11,414,151	6
Diners DSS&ARy.					7,085,560	7
Train Loading			3,525,387			8
Total Train	174,1[illegible]3,856		25,275,056	45,450,871	24,347,141	9
		45.5225%	14.4828%	26.0436%	13.9511%	10
Pass Swi	349,357		58,226			11
	174,518,213		25,333,282	45,450,871	24,347,141	
		45.4892%	14.5161%	26.0436%	13.9511%	12
P. Yd. Swi	451,148		17,505	187,518	100,450	13
	174,969,361		25,350,787	45,628,389	24,447,591	14
		45.4609%	14.4837%	26.0779%	13.9725%	15

B Tonnages handled by D. S. S. & A. Engines

Pass. Cars	59,901,676		635,766			16
Other Pass Cars	33,484,413		21,136,451			17
Slpr, Prlr & Obvs—For.	14,720,820			14,720,820		18
Diners Foreign	5,847,430				5,847,430	19
Sleepers DSS&ARy.	30,410,311			30,410,311		20
Obvs. Diners DSS&ARy	11,414,151				11,414,151	21
Diners DSS&ARy	7,085,560				7,085,560	22
	162,864,366		21,772,217	45,131,131	24,347,141	23
Train Loading	7,541,650		3,200,907			
	170,406,016		24,973,124	45,131,131	24,347,141	24
		44.5727%	14.6551%	26.4845%	14.2877%	25
Pass Trn Switch	349,357		58,226			26
	170,755,373		25,031,350	45,131,131	24,347,141	27
		44.6520%	14.6592%	26.4303%	14.2585%	28

Factor 18

1915.

Duluth South Shore & Atlantic Railway.

Details of car miles on passenger trains, to various passenger services.

	Total	Passenger & Baggage	Mail and Express	Sleepers	Diners	
Passenger Cars	1,675,964	1,650,482	25,482			1
Pass. Cars Special	3,433	3,433				2
Other Pass. Trn. Cars	862,350	324,706	538,644			3
" " " Spl.	406	406				4
D.S.S.& A. Obsv. & Diners	179,976				179,976	5
" Diners	116,372				116,372	6
Foreign Diners	87,145				87,145	7
" Slprs. & Obv.	210,903			210,903		8
" Slprs &c Spl.	239			239		
D.S.S.& A. Slprs & Prlr	527,327			527,327		9
	3,768,583	1,979,027	564,126	738,469	383,493	10
Percentages		53.9963%	15.3918%	20.1486%	10.4633%	11
C.&N.W.&C.M.&St.P.Rys.	103,473	97,970	1,123	4,380		12
Marquette Run						
	3,768,583	2,076,997	565,249	742,849	383,493	13
Percentage		55.1124%	14.9990%	19.7116%	10.1769%	14
D.S.S.& A. cars on M.R.R.R.	74,654	74,654				15
" other cars M.R.R.R.	69,590	26,129	43,461			16
	3,912,772	2,177,780	608,660	742,849	383,493	17
Percentage		55.6582%	15.5556%	18.9853%	9.8011%	18
Cars handled		44.42%	4.99%	33.99%	17.20%	19
Switching St Ignace	2,034	1,098	283	454	219	21
		53.9822%	12.9903%	23.2206%	10.7069%	22
Lines 1 to 4 564,126	23.1823% Mail & Express.					
2,543,153						

1915

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Factor for assignment of Passenger & Baggage. Expenses to Inter & Intra.

Factor Intra 1 to 7

Factor 1. Time consumed in coupon ticket sales by actual test was 5.75 times that consumed in simplex tickets. That Mineral Range coupon tickets did not participate in the above time ratio being sold in the same average time as simplex tickets. Tests applied to sales is as follows:

	No. of tickets			Adjusted	
	Intra No.	Inter		Intra	Inter
Simplex	358,549	6,971	A-1	358,549	6,971
M. R. coupons	46,804		A-1	46,804	
Other coupons	11,701	12,498	A-5.75	67,281	72,439
Mileage Exch.	13,622	355	A-5.75	78,337	2,031
				550,971	81,441
				87.1222%	

Factor 2. Intra-State Passenger Mile percentage
Inter 8,597,088
Intra 20,341,201—70.2916%

Factor 3. Over head for Maintaining of Way & Structures
Inter $15,988.33
Intra 38,752.11—70.7925%

Factor 4. By investigation conducted in part by Mr. Heiss and therefore called the Heiss percentage the intra % in this road of the following accts was determined. Set up by the Ry Co and accepted by us.
A. Outside Agencies 7.97% Intra
B. Advertising 30.94% Intra

Factor 5.
Over head for Traffic Expenses
Inter $ 20,982.85
Intra 7,306.69—25.8282%

Factor 6. Over head for Transportation Expenses
Inter $ 40,505.34
Intra 107,149.66—72.5672%

Factor 7. Over head for General Expenses
Inter $102,932.24
Intra 196,366.47—65.6089%

1915

Duluth, South Shore & Atlantic Railway

DISTRIBUTION OF

OPERATING EXPENSES

BY PRIMARY ACCOUNTS

A. System.
Michigan Passenger.
Michigan Passenger Services.

Followed by Tabulation of these Accounts.

B. Assignment of Passenger and Baggage Expenses to INTER and INTRA.

C. Distribution of Income Accounts up to return on Investment.

The basic figures as used in the following computations and divisions of Expenses are used as taken from the books and records of the company, without adjustment for the purpose of reducing them to those necessary for a normal year of operation and are subject to adjustment to be made to eliminate expenditures to make good deferred maintenance, and those for additions and betterments.

It is the claim of defendants that the expenses in the maintenance of way group of these years were excessive in at least the amount of

1914	$202,000
1915	20,000
1916	17,000
1917	90,000

The presentation of the following computations of income is not intended to waive the claim that the passenger earnings of the M. T. Co. are to be added to the net corporate income of the passenger business, particularly if sleeping car and dining car operations are to be included.

Duluth South Shore & Atlantic Railway Company.

Details of Distribution of Operating Expenses by Primary Accounts for the year ending June 30th, 1915.

Account 201 Superintendence Maintenance of Way and Structures.

	System	Michigan	Passenger
	$22,330.89		
Factor 1-5		$17,374.75	
To Passenger Factor 1-11			$5,187.46

Assignment of Passenger to Services.

Passenger & Baggage	Factor 1	Line 20	$2,393.29
Sleepers	" 1	" 20	1,333.45
Diners	" 1	" 20	712.25
Mail & Express	" 1	" 20	748.47

Account 202 Roadway Maintenance.

	System	Michigan	Passenger
	$47,209.21		
Located by Mutual Audit Co.		$39,269.32	
To Passenger Factor 11-C			$20,074.79

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17,	Line 15	$9,126.18
Sleepers	" 17	" 15	5,235.08
Diners	" 17	" 15	2,804.95
Mail & Express	" 17	" 15	2,908.58

Account 208 Bridges, Trestles & Culverts.

	Wisconsin	Michigan	Common
Located by Mutual Audit	$47,422.74	$39,247.47	$265.36
Common on located	145.20	120.16	
Michigan Total		$39,367.63	
	Freight	Common	
Freight 4.2959% (1916 analysis)	$1,691.19		
		$37,676.44	
Com. to Passenger on Factor 13-12			$12,083.23

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17,	Line 15	$5,491.78
Sleepers	" 17,	" 15	3,150.27
Diners	" 17,	" 15	1,687.91
Mail & Express	" 17,	" 15	1,750.27

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account 212 TIES.

	System	Michigan	Passenger
	$95,351.57		
Located		$79,392.98	
Factor 16			$21,166.25

Assignment of Passenger to Services.

Passenger & Baggage,	Factor	17,	Line 15	$9,622.37
Sleepers	"	17,	" 15	5,519.71
Diners	"	17,	" 15	2,957.45
Mail & Express	"	17,	" 15	3,066.72

Account 214 RAILS.

	System	Michigan	Passenger
	$20,682.25		
Located		$19,782.04	
Factor 16			$5,273.91

Assignment of Passenger to Services.

Passenger & Baggage,	Factor	17,	Line 15	$2,397.57
Sleepers	"	17,	" 15	1,375.32
Diners	"	17,	" 15	736.90
Mail & Express	"	17,	" 15	764.12

Account 216 OTHER TRACK MATERIAL.

	System	Michigan	Passenger
	$23,469.14		
Located		$21,806.14	
Factor 16			$5,813.61

Assignment of Passenger to Services.

Passenger & Baggage,	Factor	17,	Line 15	$2,642.92
Sleepers	"	17,	" 15	1,516.07
Diners	"	17,	" 15	812.31
Mail & Express	"	17,	" 15	842.31

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account		System	Michigan	Passenger
218	BALLAST.			
		$10,362.04		
	Located		$9,703.48	
	Factor 16			$2,586.96
	Assignment of Passenger to Services.			
	Passenger & Baggage, Factor 17, Line 15			$1,176.06
	Sleepers " 17, " 15			674.62
	Diners " 17, " 15			361.46
	Mail & Express " 17, " 15			374.82
Account				
220	TRACK LAYING & SURFACING.			
		System	Michigan	Passenger
		$178,066.55		
	Located by Mutual Audit Co.		$145,548.03	
	Factor 16			$38,803.25
	Assignment of Passenger to Services.			
	Passenger & Baggage, Factor 17, Line 15			$17,640.31
	Sleepers " 17, " 15			10,119.07
	Diners " 17, " 15			5,421.78
	Mail & Express " 17, " 15			5,622.09
Account				
221	RIGHT OF WAY FENCES.			
		System	Michigan	Passenger
		$5,616.46		
	Located		$3,309.43	
	Factor 11-E			$1,475.51
	Assignment of Passenger to Services.			
	Passenger & Baggage, Factor 17, Line 15			$670.78
	Sleepers " 17, " 15			384.78
	Diners " 17, " 15			206.17
	Mail & Express " 17, " 15			213.78

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account		System	Michigan	Passenger
223	SNOW & SAND FENCES & SNOW FENCES.			
		$244.46		
	Located		$199.11	
	Factor 11-E			$89.21

Assignment of Passenger to Services.

Passenger & Baggage,	Factor	17,	Line	15	$40.56
Sleepers	"	17,	"	15	23.26
Diners	"	17,	"	15	12.46
Mail & Express	"	17,	"	15	12.93

Account		System	Michigan	Passenger
225	CROSSINGS & SIGNS.			
		$1,657.27		
	Located		$1,303.65	

Michigan	Freight	Common	
Located	$126.67	$1,176.98	
Common to passenger	Factor 11-E		$527.37

Assignment of Passenger to Services.

Passenger & Baggage,	Factor	17,	Line	15	$239.75
Sleepers	"	17,	"	15	137.53
Diners	"	17,	"	15	73.68
Mail & Express	"	17,	"	15	76.41

Details of Distribution of Operating Expenses (Continued).

Account
227 STATION & OFFICE BUILDINGS.

	System	Michigan	Passenger
	$7,088.60		
A. Station Building & Ground, located		$5,372.82	
B. Office Building & Ground	$124.52		
To Michigan Factor 12-13		103.18	
C. Track Scales (Freight) Located		931.83	
A. Located to Passenger			$1,351.31
A. Located to Common	$3,620.22		
Common to Passenger on Acct. 373, 15.819%			572.69
Total Passenger			$1,924.00

A. Assignment of Passenger to Services.

Passenger & Baggage	$1,629.02	
Sleepers Acct. 372, 5.326%	102.58	
Mail & Express, 1916 Test, Parker 10%	192.40	
B. $103.18 Factor 12-18		$33.10

Assignment of Passenger to Services.

Passenger & Baggage, Factor 12, Line 18	$16.98	
Sleepers " 12, " 18	6.80	
Diners " 12, " 18	5.42	
Mail & Express " 12, " 18	3.90	

Account
229 ROADWAY BUILDINGS.

	System	Michigan	Passenger
	$1,933.47		
Located		$1,192.95	
Factor 1-9			$357.90

Assignment of Passenger to Services.

Passenger & Baggage, Factor 1, Line 20	$165.12
Sleepers " 1, " 20	92.00
Diners " 1, " 20	49.14
Mail & Express " 1, " 20	51.64

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account
231 WATER STATIONS.

	System	Michigan	Passenger
	$5,065.25		
Factor 5-B		$4,279.21	
Factor 5-C			$1,507.28

Assignment of Passenger to Services.

Passenger & Baggage,	Factor	17,	Line 28	$673.03
Sleepers	"	17,	" 28	398.38
Diners	"	17,	" 28	214.91
Mail & Express	"	17,	" 28	220.96

Account
233 FUEL STATIONS.

	System	Michigan	Passenger
	$2,581.35		
Factor 5-A		$2,184.34	
Factor 5-D			$734.50

Assignment of Passenger to Services.

Passenger & Baggage,	Factor	17,	Line 28	$327.97
Sleepers	"	17,	" 28	194.13
Diners	"	17,	" 28	104.73
Mail & Express	"	17,	" 28	107.67

Account
235 SHOPS & ENGINE HOUSES.

	System	Michigan	Passenger
Shops (Located M. A. Co.)	$1,325.87		
Eng. House (Located M.A.Co.)	2,193.25		
Shops Factor 2-A		$1,124.61	
Eng. Houses Accts. 388 & 400 (88.214%)		1,934.75	

Assigned to Passenger.

A. Shops Factor 2-C	$342.09
B. Eng. Houses Accts. 388 & 400 (31.8918%)	617.03

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

A. Assignment of Passenger to Services.

Passenger & Baggage,	Factor 2,	Line 16	$186.78
Sleepers	" 2,	" 16	61.39
Diners	" 2,	" 16	37.83
Mail & Expres	" 2,	" 16	56.09

B. Accts. 388 & 400 show 2.395% switching $14.87 leaving $602.16.

Assignment of Passenger to Services.

		Switch	Factor	Road
Passenger & Baggage,	Factor 18-14	$8.28	17-28	$268.88
Sleepers	" 18-14	2.94	17-28	159.15
Diners	" 18-14	1.42	17-28	85.86
Mail & Express	" 18-14	2.23	17-28	88.27

Account 241 WHARVES & DOCKS.

	System	Michigan
	$884.16	
A. Located Mdse. Dock (all freight)		$ 46.71
B. Located Slip Dock		837.44

Assigned to passenger on basis of cars handled over slip.
Freight cars counted 1. Passenger cars counted 2. 22.7414%
$837.44 X 22.7414% gives Passenger $190.45.

Assignment of Passenger to Services.

Passenger & Baggage,	Factor 18,	Line 22	$102.80
Sleepers	" 18,	" 22	42.51
Diners	" 18,	" 22	20.51
Mail & Express	" 18,	" 22	24.63

Account 243 COAL & ORE DOCKS. Repairs

System	
$2,090.83	All freight

Account 244 COAL & ORE DOCKS. Depreciation $19.145.88 All freight

Account 247 TELEGRAPH & TELEPHONE LINES.

	System	Michigan	Passenger
	$2,857.26		
Assigned & located, accepted		$2,538.58	
Factor 9-4			$799.73
Split to train & station (see 1914)			
A. Train			$417.60
B. Station			382.13

Assignment of Passenger to Services.

				Factor	
Passenger & Baggage, Factor		17-10A	$190.10	18-11B	$206.34
Sleepers	"	17-10A	108.76	18-11B	76.99
Diners	"	17-10A	58.26	18-11B	39.98
Mail & Express	"	17-10A	60.48	18-11B	58.82

Account 249 SIGNALS & INTERLOCKERS.

	System	Michigan	Passenger
	$491.57		
Located		$197.75	
Spl. factor 5.24% based on time and number of trains using facility			$10.36

Assignment of Passenger to Services.

Passenger & Baggage to Services, Factor		17-10	$4.82
Sleepers	"	17-10	2.72
Diners	"	17-10	1.40
Mail & Express	"	17-10	1.42

Account 267 PAVING.

	System	Michigan	Passenger
	$7.70		
Located		$7.70	
Factor1-11			$2.30

Assignment of Passenger to Services.

Passenger & Baggage	Factor	17-10	$1.07
Sleepers	"	17-10	.60
Diners	"	17-10	.31
Mail & Express	"	17-10	.32

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account 269 ROADWAY MACHINES.

	System	Michigan	Passenger
	$ 845.24		
Located Factor 1-5		$ 657.65	
Factor 1-11			$ 197.31

Assignment of Passenger to Services.

Passenger & Baggage	Factor	1-20	$91.03
Sleepers	"	1-20	50.72
Diners	"	1-20	27.09
Mail & Express	"	1-20	28.47

Account 271 SMALL TOOLS & SUPPLIES.

	System	Michigan	Passenger
	$7,954.55		
Factor 1-5		$6,189.11	
Factor 1-11			$2,456.86

Assignment of Passenger to Services.

Passenger & Baggage	Factor	1-20	$1,133.50
Sleepers	"	1-20	631.54
Diners	"	1-20	337.33
Mail & Express	"	1-20	354.49

Account 272 REMOVING SNOW, SAND & ICE.

	System	Michigan	Passenger
	$21,306.42		
Located		$20,060.23	
Relocate correcting error		20,851.60	
Passenger 1% direct by agreement			$ 208.52
Com. 70% $14,596.12 Factor 11-E			6,540.16

Assignment of Passenger to Services.

Passenger & Baggage	Factor	17-12	$3,069.92
Sleepers	"	17-12	1.757.60
Diners	"	17-12	941.51
Mail & Express	"	17-12	979.65

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account 273 ASSESSMENT FOR PUBLIC IMPROVEMENTS.

	System	Michigan	Passenger
	$ 232.72		
Located		$ $99.45	
Factor 11-E			$44.56
Assignment of Passenger to Services.			
Passenger & Baggage		Factor 1-20	$20.56
Sleepers		" 1-20	11.45
Diners		" 1-20	6.12
Mail & Express		" 1-20	6.43

Account 274 INJURIES TO PERSONS.

	System	Michigan	Passenger
	$2,825.99		
Located		$1,809.93	
$25 located to freight $1,784.93. Factor 1-9			$535.51
Assignment of Passenger to Services.			
Passenger & Baggage,	Factor 1, Line 20		$247.06
Sleepers	" 1, " 20		137.65
Diners	" 1, " 20		73.53
Mail & Express	" 1, " 20		77.27

Account 275 INSURANCE.

	System	Michigan
	$4,532.26	
N. B. Shops $339.68. Factor 2-1		$ 287.89
Other common located		2,115.87
Passenger located		126.70
Freight located		1,396.77
		$3,927.23
Assigned to Passenger.		
A. Direct		$126.70
B. Common $2,403.76 on Accts. 202 & 220		657.66
Total Passenger		$784.36

Assignment of Passenger to Services.

	A.		B.
Passenger & Baggage	$107.39	Factor 1-20	$303.42
Sleepers 5.3268%—Special	6.64		169.05
Diners			90.30
Mail & Express 10.00%—Special	12.67		94.89

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account
276 STATIONERY & PRINTING.

	System	Michigan	Passenger
	$713.09		
Factor 1-5		$554.83	
Factor 1-11			$165.65

Assignment of Passenger to Services.

Passenger & Baggage,	Factor 1, Line 20		$76.43
Sleepers	" 1, " 20		42.58
Diners	" 1, " 20		22.74
Mail & Express	" 1, " 20		23.90

Account
277 OTHER EXPENSES.

	System	Michigan	Passenger
	$104.81		
Factor 1-5		$82.35	
Factor 1-5			$24.59

Assignment of Passenger to Services.

Passenger & Baggage,	Factor 1, Line 20		$11.34
Sleepers	" 1, " 20		6.32
Diners	" 1, " 20		3.38
Mail & Express	" 1, " 20		3.55

Account
278 MAINTAINING JOINT TRACKS, YARDS AND OTHER FACILITIES. DR.

	System	Michigan	Passenger
	$8.505.28		
Located		$6,094.45	
	Freight	Passenger	Common
Michigan			
located (MACo)	$5,423.40	A. $607.69	$66.45
Common Crossing Gates 11-E		B. 29.77	
Total Passenger		$637.46	

Assignment of Passenger to Services.

		A $607.69	Factor	B $29.77
Passenger & Baggage,	Factor	328.13	17-15	13.54
Sleepers	18-11	122.44	"	7.77
Diners	18-11	63.59	"	4.15
Mail & Express	18-11	93.53	"	4.31

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account					
279	MAINTAINING JOINT TRACKS, YARDS AND OTHER FACILITIES.				CR.
		System	Michigan		
		$13,631.52			
	Located		$13,631.52		
		Freight	Common	Passenger	
	Located	$2,719.95			
	Located Stations			$ 610.52	B
	Tracks (C&NW & CM&StP) 25% rental			3,549.08	C
	Track Items,				
	Factor 16, to Passenger		$5,950.61	1,613,21	C
	Bridges, Acct. 208		505.61	140.08	C
	Stations, Acct. 273		21.53	34.13	B
	Soo Round House, Acct. 388 & 400		22.75	7.26	A
	Water & Fuel stations, Factor 5-c		115.34	40.63	A
	General Items		135.75	40.73	C

Assignment of Passenger to Services.

	A	B	C
	17-28	Acct. 273	17-15
Passenger & Baggage	$21.80	$519.84	$2,410.51
Sleepers	12.47	32.70	1,332.75
Diners	6.68	61.39	740.87
Mail & Express	6.94		768.24

*Credits—Deduct.

Account				
301	SUPERINTENDENCE—MAINTENANCE OF EQUIPMENT.			
		System	Michigan	Passenger
		$12,519.96		
	Factor 2-1		$10,619.52	
	Factor 2-6			$3,230.34

Assignment of Passenger to Services.

Passenger & Baggage, Factor	2-16		$1,686.91
Sleepers	"	2-16	554.50
Diners	"	2-16	341,71
Mail & Express	"	2-16	506.61
Mineral Range Run	"	2-16	140.61

Details of Distribution of Operating Expenses (Continued).

Account
302 SHOP MACHINES AND TOOLS.

	System	Michigan	Passenger
	$6,693.95		
Factor 2-1		$5,677.86	
Factor 2-6			$1,727.14

Assignment of Passenger to Services.

Passenger & Baggage,	Factor	2, Line	16	$942.98
Sleepers	"	2, "	16	309.96
Diners	"	2, "	16	191.01
Mail & Express	"	2, "	16	283.19

Account
308 STEAM LOCOMOTIVE REPAIRS.

	System		Michigan
A. Freight located	$41,803.18	Factor 6 F	$34,787.52
B. Switch	11,317.95	all	11,317.95
C. Mineral Range Run Pass.	1,290.07	all	1,290.07
D. Special	63.75	Factor 6-G-F	27.68
		" P	27.17
E. Mixed	339.49	all	339.49
F. Passenger Road Switch	84.94	all	84.94
G. Passenger Road	38,558.71	6 E	31,869.66
Total Michigan			$79,744.48

Assigned to Passenger.

B.	$11,317.95	3.38% established time. ratio of switching	Passenger $382.55
C.			1,290.07
D.			27.17
E.	339.49	Car miles ratio 20.7%	70.27
F.			84.94
G.			31,869.66
			$33,724.66

Assignment of Passenger to Services.

B. Switch			$382.55	C. D. E. F. G.	
Pass. & Baggage,	Factor	18-19	169.93	Factor	$14,311.88
Sleepers	"	18-19	127.73	17-28	8,471.55
Diners	"	18-19	65.80		4,570.14
Mail & Express	"	18-19	19.09		4,698.57

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account
309 STEAM LOCOMOTIVES—DEPRECIATION.

	System	Michigan
	$23,944.92	
Assigned classes of service by individual locomotives and mileages. Assigned to Michigan on mileage of each class. Agreed.		
Classed Freight		$10,661.55
Passenger		5,926.63
Switch		4,054.35

Assigned to Passenger.

A. Direct $5,926.03 includes $292.70 Min. Range
B. Switch 3.38% 137.04

Assignment of Passenger to Services.

A.	Passenger & Baggage,	Factor 17,	Line 28	$2,515.66
	Sleepers	" 17,	" 28	1,489.06
	Diners	" 17,	" 28	803.32
	Mail & Express	" 17,	" 28	825.89
B.	Passenger & Baggage,	Factor 18,	Line 19	$ 60.87
	Sleepers	" 18,	" 19	45.76
	Diners	" 18,	" 19	23.57
	Mail & Express	" 18	" 19	6.84

Account
310 STEAM LOCOMOTIVES. RETIREMENTS.

	System	Michigan
Road Locos.	*$279.34	*$233.19
Switch	46.33	46.33
To Passenger.		
A. Located by mileages and classes		*.80
B. Switch, 3.38%		1.57

A.	Passenger & Baggage,	17-38	*.36	B. Factor .70
	Sleepers	17-38	*.25	18-19 .52
	Diners	17-38	*.11	.27
	Mail & Express	17-38	*.12	.08

*Credit figure—Deduct.

Details of Distribution of Operating Expenses (Continued).

Account		System	Michigan
314	FREIGHT TRAIN CARS REPAIRS.	$146,912.18	$125,815.59
315	FREIGHT TRAIN CARS DEPN.	62,765.78	53,752.61
316	FREIGHT TRAIN CARS RETIREMENT.	2,151.16	1,842.75

By figures—accepted.

Account 317 PASSENGER TRAIN CAR REPAIRS.

	System	Michigan
A. Regular	$ 40,997.34	
Factor 7-A. Min. Range		$ 2,021.66
Regular		31,936.60
B. Sleepers (1914 figures)	5,454.97	
Factor 7-10		4,182.44
C. Diners (1914 figures)	3,850.21	
Factor 7-9		3,268.66
	Total Michigan	$41,409.36

Assignment of Passenger to Services.

Mineral Range Run		$ 2,021.66
Passenger & Baggage,	Factor 18-23	24,852.36
Sleepers Direct		4,182.44
Diners Direct		3,268.66
Mail & Express	Factor 18-23	7,084.24

Account 318 PASSENGER TRAIN CAR DEPN.

	System	Factor	Michigan
Passenger Cars	$7,261.74	7-A	$6,015.14
Sleepers	2,684.00	7-10	2,057.88
Diners	2,421.00	7-9	2,055.32

Assignment of Passenger Cars to Services.

Passenger & Baggage,	Factor 18-23	$4,402.18
Mail & Express	" 11-23	1,254.86
Mineral Range Run		358.10
Sleepers Direct		2,057.88
Diners	"	2,055.32

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account 320 WORK EQUIPMENT.

	Repairs	Depn.	Retirement
System	$5,734.54	$3,497.66	$ 319.88
Michigan Factor 1-1	4,445.48	2,711.43	247.97
Passenger " 1-9	1,333.72	813.47	74.39

Assignment of Passenger to Services.

Passenger & Baggage, 1, 17 & 18	Factor	$606.91	$370.17	$33.85
Sleepers	1, 17&18	347.43	211.91	19.38
Diners	1, 17&18	186.11	113.51	10.38
Mail & Express	1, 17&18	193.27	117.88	10.78

Account 332 INJURIES TO PERSONS.

	System	Michigan	Passenger
	$2,830.70		
Factor 7-B cars P	4.50	$ 3.78	
Factor 8-B cars F	1,456.03	1,246.94	
Factor 2-1 com.	1,370.17	1,162.19	
Total Michigan		$2,412.91	
To Passenger—Direct			$ 3.78
Com. $1,370.17 on 2.6			414.65
			$ 418.43

Assignment of Passenger to Services.

Passenger & Baggage	Factor 2-16	$228.45
Sleepers		75.09
Diners		46.28
Mail & Express		68.61

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account					
333	INSURANCE.	System		Michigan	
	A. Pass. Cars	$182.08		$152.80	(8.98 min. P.)
	B. Sleepers	76.80		58.88	
	C. Diners	70.40		59.77	
	D. Freight Cars	609.88		522.30	
	E. Freight Locos.	110.40		92.16	
	F. Passenger Locos.	72.00		59.58	
	G. Switch Locos.	14.80	3.38%	14.80	
	H. Work Egt.	53.04	Factor 1-3	40.98	
	I. Shops	599.40	" 2-1	508.68	

Assignment of Passenger to Services.

			To Passenger Direct		
A. Pass. & Baggage, Factor 18-23		$111.92	A.		$152.80
B. Sleepers Direct		58.88	B.		58.88
C. Diners Direct		59.77	C.		59.77
A. Mail & Express, Factor 18-23		31.90	F.		59.58
Mineral Range		8.98	G.	3.38%	.50
			H.	1–11	12.29
F. & G.			I.	" 2–6	154.73
Passenger & Baggage	Factor 17-28			$26.85	
Sleepers	" 17-28			15.88	
Diners				8.57	
Mail & Express				8.80	

H.					
Pass. & Bag.	Factor 1-17&18	$5.59	I.	Factor 2-16	$84.48
Sleepers		3.21		" 2-16	27.17
Diners		1.71		" 2-16	17.11
Mail & Express		1.78		" 2-16	25.37

Account				
334	STATIONERY & PRINTING	System	Michigan	Passenger
		$1,101.23		
	Factor 2-3		$ 934.39	
	" 2-8			$ 256.67

Assignment of Passenger to Services.

Passenger & Baggage	Factor 2-16	$140.13
Sleepers	" 2-16	46.06
Diners	" 2-16	28.39
Mail & Express	" 2-16	42.09

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account
337 MAINTAINING OF EQUIPMENT AT TERMINALS.

	System	Michigan	Passenger
Located	*$12.50	*$12.50	
Factor 2-6			*3.75

Assignment of Passenger to Services.

Passenger & Baggage	Factor 2-16	*$2.06
Sleepers	" 2-16	* .67
Diners	" 2-16	* .41
Mail & Express	" 2-16	* .61

*Credit item—Deduct.

Accounts
351 to 357 TRAFFIC EXPENSES.

		System	Michigan	Passenger
351	Superintendence	$31,297.97	$25,937.31	$11,729.60
352	Outside Agencies	37,255.42	30,855.90	17,830.04
353	Advertising	4,549.00	3,759.91	3,726.69
354	Traffic Association	345.75	287.18	
355	Fast Freight Lines	5.42	4.50	
357	Insurance	101.42	56.33	56.33
358	Stationery & Printing	12,349.62	10,238.61	3,826.04
	All above accepted in company's figures.			
357	Ind. & Immgr. Bureaus	9,456.01	8,307.92	2,850.44
	This acct. assigned on basis of Revenues, Passenger & Freight in and about Michigan.			

All assigned to Passenger & Baggage.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account 371 SUPERINTENDENCE—TRANSPORTATION.

	System	Michigan	Passenger
	$21,468.60		
Factor 9-1		$18,483.26	
Car Accts. office included above as follows:			
Factor 10 Passgr.	663.70		
Frt.	3,760.95		
$ 663.70 Factor 7-B		557.00	$ 557.00
$3,760.95 " 8		3,220.90	
Balance $14,705.36 Factor Passgr.		14,705.36	4,587.04
		Total Passenger	$ 5,144.04

Assignment of Passenger to Services.

Passenger & Baggage	Factor 9-12	$2,608.89
Sleepers	" 9-12	1,192.37
Diners	" 9-12	521.79
Mail & Express	" 9-12	611.38
Mineral Range Run	" 9-12	209.61

Account 372 DISPATCHING TRAINS.

	System	Michigan	
	$12,820.83		
To Michigan on all Train Miles, 83.1646%		$10,662.39	
The above includes light engine miles.			
1/3 time dispatching trains, Common, Factor 11-F, 47.0054%			
2/3 time distributing cars, all freight.			
We allow 1/3, however, for reciprocal time of Agent's receiving orders.			
		47.0054%	
Less 1/3		15.8192%	31.1862%
			78.1916%
One-third is			26.0639%
			Passenger
$10,622.39 X 26.0639%			$2,840.35

Assignment of Passenger to Services.

Passenger & Baggage,	Factor 17, Line 15	$1,291.25
Sleepers	" 17, " 15	740.70
Diners	" 17, " 15	396.87
Mail & Express	" 17, " 15	411.53

Details of Distribution of Operating Expenses (Continued).

Account
373 STATION EMPLOYEES.

	System	Michigan	
	$155,949.73		
Located to Michigan		$138,098.20	
Located by M. A. Co.	Freight	Passenger	Common
	$58,181.23	$10,933.36	$68.983.61
Com. divided on located	58,070.95	10,912.66	
Total Passenger		$21,846.02	

Assignment of Passenger to Services.

Passenger & Baggage	84.6732 %	$18,497.73
Sleepers	5.3268 %	1,163.69
Mail & Express	10.0000 %	2,184.60

Mail & Express percentage estimated and confirmed.

Account
374 WEIGHING & INSPECTION BUREAUS.

	System	Michigan
	$1,621.28	
To Michigan on Car Miles		$1,390.87

Had agreed to $1,346.64, but failed to change figures.

Account
375 COAL & ORE DOCKS.

	System	Michigan	
	$16,704.20		
		$16,704.20	All freight

Account
376 STATION SUPPLIES & EXPENSES.

	System	Michigan	Passenger
	$10,489.74		
On percentage of acct. 373		$ 9,288.90	
On percentage of acct. 373			$1,469.44

All assigned to Passenger & Baggage.

Accounts
377 to 389 YARD EXPENSES.

	System	Michigan	Passenger
	$107,297.22		
All located to Michigan		$107,297.22	
Michigan to Passenger 3.38% (time)			$3,579.22

Assignment of Passenger to Services.

Passenger & Baggage, Factor 18, Line 19		$1,589.89
Sleepers	" 18, " 19	1,195.10
Diners	" 18, " 19	615.63
Mail & Express	" 18, " 19	178.60

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account 390 OPERATING JOINT YARDS & TERMINALS. DR.

	System	Michigan	Passenger
	$38,694.35		
Located to Michigan		$17,080.53	
Michigan located	Freight	Passenger	Common
	$10,141.61	$ 6,936.70	$ 2.22
Com. divided on located	1.52	.70	
Total Passenger		$ 6,937.40	

Assignment of Passenger to Services.

Passenger & Baggage,	Factor	9,	Line 12	$3,667.88
Sleepers	"	9,	" 12	1,676.37
Diners	"	9,	" 12	733.59
Mail & Express	"	9,	" 12	859.56

Account 391 OPERATING JOINT YARDS & TERMINALS. CR.

	System	Michigan	
	$13,578.88		
		$13,578.88	
Michigan located	Freight	Passenger	Common
Frt. Transfer—Soo	$8,730.02		
Houghton Round House	438.35		
Soo Round House	1,403.10		$2,982.86
Other Common			4.45
Common to Passenger on basis of Engine House Expenses, 61.8876%		$1,847.48	

Assignment of Passenger to Services.

Passenger & Baggage,	Factor	9,	Line 12	$ 976.78
Sleepers	"	9,	" 12	446.43
Diners	"	9,	" 12	195.36
Mail & Express	"	9,	" 12	228.91

Credit account—Deduct all figures.

Details of Distribution of Operating Expenses (Continued).

Account
392 TRAIN ENGINEMEN.

	System		
Freight	$86,794.11		
Passenger	69,171.31		
Freight to Michigan Factor 6-3		$72,420.40	
Passenger to Michigan " 6-D		57,761.64	includes MR $3,000.31

Assignment of Passenger to Services.

Passenger & Baggage,	Factor 17,	Line 28	$24,452.04
Sleepers	" 17,	" 28	14,473.58
Diners	" 17,	" 28	7,808.14
Mail & Express	" 17,	" 28	8,027.57
Mineral Range Run			3,000.31

Account
394 FUEL FOR TRAIN LOCOMOTIVES.
Located by individual engine miles

	System		Michigan		
Freight	$163,954.60	Factor 6-F	$136.424.00		
Passenger	102,205.04	Factor 6-H	85,287.44	MRRR	$4452.15
Mixed	1,343.39	Pass. 20.70%	278.08		
Mixed		Frt. 79.30%	1,065.31		
Special	209.41	Factor 6-G	89.25	P	
Special		Factor 6-G	90.92	F	
			$223,235.00		
		Passenger (from above)			$85,654.77

Assignment of Passenger to Services.

	Factor	Passenger	Mixed	Special
Passenger & Baggage	17-28	$36,094.57	$124.17	$39.85
Sleepers	17-28	21,365.01	73.50	23.59
Diners	17-28	11,525.90	39.65	12.73
Mail & Express	17-28	11,849.81	40.76	13.08
Mineral Range Run		4,452.15		

Details of Distribution of Operating Expenses (Continued).

Account
397 WATER FOR TRAIN LOCOMOTIVES.

	System	Michigan	Passenger	
	$14,684.97			
On percent. acct. 394		$12,250.22		
On percent. acct. 394			$4,703.46 MRRR	$244.21

Assignment of Passenger to Services.

Passenger & Baggage,	Factor 17,	Line	28	$1,991.15
Sleepers	" 17,	"	28	1,178.59
Diners	" 17,	"	28	635.82
Mail & Express	" 17,	"	28	653.69
Mineral Range Run				244.21

Account
398 LUBRICANTS FOR TRAIN LOCOMOTIVES.

	System	Michigan	Passenger	
	$4,452.50			
On percent. acct. 394		$3,712.77		
On percent acct. 394			$1,424.58 MRRR	$74.05

Assignment of Passenger to Services.

Passenger & Baggage,	Factor 17,	Line	28	$ 603.04
Sleepers	" 17,	"	28	356.95
Diners	" 17,	"	28	192.56
Mail & Express	" 17,	"	28	197.98
Mineral Range Run				74.05

Account
399 OTHER SUPPLIES FOR TRAIN LOCOMOTIVES.

System
$3,202.02

Assigned to services by special analysis of M. & M. P. Department issue of supplies to individual locomotives and individual locomotive mileage.

		Factor	Mich.	Passenger	
To Michigan Freight	$2,005.04	6-I	$1,668.26		
Passenger	1,139.16	6-K	942.01	$942.01	
Mineral Range	36.13	all	36.13	36.13	
Mixed	19.48	all	19.48	4.03	2.07%
Special	2.21	6-G	1.90	.96	

ACCOUNT 398—Continued.

Assignment of Passenger to Services.

Passenger & Baggage	Factor	17-28	$422.85
Sleepers	"	17-28	250.30
Diners	"	17-28	135.03
Mail & Express	"	17-28	138.02
Mineral Range Run	"	17-28	36.13

Account		System	Michigan	Passenger
400	ENGINE HOUSE EXPENSES—TRAIN.	$44,812.41		
	Assigned to Michigan on Revenue Engine mile basis, Company's figures used 84.84%		$38,018.85	
	We used 41.7% as passenger per cent to Michigan as per agreement			$15,853.86

Assignment of Passenger to Services.

Passenger & Baggage	Factor	17-28	$7,079.07
Sleepers	"	17-28	4,190.22
Diners	"	17-28	2,260.52
Mail & Express	"	17-28	2,324.05

Account		System
401	TRAIN MEN.	
	Freight	$116,985.66
	Passenger	66,666.28

Details of Distribution of Operating Expenses (Continued).

ACCOUNT 401—Continued.

Assigned to Michigan on Train Miles.

			Michigan	Passenger	
Freight	$116,985.66				
Less Mixed	2,822.40				
	114,163.26	Factor 11-G	$94.479.80		
Pass'ger	66,666.28				
Less Mixed	774.60	Factor 11-H	54,953.00	$54,953.00	
Mixed	3,597.00	all Michigan	3,597.00	774.60	20.7%
			Total Passenger	$55,727.60	

Passenger $54,953.00 includes M. R. R. R. $2,941.01.

From analysis of Pay Rolls we find following percentages of Employees:

Conductors 53.27%, Brakemen 29.31%, Baggagemen 17.42%.

			Train Oper.	Pass. & Bag.
Conductors	28.11942	50-50	$14,059.71	$14,059.71
Brakemen			15,471.75	
Baggagemen				9,195.42
			$29,531.46	$23,255.13

Mineral Range Run		$ 2,941.01
Passenger & Baggage direct		23,255.13
Passenger & Baggage	18-11	15,945.90
Sleepers	18-11	5,950.18
Diners	18-11	3,089.96
Mail & Express	18-11	4,545.42

Account 402 TRAIN SUPPLIES AND EXPENSES.

	System	Michigan
Located to Services by Company Freight	$8,825.71	
Passenger	27,793,20	
To Michigan on Train Mile basis.		
Freight $ 8,825.71	Factor 11-A	$ 7,325.50
Passenger 27,793.20	" 11-B	23,195.64
Michigan $23,195.64 includes M. R. R. R.		1,236.01

Details of Distribution of Operating Expenses (Continued).

ACCOUNT 402—Continued.

Assignment of Passenger to Services.

Mineral Range Run			$1,236.01
Passenger & Baggage,	Factor	18-11	11,857.39
Sleepers	"	18-11	4,424.56
Diners	"	18-11	2,297.70
Mail & Express	"	18-11	3,379.98

Account
403 OPERATING SLEEPING CARS.

	System	Michigan	Passenger
	$14,272.69		
		$10,942.87	$10,942.87

We accept Company assignment to Michigan.
All assigned to Sleepers.

Account
404 SIGNAL AND INTERLOCKER OPERATION.

	System	Michigan	Passenger
	$1,240.74		
Located to Michigan (Neg. Semaphore)		$40.74	
To Passenger on time computation in 1915 of class of train, using crossing, Passenger 5.24%. 40.17x5.24%			2.13

Assignment of Passenger to Services.

Passenger & Baggage,	Factor	18-14	$1.17
Sleepers	"	18-14	.42
Diners	"	18-14	.22
Mail & Express	"	18-14	.32

Account
405 CROSSING PROTECTION.

	System	Michigan	Passenger
	$8,589.75		
Located to Michigan		$8,109.75	
Michigan to Passenger 5.24%			$424.93

The 5.24% determined by trains and time using the facilities.
Parker's figures—1915.

ACCOUNT 405—Continued.

Assignment of Passenger Services.

Passenger & Baggage, Factor		18-14	$234.21
Sleepers	"	18-14	83.76
Diners	"	18-14	43.24
Mail & Express	"	18-14	63.74

Account 407 TELEGRAPH AND TELEPHONE OPERATION.

	System	Michigan	Passenger
	$143.32		
Located to Michigan		$143.32	
Michigan to Passenger (overhead), Factor 9-B			$44.70

Assignment of Passenger to Services.

Passenger & Baggage, Factor		9-12	$23.63
Sleepers	"	9-12	10.80
Diners	"	9-12	4.73
Mail & Express	"	9-12	5.54

Account 410 STATIONERY AND PRINTING.

	System	Michigan	Passenger
	$11,331.74		
Located to Michigan, Factor 9-A		$9,755.99	
Michigan to Passenger, Factor 9-B			$3,043.19

Assignment of Passenger to Services.

Passenger & Baggage, Factor		9-12	$1,608.97
Sleepers	"	9-12	735.36
Diners	"	9-12	321.80
Mail & Express	"	9-12	377.06

Details of Distribution of Operating Expenses (Continued).

Account 411 OTHER EXPENSES—TRANSPORTATION.

	System	Michigan	Passenger
	$1,160.48		
Assigned to Michigan.			
Located Freight		$350.51	
Located Freight on coal, 22.67		22.67	$ 8.42
Located Agts. Loss Keweenaw Bay, $19.57		19.57	5.52
Common $257.83 Freight (loaded frt. cars) 86.26%		220.40	
Common $398.33, Factor 9-A		342.94	
Michigan common $342.94 to pass. Factor 9-B.			106.97
		Total Passenger	$120.91

Assignment of Passenger to Services.

Passenger & Baggage, Factor	9-12	$63.93
Sleepers	" 9-12	29.21
Diners	" 9-12	12.79
Mail & Express	" 9-12	14.98

Account 412 OPERATING JOINT TRACKS AND FACILITIES. DR.

	System	Michigan	Passenger
	$3,302.05		
Located to Michigan		$935.54	
A. Direct Passenger	118.43		$118.43
B. Direct Freight	741.41		
C. Joint Station common	73.55 acct. 273		11.64
D. Crossing Gates common	2.15 acct. 405		.11
			$130.18

Assignment of Passenger to Services.

Passenger & Baggage	$72.55
Sleepers	29.25
Diners	12.53
Mail & Express	15.85

Details of Distribution of Operating Expenses (Continued).

Account
413 OPERATING JOINT TRACKS AND TERMINALS. CR.

	System	Michigan
	*$4,998.65	
Located		*$3,549.96

	Passenger	Freight	Common
Michigan	*$787.95	*$2,697.57	*$664.45

		Passenger
Passenger Direct	A.	*$787.95
Common Water Sta. $222.18, Acct. 385-397	B.	* 78.17
" Sta. Sup. & Exp. $442.27, Acct. 273	C.	* 66.96

Assignment of Passenger to Services.

A & C on Acct. 273. B on 17-28.	
Passenger & Baggage	*$759.55
Sleepers	* 65.43
Diners	* 11.15
Mail & Express	* 96.95

*Credit figure—Deduct.

Account
414 INSURANCE.

	System	Michigan
	$2,476.09	
Location accepted		$1,374.05

	Freight	Passenger	Common
Michigan	$817,14	$67.38	$487.53
Common located		37.28	
Total Passenger		$104.66	

Assignment of Passenger to Services.

Passenger & Baggage, Act.	273	$88.64
Sleepers	" 273	5.57
Mail & Express	" 273	10.45

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

28

Account
416 DAMAGE TO PROPERTY.

		System	Michigan	Passenger
		$4,926.91		
Located			$4,065.01	
	Freight	Common		
Located	$3,674.61	$390.40		
Common in 6 M				$191.43

Assignment of Passenger to Services.

Passenger & Baggage	9-12	$101.21
Sleepers	9-12	46.26
Diners	9-12	20.24
Mail & Express	9-12	23.72

Account
417 DAMAGE TO STOCK ON RIGHT OF WAY.

		System	Michigan	Passenger
		$1,511.36	$808.86	
	Passenger	Freight	Common	
Michigan located	$690.91	$72.10	$45.85	
Common on "	41.52			
	$732.43			$732.43

Assignment of Passenger to Services.

Passenger & Baggage, Factor	18-14	$403.67
Sleepers	" 18-14	144.37
Diners	" 18-14	74.53
Mail & Express	" 18-14	109.86

Account
419 LOSS AND DAMAGE TO BAGGAGE.

	System	Michigan	Passenger
	$282.37	$198.37	$198.37

All Passenger and Baggage.

Details of Distribution of Operating Expenses (Continued).

Account					
420	INJURIES TO PERSONS.				
			System	Michigan	Passenger
	Located		$23,479.85	$20,835.75	
		Freight	Common		
	Located	$17,002.79	$257.01		$3,575.95
	Common on located				44.66
				Total Passenger	$3,620.61

Assignment of Passenger to Services.

Passenger & Baggage	9-12	$1,914.26
Sleepers	9-12	874.89
Diners	9-12	382.86
Mail & Express	9-12	448.60

Account				
441	DINING AND BUFFET SERVICE.			
		System	Michigan	Passenger
		$45,006.24		
	On earnings		$36,477.56	$37,477.56
	All Diners.			

Details of Distribution of Operating Expenses (Continued).

VII. GENERAL EXPENSES.

		System		Michigan
451		$25,572.61	Factor 12-6	$21,159.03
452		37,231.75	" 12-6	30,805.92
453		3,428.61	" 12-6	2,836.67
454A	Cost 2c Suit	28,884.15	All	28,884.15
454B	Other Law Exps.	10,140.74	Factor 12-6	8,390.55
455		144.78	" 12-6	119.79
457		720.00	" 12-6	595.74
458		4,911.73	" 12-6	4,061.01
459		5,304.08	Road Miles	4,388.65
461		451.20	Located	112.20
460	Other General Expenses.			

Common	Wisconsin	Michigan	
$3,629.22	$33.46	$1,414.45	
3,629.22	Factor 12-6	3,002.85	4,417.30

	Assigned to Passenger.			Passenger
451	Factor 12-13			$ 6,789.49
452	" 12-13			9,884.97
453	" 12-13			910.23
454A	Omitted for purpose of this suit			.....
454B	Factor 12-13			2,692.35
455	" 12-13			38.43
457	" 12-13			191.16
458	" 12-13			1,304.06
459	" 12-13			1,408.23
461	" 12-13			51.12
460	Located freight	$25.58		
	" Passenger		$ 16.00	
	" Common, Factor 12-13		1,404.08	1,420.08
				$24,690.12

Assignment of All Above Accounts to Services.

Passenger & Baggage, Factor 12-18		$12,668.26
Sleepers	" 12-18	5,069.03
Diners	" 12-18	4,039.72
Mail & Express	" 12-18	2,913.11

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. Year ending June 30th, 1915.

	a System.	b Total Michigan.	c Michigan Passenger.	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
1 MAINTENANCE OF WAY & STRUCTURES.								
201. Superintendence	$ 22,330.89	$ 17,374.75	$ 5,187.46		$ 2,393.29	$ 1,333.45	$ 712.25	$ 748.47
202. Roadway Maintenance	47,209.21							
a. Care of Roadbed		3,876.45						
b. General Cleaning.		11,439.24						
c. Watching Roadway.		20,851.60						
d. Bank Protection		393.10						
e. Train Service		2,579.63						
f. Track Changes		66.20						
g. Other Expenses		64.10						
Total roadway maintenance		39,269.32	20,074.79		9,126.18	5,235.08	2,804.95	2,908.58
208. Bridges, Trestles and culverts	86,935.57	89,367.63	12,060.23		5,491.78	3,150.27	1,687.91	1,750.27
212. Ties	95,351.57	79,392.98	21,166.25		9,632.37	5,519.71	2,957.45	3,066.72
214. Rails	20,682.25	19,782.04	5,273.91		2,397.57	1,375.32	736.90	764.12
216. Other Track Material	23,469.14	21,806.42	5,813.61		2,643.92	1,516.07	812.31	842.31
218 Ballast	10,362.04	9,703.48	2,586.96		1,176.06	674.43	361.46	374.83
220. Track Laying & surfacing	178,066.55							
a. Applying Ballast		7,516.61						
b. Applying Ties		38,550.52						
c. Applying Rails		5,597.93						
d. Applying Other Track Material		1,330.78						
e. Track Maintenance		38,487.25						
f. Train Service		3,288.45						

Duluth South Shore & Atlantic Railway Company.

Details of Distribution of Operating Expenses (Continued).

	a System.	b Total Michigan.	c Michigan Passenger.	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
g. Track Changes		195.80						
h. Other expenses		81.29						
Total Track Laying and Surfacing		$145,548.03	38,803.25		17,640.31	10,119.07	5,421.78	5,622.09
221. Right of Way Fences	5,616.46	3,309.43	1,475.51		670.78	384.78	206.17	213.78
222. Snow, Sand Fences & Snow Sheds	244.46	199.11	89.21		40.56	23.26	12.46	12.93
226. Crossings & Signs	1,656.27	1,308.65	527.37		239.75	137.53	73.68	76.41
227. Station & Office Buildings	7,088.60							
a. Station Buildings and Grounds		5,373.82	1,924.00		1,629.02	102.58		192.40
b. Office Buildings and Grounds		103.18	33.10		16.98	6.80	5.42	3.90
c. Track Scales		931.33						
229. Roadway Buildings	1,933.47	1,192.95	357.90		165.12	92.00	49.14	51.64
231. Water Stations	5,065.25	4,279.21	1,507.28		673.03	398.38	214.91	220.96
233. Fuel Stations	2,581.35	2,134.34	734.50		327.97	194.13	104.73	107.67
235. Shops & Engine Houses	3,519.12							
a. Shops		1,124.61	342.09		186.78	61.39	37.83	56.08
b. Engine Houses		1,934.75	617.03		277.16	163.09	87.28	90.50
241. Wharves and Docks	884.16							
a. St. Ignace Merchandise Dock		46.72						
b. St. Ignace Slip Dock		837.44	190.45		102.80	42.51	20.51	24.63
243. Coal & Ore Docks	2,090.83							
a. Marquette Ore Dock		2,090.83						
244. Coal & Ore docks—Depreciation (all ore)	19,145.88	19,145.88						

	a System.	b Total Michigan.	c Michigan Passenger.	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
247. Telegraph and Telephone Lines	$ 2,857.26	$ 2,538.58	$ 799.73		396.44	185.75	98.24	119.30
249. Signals & Interlockers	491.57	197.70	10.36		4.82	2.72	1.40	1.42
267. Paving	7.70	7.70	2.30		1.07	.60	.31	.32
269. Roadway Machines	845.24	657.65	197.31		91.03	50.73	27.09	28.47
271. Small Tools & Supplies	7,954.45	6,189.11	2,456.86		1,133.50	631.54	337.33	354.49
272. Removing snow, sand & ice	21,306.42	20,060.23	6,748.68		3,069.92	1,757.60	941.51	979.65
273 Assessment for Public Imments	232.72	99.45	44.56		20.56	11.45	6.12	6.43
274. Injuries to Persons	2,825.99	1,809.93	535.51		247.06	137.65	73.53	77.27
275. Insurance	4,532.26	3,927.23	784.36		410.81	175.69	90.30	107.56
276. Stationery & Printing	713.09	554.83	165.65		76.43	42.58	22.74	23.90
277. Other Expenses	104.81	82.35	24.59		11.34	6.32	3.38	3.55
278. Maint. Jt. Tks. Yds. and Other Facil., Dr.	8,505.28	6,097.54	637.46		341.67	130.21	67.74	97.84
279. Maint. Jt. Tks. Yds. and Other Facil., Cr.	*13,631.52	*13,631.52	*6,004.92		* 2,973.05	* 1,436.28	* 815.60	* 779.99
Total Maintenance of ways & Structures	$570,978.34	$444,893.44	$125,187.35		57,652.03	32,225.59	17,161.23	18,148.50
* Deduct.								
II. MAINTENANCE OF EQUIPMENT.								
301. Superintendence	12,519.96	10,619.52	3,230.34	140.61	1,686.91	554.50	341.71	506.61
302. Shop Machinery	6,693.95	5,677.86	1,727.14		942.98	309.96	191.01	283.19
308. Steam Locos.—Repairs	93,458.09							
a. Freight		35,084.42						
b. Passenger		33,342.11	33,342.11	1,290.07	14,311.88	8,471.45	4,570.14	4,698.57
c. Switch		11,317.95	382.55		169.93	127.73	65.80	19.09
309. Steam Locomotives—Depreciation	23,944.92							
a. Freight		10,661.55						
b. Passenger		5,926.63	5,926.63	292.70	2,515.66	1,489.06	803.32	825.89
c. Switch		4,054.35	137.04		60.87	45.76	23.57	6.84

Duluth South Shore & Atlantic Railway Company.

Details of Distribution of Operating Expenses (Continued).

	a System.	b Total Michigan.	c Michigan Passenger.	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
310. Steam Locomotives—Retirements	* 223.01							
a. Freight		* 222.39						
b. Passenger		* .50	* .80		* .36	.31	.11	.12
c. Switch		46.33	1.57		.70	.52	.27	.08
314. Freight Train Cars—Repairs	146,912.18	125,815.59						
315. Freight Train Cars—Depreciation	62,765.78	53,752.61						
316. Freight Train Cars—Retirements	2,151.16	1,842.35						
317. Passenger Train Cars—Repairs	50,302.52	41,409.26	41,409.26	2,021.66	24,852.36	4,182.44	3,266.66	7.084.24
318. Passenger Train Cars—Depreciation	12,366.74	10,128.24	10,128.24	358.10	4,402.18	2,057.28	2,055.22	1,354.86
326. Work Equipment—Repairs.	5,734.54	4,445.48	1,323.72		606.91	247.48	186.15	193.27
327. Work Equipment—Depreciation	3,497.66	2,711.42	813.47		370.17	211.91	113.51	117.88
328. Work Equipment—Retirements	319.82	247.87	74.29		33.85	19.28	10.38	10.76
332. Injuries to Persons	2,830.70	2,412.91	418.43		238.45	75.00	46.26	58.61
333. Insurance	1,788.80							
a. Freight engines & cars		614.46						
b. Passenger cars		271.45	271.45	8.98	111.92	58.88	59.77	31.90
c. Passenger engines		59.58	59.58					
d. Switch engines		14.20	.50		36.68	15.68	8.57	6.80
f. Shops		508.48	154.73		84.48	37.77	17.11	15.37
e. Work equipment		40.98	12.29		5.59	3.21	1.71	1.78

* Deduct credit.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. Year ending June 30th, 1915.

	a System.	b Total Michigan.	c Michigan Passenger.	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
334. Stationery & Printing	1,101.23	934.39	256.67		140.13	46.06	22.39	42.69
336. Maint. Jt. Equip. at Terminals, Dr.	604.98							
337. Maint. Jt. Equip. at Terminals, Cr.	• 12.50	• 12.50	• 3.75		• 2.06	• .67	• .41	• .61
Total Maintenance of Equipment	$426,747.58	$361,695.31	$ 99,675.76	4,112.12	50,549.38	18,044.03	11,791.11	15,179.12
III. TRAFFIC EXPENSES.								
351. Superintendence	31,297.97	25,937.91	11,729.60		11,729.60			
352. Outside Agencies.	37,255.42	30,855.90	17,830.04		17,830.04			
353. Advertising	4,549.00	3,759.91	3,726.69		3,726.69			
354. Traffic Associations	345.75	287.18						
355. Fast Freight Lines	5.42	4.50						
356. Industrial & Immigration Bureaus	9,456.01	8,307.92	2,850.44		2,850.44			
357. Insurance	101.42	56.33	56.33		56.33			
358. Stationery & Printing.....	12,349.62	10,238.61	3,826.04		3,826.04			
Total Traffic Expenses....$	95,360.61	$ 79,448.26	$ 40,019.14		40,019.14			
IV. TRANSPORTATION EXPENSES.								
371. Superintendence	$ 21,468.60	$ 15,483.26	$ 5,144.04	209.61	2,608.89	1,192.37	521.79	611.38
372. Dispatching Trains	12,820.83	10,662.39	2,840.35		1,291.25	740.70	396.87	411.53
373. Station Employees	155,949.73	138,098.20	21,846.02		18,497.73	1,163.69		2,184.60
374. Weighing, Inspecting & Demurrage Bureaus.	1,621.28	1,390.87						
375. Coal & Ore Dock	16,704.20	16,704.20						
376. Station Supplies & Expenses	10,489.74	9,288.98	1,469.44		1,469.44			
377. Yardmasters & Yard Clerks	4,705.05	4,705.05	159.03					
378. Yard Conductors & Brakemen	37,207.00	37,207.00	1,257.60					

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

	a System.	b Total Michigan.	c Michigan Passenger.	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
379. Yard Switch and Signal Tenders	3,991.70	3,991.70	134.92					
380. Yard Enginemen	23,842.09	23,842.09	805.86					
382. Fuel for Yard Locomotives	21,417.29	21,417.29	723.90					
385. Water for Yard Locomotives	1,213.26	1,213.26	41.01					
386. Lubricants for Yard Locomotives	337.90	337.90	11.42					
387. Other Supplies for Yard Locomotives	380.32	380.32	12.86					
388. Engine House Expenses—Yard	12,912.41	12,912.41	389.01					
389. Yard Supplies & Expenses.	1,290.19	1,290.19	43.61					
Total Yard Expenses, 377-389			3,579.22		1,589.89	1,195.10	615.63	178.60
390. Operating Jt. Yds. & Terminals, Dr.	38,694.35	17,080.53	6,937.40		3,667.88	1,676.37	733.59	859.56
391. Operating Jt. Yds. & Terminals, Cr.	*13,578.88	* 13,578.88	* 1,847.48		* 976.78	* 446.42	* 195.36	* 228.91
392. Train Enginemen	155,965.42	130,182.04	57,761.64	3,000.31	24,452.04	14,473.58	7,806.14	8,027.57
394. Fuel for Train Locomotives	267,712.44							
a. Freight		136,424.00						
b. Passenger		85,287.44	85,287.44	4,452.15	36,094.57	21,365.01	11,525.90	11,849.81
c. Mixed		1,343.39	278.08		124.17	73.50	39.65	40.76
d. Special		180.17	89.25		39.85	23.59	12.73	13.08
397. Water for Train Locomotives	14,694.87	12,350.23	4,703.46	244.21	1,991.15	1,178.59	635.82	653.69
398. Lubricants for Train Locomotives	4,452.50	3,712.77	1,424.58	74.05	603.04	356.95	192.58	197.93
399. Other Supplies for Train Locomotives	3,202.02	2,667.78	983.13	36.13	422.85	250.30	135.03	138.82

* Deduct credit.

THIS PAG

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. Year ending June 30th, 1915.

	a System.	b Total Michigan,	c Michigan Passenger,	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
400. Engine House Expenses—Train	$ 44,812.41	$ 38,018.85	$ 15,853.86	$	$ 7,079.07	$ 4,190.22	$ 2,260.52	$ 2,324.05
401. Trainmen	183,651.94	153,029.80	55,727.60	2,941.01	39,201.03	5,950.18	3,089.96	4,545.42
402. Train Supplies & Expenses	36,618.91	30,521.13	23,195.64	1,236.01	11,857.39	4,424.56	2,297.70	3,379.98
403. Operating Sleeping Cars	14,272.69	10,942.87	10,942.87			10,942.87		
404 Signal & Interlocker Operation	1,240.74	40.74	2.13		1.17	.42	.22	.32
405. Crossing Protection	8,589.75	8,109.75	424.95		234.21	83.76	43.24	63.74
407. Telegraph & Telephone Operations	143.32	143.32	44.70		23.63	10.80	4.73	5.54
410. Stationery & Printing	11,331.74	9,755.99	3,043.19		1,608.97	735.36	321.80	377.06
411. Other Expenses	1,160.48	958.09	120.91		63.93	29.21	12.79	14.98
412. Operating Jt. Tks. & Facilities, Dr.	3,302.05	935.54	130.18		72.55	29.25	12.53	15.85
413. Operating Jt. Tks. & Facilities, Cr.	* 4,998.65	* 3,549.96	* 933.08		* 759.55	* 65.43	* 11.15	* 96.95
414. Insurance	2,476.09	1,374.05	104.66		88.64	5.57		10.45
415. Clearing Wrecks	1,287.20	1,281.35						
416. Damage to Property	4,926.91	4,065.01	191.43		101.21	46.26	20.24	23.72
417. Damage to Live Stock on Right of Way	1,511.36	808.86	732.43		403.67	144.37	74.53	109.86
418. Loss & Damage—Freight	10,291.68	9,010.39						
419. Loss & Damage—Baggage	282.34	198.37	198.37		198.37			
420. Injuries to Persons	23,479.85	20,835.75	3,620.61		1,914.26	874.89	382.86	448.60
Total Transportation Exp	1,141,875.13	863,954.48	303,897.02	12,193.48	153,964.52	70,645.61	30,932.32	36,161.09

*Deduct.

Duluth South Shore & Atlantic Railway Company.

Details of Distribution of Operating Expenses (Continued).

	a System.	b Total Michigan.	c Michigan Passenger.	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
VI. MISCELLANEOUS OPERATIONS.								
441. Dining & Buffet Service	45,006.24	36,477.56	36,477.56				$ 36,477.56	
Total Miscellaneous Operations	45,006.24	36,477.56	36,477.56				36,477.56	
VII. GENERAL EXPENSES.								
451. Salaries & Expenses, General Officers	25,572.61	21,159.03	6,789.49					
452. Salaries & Expenses, Clerks & Attendants	37,221.75	30,805.92	9,884.97					
453. General Office Supplies & Expenses	3,428.61	2,836.67	910.23					
454. Law Expenses	39,084.89							
a. Cost of Suit		28,884.15						
b. Other Law Expenses		8,390.55	2,692.35					
455. Insurance	144.78	119.79	38.43					
457. Pensions	720.00	595.74	191.16					
458. Stationery & Printing	4,912.78	4,064.01	1,304.06					
459. Valuation Expenses	5,204.02	4,288.65	1,408.28					
460. Other Expenses	5,077.13	4,417.30	1,420.08					
461. General Joint Facilities, Dr.	451.36	112.20	51.12					
Total General Expenses	121,866.78	105,774.01	24,690.12		12,668.26	5,069.03	4,039.72	2,912.11
Total Operating Expenses	2,401,234.68	1,962,243.06	829,946.95	16,305.80	314,853.23	125,984.28	100,401.94	72,401.32

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Expenses. Year ending June 30th, 1915.

	System	Total Michigan	Michigan Passenger	Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
Grand Total OPERATING EXPENSES	$2,401,834.68	$1,992,243.06	$629,946.95	$ 16,305.60	$314,853.33	$125,984.26	$100,401.94	$ 73,401.83
Deduct account use of Factor 11-C instead Factor 16-B on acct. 202			6,133.47		2,788.33	1,599.48	857.00	888.66
Deduct account reduction above will make in Account 201			215.62		98.03	56.22	30.13	31.24
Corrected operating figures	$2,401,834.68	$1,992,243.06	$623,557.86	$ 16,305.60	$311,966.97	$124,328.56	$ 99,514.81	$ 71,481.93
The above reduction would affect MAINTENANCE OF WAY & STRUCTURES total as follows,	$570,978.34	$444,893.44	$125,187.35		$ 57,652.03	$ 33,325.59	$ 17,161.23	$ 15,148.50
Deductions			6,349.09		2,886.36	1,655.70	887.13	919.90
Corrected figures MAINTENANCE OF WAY & STRUCTURES	$570,978.34	$444,893.44	$118,838.26	$	$ 54,765.67	$ 30,569.89	$ 16,274.10	$ 17,228.60

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Assignment of Passenger and Baggage Expenses to INTER and INTRA.
Year ending June 30th, 1915.

	Total Passenger & Baggage.		Inter	Intra
I MAINTENANCE OF WAY & STRUCTURES	$ 54,765.67			
Account 227-A, Station Buildings	1,629.02	on Intra Factor 1	$ 209.78	$ 1,419.24
Overhead Accounts—201, 229, 267, 275 (in part), 276, 277, 278 and 279	25.23	" " " 3	7.37	17.86
All other accounts	53,111.42	" " " 2	15,778.55	37,332.87
II MAINTENANCE OF EQUIPMENT	50,549.38	on Intra Factor 2	15,017.41	35,531.97
III TRAFFIC EXPENSES	40,019.14			
Account 352, Outside Agencies	17,830.04	on Intra Factor 4-A	16,408.99	1,421.05
Accounts 353, Advertising	3,726.69	" " " 4-B	2,573.65	1,153.04
Accounts 356-358	6,732.81	" " " 2	2,000.21	4,732.60
Account 351	11,729.60	" " " 5	8,700.06	3,029.54
IV TRANSPORTATION EXPENSES	153,964.52			
Accounts 373 and 376, Stations	19,967.17	on Intra Factor 1	2,571.33	17,395.84
Overhead accounts, 371, 390, 391, 407, 410, 411, 412 and 413	6,309.52	" " " 6	1,730.88	4,578.64
All other accounts	127,687.83	" " " 2	37,934.01	89,753.82
VII GENERAL EXPENSES	12,668.26	on Intra Factor 7	4,356.75	8,311.51
			106,288.99	204,677.98
Deduct expenses located to Inter from Intra and add to Inter. Acct. 278, Soo Bridge Eng. House	64.69	Factor 13—11	35.65	* 35.65
Acct. 412, Soo Bridge	113.43	A-11	113.43	* 113.43
			$106,442.07	$204,523.90

*Deduct.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Earnings. Year ending June 30th, 1915.

	System	MICHIGAN							
		Total	Freight	Mineral Range	PASSENGER				
					Total	Sleepers & Diners	Mail & Express	Passenger & Baggage Total	Interstate	Intrastate
101. Freight	$1,813,059.09	$1,603,110.01	$1,603,110.01							
102. Passenger	857,607.38	746,871.81			$746,871.81			$746,871.81	$216,323.50	$530,048.31
103. Excess Baggage	7,894.74	7,291.18			7,291.18			7,291.18	2,864.25	4,426.93
104. Sleeping Cars	36,032.96	27,734.06			27,734.06	27,734.06				
105. Par. & Chair Cars	4,022.30	4,022.30			4,022.30	4,022.30				
106. Mail	67,499.13	54,520.73			54,520.73		54,520.73			
107. Express	29,502.05	26,863.10			26,863.10		26,863.10			
108. Other Pass. Trains	2,045.34	1,766.97			386.97			386.97	88.72	298.25
" " "				$186.00	1,194.00	S 223.40	132.62	713.65	207.17	506.48
" " "						D 118.23				
109. Milk	491.11	129.00			129.00			129.00		129.00
110. Switching	19,620.93	10,134.21	10,134.21							
111. Spl. Service Train	2,951.50	2,657.97	1,624.65		1,033.32			1,033.32	278.51	754.81
112. Other Freight Train	6.90	6.90	6.90							
131. Dining & Buffet	35,838.55	28,283.90			28,283.90	28,283.90				
133. Sta. & Train Priv.	600.00	495.47			495.47			495.47	143.83	351.64
134. Parcel Room	449.00	449.00			449.00			449.00	130.34	318.66
135. Storage—Freight	1,743.60	1,682.35	1,682.35							
136. Storage—Baggage	86.90	86.90			86.90			86.90	25.23	61.67
137. Demurrage	3,285.60	3,017.30	3,017.30							
138. Telgh. & Telph.	636.85	620.56	401.81		218.75			218.75	63.50	155.25
142. Rents of Bldgs.	7,757.00	7,557.50	6,810.86		746.64			746.64	216.75	529.89
143. Miscellaneous	39,698.48	39,488.35	38,138.71		1,349.64			1,349.64	391.80	957.84
151. Joint Facilities Cr.	6,521.08	2,318.00	1,167.58		1,150.42			1,150.42	426.73	723.69
152. Joint Facilities Dr.	* 12.50	* 12.50			* 12.50			* 12.50	* 2.63	* 8.87
	$2,937,437.99	$2,569,095.07	$1,666,094.38	$186.00	$902,814.69	$60,381.99	$81,522.45	$760,910.25	$221,656.70	$539,253.55

*Deduct.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Income Account down to Net Returns applicable to return on Investment. Passenger business State of Michigan. Year ending June 30th, 1915.

Item number and description	Mineral Range Run	Total D.S.S.& A. Passenger	D.S.S.& A. Passenger				Passenger & Baggage	
			Sleepers	Diners	Mail & Express	Passenger & Baggage	Interstate	Intrastate
1. Earnings	$ 186.00	$902,814.69	$ 31,979.76	$ 28,402.22	$ 81,522.45	$760,910.26	$221,656.70	$539,253.56
2. Expenses	16,305.60	607,292.36	124,328.56	99,514.81	71,481.92	311,966.97	107,442.07	204,523.90
3. Net to Income	*16,119.60	295,522.43	* 92,348.80	* 71,112.53	10,040.53	448,943.29	114,213.63	334,729.65
4. Track Rent Ishpeming to Marquette, C.&N.W.Ry. ‡		1,047.17	195.93	103.77	121.53	625.89	181.70	444.19
5. Track Rent, Negaunee to Calumet, C.& N.W.Ry ‡	957.12	5,571.79	1,042.48.	552.16	646.82	3,330.27	966.78	2,363.49
6. Champion to Calumet C. M. & St. P. Ry. ‡.	521.35	2,550.00	447.10	253.70	296.05	1,524.15	442.46	1,081.69
7. C. & N.W.Ry. freights, Michigamme to Beaufort, Common $2,816.95								
8. Houghton to Pilgrim. 4,135.20								
9. Baraga to Zenith Jct. 775.00								
10. Union Depot Tracks, Negaunee 57.00								
Total Track $8,784.15‡‡								
Pass Factor 1-10, Services Factor 17-23		2,635.29	696.54	375.77	386.33	1,176.75	341.61	835.14
11. Rent, Pass. Depot, Negaunee. .		150.00				150.00	43.54	106.46
	*14,641.23	307,476.78	* 89,936.75	* 69,828.18	11,491.37	455,750.34	116,189.72	339,560.62

Duluth South Shore & Atlantic Railway Company.

Income Account down to Net Returns applicable to return on Investment. Passenger business State of Michigan. Year ending June 30th, 1915 (Continued).

Item Number and Description	Mineral Range Run	Total D. S. S. & A. Passenger	D. S. S. & A. Ry. Passenger				Passenger & Baggage	
			Sleepers	Diners	Mail & Express	Passenger & Baggage	Interstate	Intrastate
12. Hire Equipment, Loco's‡‡		1,483.07	391.98	211.46	217.41	662.22	192.24	469.98
13. Passenger Train Cars‡‡‡		• 226.19	• 42.94	• 22.17	• 35.19	• 125.89	• 36.55	• 89.34
14. Sleepers .		• 1,299.34	• 1,299.34					
15. Work Equipment Factor 1-10 and 1-17		243.69	63.49	34.00	35.31	110.89	32.19	78.70
		307,678.01	• 90,822.56	• 69,604.89	11,708.90	456,297.56	116,377.60	340,019.96
16. Taxes direct to services		• 115.42	• 77.34	• 38.08				
17. Taxes, State of Michigan‡‡‡‡ $177,626.97	• 1,489.24	• 56,954.58	• 11,355.21	• 9,088.93	• 6,528.59	• 28,492.61	• 9,812.99	• 18,679.62
• Deduct	• 16,130.47	250,608.01	•102,256.11	• 78,731.90	5,180.31	427,904.95	106,564.61	321,340.34

N. B. The above distribution of Taxes is on the expense basis.
Also Income on investments and interest amounting to $3,972.00 is left open for adjudication for the same reasons as in 1914.

‡To services one-half each on accounts 392 and 401. Intra on earnings.
‡‡To services Factor 17-28, Intra on earnings.
‡‡‡To services Factor 12-18, Intra on earnings.
‡‡‡‡To services Factor 12-18, Intra on earnings.
‡‡‡‡To Passenger Factor 12-12.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Percentages of Maintenance of Way & Structures Accounts.
Less Account 244—Depreciation.

		Michigan	
Accounts 202 to 225	$396,200.31	82.5468%	1
241 to 267 and 272	479,970.35		
All accounts except 201,			
227-B, 265, 271, 276, 277,	441,578.23	83.2058%	6
278 and 279	530,705.80		
	Michigan—Passenger.		
Accounts 202 to 225,	105,920.05	26.7340%	10
241 to 267 and 272	396,200.31		
Accounts 202 to 249	117,636.91	27.0079%	12
and 272	435,564.20		
Accounts 202 to 225, 247 to 267 and 272			
Passenger & Baggage	$49,246.74	46.1726%	
Sleepers	27,439.20	25.7264%	17
Diners	14,547.49	13.6394%	
Mail and Express	15,424.43	14.4616%	18
Accounts 202 to 272 less 227-B, 229, 265, 269 and 271.			
Passenger & Baggage	$54,490.63	46.5996%	
Sleepers	29,816.90	25.4990%	
Diners	15,765.98	13.4828%	
Mail & Express	16,860.20	14.4186%	20

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Percentages in Maintenance of Equipment Accounts

		Michigan	
	$250,542.97	84.9515%	1
Accounts 308, 314, 317, 328	294,924,78		
	339,861.54	85.0254%	3
Accounts 308 to 328	399,710.78		
	Michigan	Passenger	
	70,073.69	27.9687%	6
Accounts 308, 314, 317, 328	250,542.97		
	86,787.22	25.5336%	9
Accounts 308 to 328	339,861.54		
	Passenger	Mineral Range	
Accounts 308 to 328	3,760.51	4.3330%	11
	86,717.22		
Accounts 308, 317, 326			
Passenger & Baggage	$36,354.84	54.5870%	
Sleepers	12,011.08	18.0347%	
Diners	7,526.94	11.3018%	
Mail & Express	10,706.88	16.0765%	16

Factor 3

1916

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Percentages of Revenue Accounts 101 & 102.

	System			
101	$2,316,447.79	69.7698%	Freight	
102	1,003,686.29	30.2302%	Pass.	1

	System	Michigan		
101	2,316,447.79	2,067,558.74	89.2556%	3
102	1,003,686.29	865,295.04	86.2091%	5

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Factors for assignment of Engine House Repairs.

Account 388	$15,813.64	$15,488.82	Switch	28.2543%	1
Account 400	45,258.80	39,328.78			2
	61,072.44	54,817.60		89.7583	3
Account 400	39,328.78	16,534.55		30.1630	5

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

A.—Fuel Accounts in Transportation Expenses

B.—Water Accounts in Transportation Expenses.
Accounts 382 & 394

		System	Michigan	
A.	Account 382	$ 28,288.85	$ 28,288.85	
	Account 394	301,342.42	251,259.52	
		329.631.27	279,548.37	84.8064%
B.	Account 385	1,821.03	1,730.61	
	Account 397	14,353.67	11,968.10	
		16,174.70	13,698.71	84.6922%
		Michigan	Passenger	
C.	Account 385	1,730.61	49.81	
	Account 397	11,968,10	4,122.19	
		13,698.71	4,172.00	30.4554%
D.	Account 382	28,288.85	716.43	
	Account 394	251,259.52	86,541.76	
		279,548.37	87,258.19	31.2140%

Duluth South Shore & Atlantic Railway Company.

Engine Miles—Road.

	—System—			—Michigan—			
	Total	Freight	Passenger	Total	Freight	Passenger	
Freight	972,227	972,227		809,240	809,240		1
Pass'r	935,536		935,536	772,466		772,466	2
Mixed	16,920	14,228	2,692	16,920	14,228	2,692	3
Special Pass.	876		876	686		686	4
" Mixed	1,717	1,280	237	1,394	1,172	222	5
Road Swi.	147,944	144,842	2,202	122,977	120,775	2,202	6
M. Range	43,183		43,183	43,183		43,183	7
	2,177,561	1,132,577	984,326	1,766,985	945,415	821,450	8
						46.4920%	9

6—A All road loco miles to Michigan
1,766,985 81.1419%
2,177,561

6—B All Pass. Rd. loco. miles to Michigan
821,450 46.4920%
1,766,985

6—C All freight loco miles to Michigan
945,415 83.467 %
1,132,577

6—D All Pass. loco miles to Michigan
821,450 83.4108%
984,326

6—E Pass. train loco miles to Michigan
772,466 83.5894%
935,536

6—F Freight Rd. & Rd. Swi. miles to Michigan
930,616 83.3549%
1,117,560

6—G Special loco miles to Mich.
2,080 80.3317%
2,589

6—H Pass. Road & Rd. Swi.
817,250 83.3758%
980,330

6—I Freight exclud. Rd. Swi.
809,240 83.2357%
972,227

6—K Pass. including Rd. Swi.
774,668 82.6103%
937,738

6—L Special train miles.
686 32.9808%
222 10.6731%
2,080

6—M Freight excluding mixed.
931,127 83.2367%
1,118,449

1—18.91 Passenger based on car miles 1916.
2—Includes 87,121 miles light locomotives Freight.
Includes 13,877 miles light locomotives Passenger.

6—N. Pass.
M. R. 43,182 4.3968
775,576 78.9685
982,150

Factor 7

1916

Duluth South Shore & Atlantic Railway Company.

Passenger Car Miles.
Does not include D. S. S. & A. Ry. Sleepers.

	—System— Pass. Coaches	Other Coaches	—Michigan— Pass. Coaches	Other Pass. Cars	
D. S. S. & A. coaches	1,819,717		1,483,341		1
Mail, Express, Bagg.		866,314		694,459	2
Foreign Diners		76,042		76,042	3
D. S. S. & A. Diners		351,097		295,292	4
C&NW and CM&StP cars in DSS&ARy trains	213,335	150,907	213,335	150,907	5
	2,033,052	1,444,360	1,696,676	1,216,700	6
DSS&A cars on Mineral Range R. R.	62,320	59,030	62,320	59,030	7
	2,095,372	1,503,390	1,758,996	1,275,730	8
Foreign Sleepers, Diners & Obvs. cars		213,649		212,619	9
DSS&ARy Sleepers		689,175		516,333	10
Pass. cars on C&NW and CM&StP trains	66,985	33,492	66,985	33,492	11
Do. Sleepers		4,380		4,380	
	2,162,357	2,444,086	1,825,981	2,042,554	12
Mineral Range cars paid for *Deduct	*5,705		*5,705		13

		To Michigan		
7-A.	Cars on which D. S. S. & A. Ry. made repairs.			
	Lines 1, 2, 7, 13	121,350	Mineral Range	4.3313%
		2,177,800		77.7321%
		2,801,676		
	Diners			
7-B.	Line 4			
7-C.	Lines 1 to 10 less 13			
		3,757,973	Mineral Range	2.5722%
		4,495,881		83.5881%

Factor 8

1916

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Freight Car Miles.

	System		Michigan		
Loaded cars	12,583,398	DSS&ARy	3,538,733		
" "		Foreign	7,160,921		
Empty cars	5,977,676	DSS&ARy	2,323,644		
" "		Foreign	2,960,679		
Mixed train loaded	112,044 M&S	DSS&ARy	37,413 Loaded		
" " empty	96,233 "	Foreign	83,743 "		
Special loaded	11,014 "	DSS&ARy	39,610 Empty		
		" Foreign	56,623 "		
	18,780,365		16,201,366		
Caboose cars	889,474		730,473		
" " Special	945		729		
	19,670,784		16,932,568	86.0798%	12
	890,419 Less caboose		731,202		
	18,780,365		16,201,366	86.2676%	14

Factor 9

1916

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

All accounts block IV, Transportation,
Except 371, 390, 391, 407, 410, 411, 412, 413 and 414.

A.	Michigan	$1,012,022.24	86.0997%	Michigan	1
	System	1,175,408.07			
B.	Passenger	$ 290.050.05	28.6604%	Passenger	3
	Michigan	1,012,022.24			
C.	Mineral Range	$ 12,093.28	4.1694%	Mineral Range	5
	Michigan	290,050.05			

To services passenger.

All accounts excepting 371, 390, 391, 407, 410, 414, 415 and 420.

Passenger & Baggage	$146,713.92	53.2911%
Sleepers	66,058.76	23.9946%
Diners	28,547.12	10.3692%
Mail & Express	33,986.81	12.3451%
	$275,306.61	

Factor 10

Car Accountant's Office.

System		$4,520.65
Passenger	15%	678.10
Freight	85%	3,842.55

1916

Duluth South Shore & Atlantic Railway Company.

Train Miles.

	—System—						
Road	1,819,085	911,473	907,612	1,500,269	752,234	748,045	1
Mixed	16,920	14,228	2,692	16,920	14,228	2,692	2
Special	761		761	622		622	3
" Mixed	1,562	1,267	315	1,260	1,060	200	4
	1,838,348	926,968	911,380	1,519,171	767,612	751,559	5
Road Swi.	147,044	144,842	2,202	122,977	120,775	2,202	6
	1,985,392	1,071,810	913,582	1,642,148	888,387	753,761	7
M.R.RR.	43,287		43,287	43,287		43,287	8
	*5,705	Paid for	*5,705	*5,705		*5,705	9
	2,023,574	1,071,810	956,764	1,685,330	888,387	796,943	10
C.M.St.P.RY. own trains	30,724		30,724	30,734		30,734	11
C.& N.W.RY. own trains	10,980		10,980	10,980		10,980	12
	2,060,278	1,071,810	988,468	1,717,034	888,387	828,647	13
Lt. Locos.	56,696	39,613	16,993	80,638	68,206	12,652	
" " Spl.	212	169	43	160	135	25	
	56,818	39,782	17,036	80,798	67,121	12,677	14

11-A. Freight trn. miles into Michigan.
888,287 82.9799%
1,071,810

11-B. Pass. trn. Miles into Michigan.
796,943 82.2957%
956,764

11-C. Trn. miles Mich. including Rd. Switch and lt. locos—excluding Mineral Range.
F. 925,508
P. 799,142 46.3365%
1,724,650

11-D. Trn. miles switch and Rd. and lt. locos—made on track Michigan (factor 15 included and M.R. RR. excluded.)
F. 895,623
802,555 44.6318%
F 1,798,178

11-E. Miles less M.R.RR. plus swi. from factor 15.
F. 1,205,786
806,446 40.0772%
2,012,232

11-F. Miles less Rd. Swi. and M.R. plus lt. engines—plus switching yard.
F. 1,085,011
761,062 41.2360%
1,846,073

11-G. Miles of frt. less mixed to Michigan.
874,159 82.8564%
1,057,582

11-H. Miles pass. to Mich. less mixed lines 10 & 2.
M.R. 4.5361%
Regular 78.7234%

11-J. Line 7.
753,761 45.9009%
1,642,148

Factor 12

1916

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

All Accounts up to General Expenses.

		System	Michigan	
I	Maintenance of Way & Structures	$ 583,103.47	$ 482,488.90	1
II	Maintenance of Equipment	430,018.83	365,008.76	2
III	Traffic Expenses	89,011.89	74,005.88	3
IV	Transportation Expenses	1,223,400.01	1,044,022.69	4
VI	Miscellaneous	43,983.68	35,899.48	5
		2,369,517.88	2,001,425.71	
			84.4655%	6

		Michigan	Passenger	9
I	Maintenance of Way & Structures	482,488.90	121,659.67	10
II	Maintenance of Equipment	365,008.76	92,798.71	11
III	Traffic Expenses	74,005.88	34,514.26	12
IV	Transportation Expenses	1,044,022.69	302,167.74	13
VI	Miscellaneous	35,899.48	35,899.48	14
		2,001,425.71	387,039.86	
			29.3311%	15

Corrected factor not used except in Taxes 28.9968% 16
Passenger to Service.

All accounts less 227B, which is overhead and less Mineral Range.

Total	Passenger & Baggage	Sleepers	Diners	Mail & Express	
570,823.65	292,746.79	117,369.45	93,568.41	67,139.00	19
	51.2860%	20.5614%	16.3918%	11.7618%	20

1916.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Gross Weights—Trains.

A.	—Freight— All Tracks	—Freight— Common Tracks	—Passenger— All Tracks	—Passenger— Common Tracks
Cars	284,135,206	284,135,206	166,323,158	166,323,158
Locomotives	94,579,388	94,579,388	83,137,467	83,137,467
Loading	245,188,330	245,188,330	7,831,580	7,831,580
Total train wts.	623,902,924	623,902,924	257,292,205	257,292,205
Train switching	22,395,219	12,751,838	346,264	346,264
Yard switching	63,577,162	28,575,038	988,538	461,944
	709,875,305	665,229,800	258,627,007	258,100,413
Ton miles Co's freight (est)	8,248,540	8,248,540		
Total gross wts.	718,123,845	673,478,340	258,627,007	258,100,413
				27.7057%
Above includes Co. frt. and wts. of cars carrying same.	13,443.007	13,443,007		

Per cent. ignoring company freight

Factor 14

1916

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Mileage of track chargeable to Services and percentage of same on basis of 2 miles side track equal to 1 mile main track.

	Miles	Adjusted 2 to 1	
Common to Freight and Passenger			
Main track	408.85	408.85	
Second track	6.55	6.55	
Sidings	40.62	20.31	
	456.02	435.71	82.6163%
Exclusive Freight			
Main track	12.07	12.07	
Ore spurs	21.57	10.79	
Industrial spurs	21.43	10.76	
Sidings	114.01	57.01	
	169.08	90.63	17.1846%
Exclusive Passenger			
Sidings	2.10	1.05	.1991%

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Switching Miles—Michigan.
Statement of Work Miles.

		—Freight—		—Passenger—		
		Total	On Common Track	Total	On Common Track	
Yards						1
Freight	97.46%	280,278	122,121			2
Passenger	2.54%			7,304	3,413	3
						4
						5
Train						6
Freight		120,775	68,769			7
Passenger				2,202	2,202	8
						9
Yards		System	Michigan			10
		296,924	287,582		96.8537%	11
						12
Work		47,905	36,470		76.13%	13
						14

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Combining Factors 13, 14, and 15 for division of track accounts in Michigan.

A.				Passenger
Freight	(Factor 14)	17.1846%		
Passenger	" 14	.1991%		.1991%
Common	" 14	82.6163%	Factor 13-11	22.8894%
			Total Passenger Percent Weights	23.0885%

B.				
Freight	(Factor 14)	17.1846%		
Passenger	" 14	.1991%		.1991%
Common	" 14	82.6163%	Factor 11-D	36.8730%
			Total percent Passenger Train Miles	37.0721%

Duluth South Shore & Atlantic Railway Company.

Details of weights ton miles of Passenger cars and contents to various passenger services.

Mr. Parker's basic figures—Common tracks.

A

		Passenger & Baggage	Mail & Express	Sleepers	Diners	
Pass. cars			582,738			1
Other Pass. train cars.			21,253,704			2
Sleepers, parlor & Obs. For.				15,139,284		3
Dining cars For.					5,098,616	4
Sleepers D.S.S.& A.Ry.				29,733,670		5
Obs. Dinners "					11,564,522	6
Diners "					7,130,268	7
Train loading			3,379,268			8
Total	$174,154,738	46.0928%	25,215,710 14.4789%	44,872,954 25.7661%	23,793,406 13.6622%	9 10
Pass. train Switching	346,264		57,711			11
	174,501,002		25,273,421	44,872,954	23,793,406	12
Pass. yard Switching	461,944		18,339	188,568	99,985	13
	174,962,946		25,291,760	45,061,522	23,893,391	14
Percentage		46.1334%	14.4555%	25.7549%	13.6562%	15

B. Tonnages handled by D.S.S.& A.Ry. Engines.

Pass. cars	60,769,164		582,738			
Other "	33,383,407		21,230,826			
Sl'pr. Par. & Obs. For.	14,819,544			14,819,544		
Diners For.	5,098,616				5,098,616	
Sl'pr. D.S.S.& A.	29,733,670			29,733,670		
Obs. Diners "	11,564,522				11,564,522	
Diners "	7,130,268				7,130,268	
	162,499,191		21,813,564	44,553,214	23,793,406	
Trn. Loading	7,514,540		3,062,228			
	170,013,731		24,875,792	44,553,214	23,793,406	
Percentage						
Pass. trn. Swi.	346,264		57,711			
	170,349,995		24,933,503	44,553,214	23,793,406	
Percentage		45.2760%	14.6027%	26.1539%	13.9674%	28

Duluth South Shore & Atlantic Railway Company.

Details of car miles on passenger trains to various passenger services.

Mr. Parker's Basis—Michigan.

	Total	Passenger & Baggage	Mail & Express	Sleepers	Diners	
Passenger cars	1,691,425	1,668,201	23,224			1
" " Sp'l	5,251	5,251				2
Other Pass. trn. cars	844,036	313,728	530,308			3
" " " " Sp'l	1,330	1,330				4
D.S.S.& A.Ry. Obs. Diners	179,614				179,614	5
" Diners	115,678				115,678	6
Foreign "	76,042				76,042	7
Foreign Sleepers, Parlors & Obs.	212,539			212,539		8
Foreign Sleepers, Parlor & Obs. Spl.	80			80		9
D.S.S.& A. Sleepers	516,333			516,333		10
	3,642,328	1,988,510	553,532	728,952	371,334	
Percentage		54.5945%	15.1972%	20.0134%	10.1949%	11
Marquette run of C.M.& St.P.& C.& N.W.RYs.	104,827	99,303	1,144	4,380		12
	3,747,155	2,087,813	554,676	733,332	371,334	13
Percentage		55.7173%	14.8026%	19.5704%	9.9097%	14
D.S.S.& A. on M.R.RR.	62,320	62,320				15
D.S.S.& A. other Pass. cars on M.R.RR.	69,030	22,183	36,847			16
	3,868,505	2,172,316	591,523	733,332	371,334	17
Percentage		56.1539%	15.2907%	18.9565%	9.5989%	18
Switching at St. Ignace—Parker's figures—(A-100)						20
	2,040	1,100	265	455	220	21
		53.9216%	12.9902%	22.3039%	10.7843%	22

Lines 1 to 4 553,532 = 21.7151% M. & E. 23

2,542,042

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Factors for assignment of Passenger & Baggage. Expenses to INTER and INTRA.

Factors INTRA 1 to 7

Factor 1 Time consumed in coupon ticket sales by actual test was 5.75 times that consumed in simplex tickets.
Mineral Range coupon tickets did not participate in the above time Ratio being sold in the same average time as Simplex tickets.
Test applied to sales is as follows:

	No of tickets. Intra No.	Inter No.		No of tickets adjusted by time ratio. Intra No.	Inter No.
Simplex	362,322	8,720	A-1	362,322	8,720
M. R. Coupon	44,577		A-1	44,577	
Other Coupons	11,144	11,217	A-5.75	64,078	64,507
Mileage Agts.	11,434	332	A-5.75	65,695	1,909
				536,672	75,136
				87.55%	

Factor 2 Inter & Intra Passenger miles

Inter	8,665,624	
Intra	21,016,459	70.8052%
	29,682,083	

Factor 3 Overhead for Maintaining of Way & Structure.

Inter	$15,083.81	
Intra	37,278.30	71.1983%

Factor 4 By investigation conducted in part by Mr. Heiss and called the Heiss ratio the intra percentage of the following accts. was determined. Set up by the Ry. Co. and accepted by us.

A. Outside Agencies	7.97%
B. Advertising	30.94

Factor 5 Overhead for Traffic Expenses.

Inter	$16,947.96	
Intra	5,985.39	26.009%

Factor 6 Overhead for Transportation.

Inter	$ 39,665.01	
Intra	108,715.04	73.268%

Factor 7 Overhead for General Expenses.

Inter	$ 96,071.32
Intra	194,100.54

1916

Duluth South Shore & Atlantic Railway

DISTRIBUTION OF

OPERATING EXPENSES

BY PRIMARY ACCOUNTS

A. System.
Michigan Passenger.
Michigan Passenger Services.

Followed by Tabulations of these Accounts.

B. Assignment of Passenger and Baggage Expenses to INTER and INTRA.

C. Distribution of Income Accounts up to Return on Investment.

The basic figures as used in the following computations and divisions of Expenses are used as taken from the books and records of the company, without adjustment for the purpose of reducing them to those necessary for a normal year of operation and are subject to adjustment to be made to eliminate expenditures to make good deferred maintenance, and those for additions and betterments.

It is the claim of defendants that the expenses in the maintenance of way group of these years were excessive in at least the amount of—

1914	$202,000
1915	20,000
1916	17,000
1917	90,000

The presentation of the following computations of income is not intended to waive the claim that the passenger earnings of the M. T. Co. are to be added to the net corporate income of the passenger business, particularly if sleeping car and dining car operations are to be included.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts.

Account
201 SUPERINTENDENCE, MAINTAINING OF WAY & STRUCTURES.

	System	Michigan	Passenger
	$24,650.94		
To Michigan Factor 1-6		$20,511.01	
Michigan to Passenger Factor 1-20			$ 5,539.59

Assignment of Passenger to Services.

Passenger & Baggage	Factor 1, Line 20	$ 2,581.43
Sleepers	" 1, " 20	1,412.54
Diners	" 1, " 20	746.89
Mail & Express	" 1, " 20	798.73

Account
202 ROADWAY MAINTENANCE.

	System	Michigan	Passenger
	$67,951.15		
To Michigan Located M.A.Co.		$57,991.88	
Michigan to Passenger Factor 11-C			$26,871.41

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 15	$12,396.70
Sleepers	" 17, " 15	6,920.70
Diners	" 17, " 15	3,669.61
Mail & Express	" 17, " 15	3,884.40

Account
208 BRIDGES, TRESTLES & CULVERTS.

	System	Michigan	Passenger
	$60,062.16		
Located to Michigan M.A.Co.		$45,887.33	
	Freight	Common	
Mich. located to freight	$2,661.13	$43,226.20	
Common to Passenger on Factor 13-12			$11,976.12

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 15	$ 5,524.99
Sleepers	" 17, " 15	3,084.44
Diners	" 17, " 15	1,635.48
Mail & Express	" 17, " 15	1,731.21

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

Account 212 TIES.

	System	Michigan	Passenger
	$70,021.27		
Located to Michigan		$56,379.05	
Michigan to Passenger Factor 16			$13,017.08

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 15	$ 6,005.22
Sleepers	" 17, " 15	3,352.54
Diners	" 17, " 15	1,777.64
Mail & Express	" 17, " 15	1,881.68

Account 214 RAILS.

	System	Michigan	Passenger
	$ 5,433.07		
Located to Michigan		$ 4,660.93	
Michigan to Passenger Factor 16			$ 1,076.14

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 15	$ 496.46
Sleepers	" 17, " 15	277.16
Diners	" 17, " 15	146.96
Mail & Express	" 17, " 15	155.56

Account 216 OTHER TRACK MATERIAL.

	System	Michigan	Passenger
	$23,218.15		
Located to Michigan		$20,097.14	
Michigan to Passenger Factor 16			$ 4,640.13

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 15	$ 2,140.65
Sleepers	" 17, " 15	1,195.06
Diners	" 17, " 15	633.67
Mail & Express	" 17, " 15	670.75

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

Account 218 BALLAST.

	System	Michigan	Passenger
	$ 3,035.05		
Located to Michigan		$ 2,975.60	
Michigan to Passenger Factor 16			$ 687.02

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 15	$ 316.95
Sleepers	" 17, " 15	176.94
Diners	" 17, " 15	93.82
Mail & Express	" 17, " 15	99.31

Account 220 TRACK LAYING & SURFACING.

	System	Michigan	Passenger
	$180,348.86		
To Michigan. Located by M.A.Co.		$145,612.78	
Michigan to Passenger Factor 16			$33,619.81

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 15	$15,509.96
Sleepers	" 17, " 15	8,658.75
Diners	" 17, " 15	4,591.19
Mail & Express	" 17, " 15	4,859.91

Account 221 RIGHT OF WAY FENCES.

	System	Michigan	Passenger
	$ 6,928.08		
Located to Michigan		$ 6,081.34	
Michigan to Passenger Factor 11-C			$ 2,437.23

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 15	$ 1,124.38
Sleepers	" 17, " 15	627.71
Diners	" 17, " 15	332.83
Mail & Express	" 17, " 15	352.31

Details of Distribution of Primary Accounts (Continued).

Account
223 SNOW, SAND FENCES & SNOW SHEDS.

	System	Michigan	Passenger
	$ 432.31		
Located to Michigan		$ 198.16	
Michigan to Passenger Factor 11-C			$ 79.42

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 15	$ 36.64
Sleepers	" 17, " 15	20.45
Diners	" 17, " 15	10.85
Mail & Express	" 17, " 15	11.48

Account
225 CROSSING & SIGNS.

	System	Michigan	Passenger
	$ 1,666.78		
Located to Michigan Freight		$ 123.61	
Common		780.66	
Michigan Common to Passenger Factor 11-E			$ 312.87

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 15	$ 144.34
Sleepers	" 17, " 15	80.58
Diners	" 17, " 15	42.73
Mail & Express	" 17, " 15	45.22

Account
227 STATION & OFFICE BUILDINGS.

	System		
	$9,723.78		
	Freight	Passenger	Common
A. Sta. Bldgs. Grounds. Mich. located M.A.Co.	2,832.62	753.68	4,224.54
B. Office Bldgs.			64.98
C. Track Scales	1,142.75		
Michigan to Passenger A. Direct		753.68	
A. Common on Acct. 373		700.64	
B. Common Factor 9-3		18.62	
Total Passenger		1,472.94	

Details of Distribution of Primary Accounts (Continued).

ACCOUNT 227—Continued.

Assignment of Passenger to Services.

Passengers & Baggage	A. 1,213.54	B.	Pass. & Bag.	12-20	$9.55
Sleepers Acct. 373, 6.556%	95.35		Sleepers	12-20	3.83
Mail & Express	145.43		Diners	12-20	3.05
			Mail & Exp.	12-20	2.19

Account
229 ROADWAY BUILDINGS.

	System	Michigan	Passenger
	$ 2,570.61		
Located to Michigan		$ 2,514.69	
Michigan to Passenger Factor 1-10			$ 672.28

Assignment of Passenger to Services.

Passenger & Baggage	Factor 1,	Line	20	$ 313.28
Sleepers	" 1,	"	20	171.42
Diners	" 1,	"	20	90.64
Mail & Express	" 1,	"	20	96.94

Account
231 WATER STATIONS.

	System	Michigan	Passenger
	$ 8,284.06		
To Michigan Factor 5-B		$ 7,016.14	
Michigan to Passenger Factor 5-C			$ 2,136.76

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17,	Line	28	$ 967.44
Sleepers	" 17,	"	28	558.85
Diners	" 17,	"	28	298.45
Mail & Express	" 17,	"	28	312.02

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

Account
233 FUEL STATIONS.

	System	Michigan	Passenger
	$ 2,435.96		
To Michigan Factor 5-B		$ 2,065.85	
Michigan to Passenger Factor 5-D			$ 644.83

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 28	$ 291.95
Sleepers	" 17, " 28	168.65
Diners	" 17, " 28	90.07
Mail & Express	" 17, " 28	94.16

Account
235 SHOPS & ENGINE HOUSES.

	System	Michigan	Passenger
A. Shops Located	$ 1,118.96		
B. Engine house located	19,028.15		
To Mich. A. Shops Factor 2-3		$ 950.57	
B. Enginehouses Soo Eng. House all Mich.		14,835.00	
4360.31 Factor 4-3		3,913.74	
To Pass. A. Shops Factor 3-6			$ 256.86
B. Engine Houses Factor 4-5			5,655.18

Assignment of Passenger to Services.

A. Passenger & Baggage	Factor 2, Line 16	$ 140.22
Sleepers	" 2, " 16	46.32
Diners	" 2, " 16	29.03
Mail & Express	" 2, " 16	41.29
B. Passenger & Baggage	Factor 17, Line 28	$ 2,560.44
Sleepers	" 17, " 28	1,479.05
Diners	" 17, " 28	789.88
Mail & Express	" 17, " 28	825.81

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

Account
241 WHARVES & DOCKS.

	System	Michigan		
A-1 St. Ignace Mdse. Dock	$ 626.19			
A-2 " " Slip "	689.34			
B. Marquette Mdse. Dock	128.70	Freight	Common	
To Mich. A-1 " "		$ 626.19		
A-2 Slip "			$	689.34
B Mdse. Dock		128.30		

Michigan Common assigned to Passenger on basis of cars handled over slip. Freight cars counted 1. Passenger cars counted 2.

19.02% Pass. Common 689.34 x 19.02% — $131.30 Passenger.

Assignment of Passenger to Services.

Passenger & Baggage	Factor 18-22	$ 70.80
Sleepers	" 18-22	29.28
Diners	" 18-22	14.16
Mail & Express	" 18-22	17.06

Account
243 COAL & ORE WHARVES.

	System	Michigan	
Marquette Ore Dock	$12,688.13	$12,688.13	All freight

Account
244 COAL & ORE WHARVES—Depreciation.

System	Michigan	
$19,145.88	$19,145.88	all freight

Details of Distribution of Primary Accounts (Continued).

Account
247 TELEGRAPH & TELEPHONE LINES.

		System	Michigan	Passenger
		$ 3,487.05		
Assigned & Located.	Accepted		$ 3,032.11	
Factor 9-3				$ 869.01

Assignment of Passenger Expenses to Services, of which A. 453.40 is on train miles & B. 415.61 on Car miles.

	Factor 18-11	Factor 12-10
Passenger & Bag.	$439.10	" 12-10
Sleepers	197.83	" 12-10
Diners	103.00	" 12-10
Mail & Express	129.08	" 12-10

Account
249 SIGNAL & INTERLOCKER.

	System	Michigan	Passenger
	$ 279.16		
Located		$ 177.81	
Time & No. trains spl. Factor 5.24%			$ 9.32

Assignment of Passenger expenses to Services.

Passenger & Baggage	Factor 17-10	$ 4.30
Sleepers	" 17-10	2.40
Diners	" 17-10	1.27
Mail & Express	" 17-10	1.35

Account
265 MISCELLANEOUS STRUCTURES.

	System	Michigan	Passenger
Located	$ 140.25	$ 140.25	
Factor 1-12			$ .37.88

Assignment of Passenger to Services.

Passenger & Baggage	Factor 1, Line 20	$ 17.65
Sleepers	" 1, " 20	9.66
Diners	" 1, " 20	5.11
Mail & Express	" 1, " 20	5.46

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

Account
269 ROADWAY MACHINES.

	System	Michigan	Passenger
	$ 1,776.27		
Factor 1-1		$ 1,466.25	
" 1-12			$ 396.00

Assignment of Passenger to Services.

Passenger & Baggage	Factor 1, Line 20	$ 184.53
Sleepers	" 1, " 20	100.98
Diners	" 1, " 20	53.39
Mail & Express	" 1, " 20	57.10

Account
271 SMALL TOOLS & SUPPLIES.

	System	Michigan	Passenger
	$ 6,416.03		
Factor 1-6		$ 5,338.51	
" 1-12			$ 1,441.82

Assignment of Passenger to Services.

Passenger & Baggage	Factor 1, Line 20	$ 671.88
Sleepers	" 1, " 20	367.65
Diners	" 1, " 20	194.40
Mail & Express	" 1, " 20	207.89

Account
272 REMOVAL SNOW, SAND & ICE.

	System	Michigan	Passenger
	$42,979.90		
Located		$38,074.55	
Passgr. 1% direct by agreement			$ 380.75
Freight 29% " " "			
Com. 70% " " " = $26,652.18			
26,652.18 Factor 11-E			10,681.45
		Total Passgr.	11,062.20

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

ACCOUNT 273—Continued.

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17-12	$ 5,107.05
Sleepers	" 17-12	2,844.64
Diners	" 17-12	1,508.34
Mail & Express	" 17-12	1,602.17

Account 274 INJURIES TO PERSONS.

	System	Michigan	Passenger
	$ 1,407.24		
Located accept		$ 822.74	
	Freight Common		
Michigan	$ 96.44 $726.30		
Common Factor 1-12			$ 196.16

Assignment of Passenger to Services.

Passenger & Baggage	Factor 1, Line 20	$ 91.41
Sleepers	" 1, " 20	50.02
Diners	" 1, " 20	26.45
Mail & Express	" 1, " 20	28.28

Account 275 INSURACNCE.

	System	Michigan	Passenger
	$ 4,298.73		
Located Freight		$ 1,091.40	
" Passenger		98.90	98.90
" Shops & Cts.	268.00	227.67	
Factor 2-1			
" Other Com.		2,372.05	
Total Mich.		3,790.02	
Com. 2599.72 Factor 1-6			702.13
		Total Passenger	801.03

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

ACCOUNT 275—Continued.

Assignment of Passenger to Services.

98.90 on acct. 373. Stations 702.13. Factor 1-20

Passenger & Baggage	$ 409.72
Sleepers	185.52
Diners	94.66
Mail & Express	111.13

Account 276 STATIONERY & PRINTING.

	System	Michigan	Passenger
	$ 1,109.13		
Factor 1-6		$ 922.86	
" 1-16			$ 249.25

Assignment of Passenger to Services.

Passenger & Baggage	Factor 1, Line 20	$ 116.15
Sleepers	" 1, " 20	63.56
Diners	" 1, " 20	33.61
Mail & Express	" 1, " 20	35.93

Account 277 OTHER EXPENSES, MAINTAINING OF W. & S.

	System	Michigan	Passenger
	$ 243.89		
Factor 1-6		$ 202.93	
" 1-16			$ 54.81

Assignment of Passenger to Services.

Passenger & Baggage	Factor 1, Line 20	$ 25.54
Sleepers	" 1, " 20	13.98
Diners	" 1, " 20	7.39
Mail & Express	" 1, " 20	7.90

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

Account 278 MAINTENANCE OF JT. TRKS., YARDS & TERMINALS. DR.

	System	Michigan	Passenger
	$13,818.15		
Located		$ 8,402.40	
	Freight	Common	Passenger
Mich. located	$ 7,512.16	$ 31.88	$ 858.36
Common 1-12			8.61
			866.97

Assignment of Passenger to Services.

Passenger & Baggage	Factor 18-11	$ 473.33
Sleepers	" 18-11	173.51
Diners	" 18-11	88.37
Mail & Express	" 18-11	131.76

Account 279 MAINTENANCE OF JT. TRKS., YARDS & TERMINALS. CR.

	System	Michigan	
	13,818.15	13,818.15	
	Common	Freight	Passenger
Mich. located	6,606.43	3,228.88 c	3,982.84
Com. Tracks	5,575.89	Factor 16 A c	1,287.39
" Stations	204.63	Acct. 373 a	33.92
" Bridges	280.40	" 272 c	81.43
" Tanks & Eng. H.	545.63	Factor 5-c b	166.17
		Total Passenger	5,551.75

Assignment of Passenger as follows:

A. Acct. 373		B. Factor 17-28	C. Factor 17-15
Passgr. & Baggage	28.31	75.23	2,468.91
Sleepers	2.22	43.46	1,378.31
Diners		23.21	730.83
Mail & Express	3.39	24.27	773.61

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

Account
301 SUPERINTENDENCE, MAINTAINING OF EQUIPMENT.

	System	Michigan	Passenger
	$12,673.28		
Factor 2-1		$10,766.14	
" 2-6			$ 8,011.15

Assignment of Passenger to Services.

Passenger & Baggage		Factor 2-16	$ 1,572.48
Sleepers		" 2-16	519.52
Diners		" 2-16	325.57
Mail & Express		" 2-16	463.11
Mineral Range	4.333%		130.47

Account
302 MACHINERY.

	System	Michigan	Passenger
	$ 8,783.82		
Factor 2-1		$ 7,461.99	
" 2-6			$ 2,087.02

Assignment of Passenger to Services.

Passenger & Baggage		Factor 2-16	$ 1,139.24
Sleepers		" 2-16	376.39
Diners		" 2-16	235.87
Mail & Express		" 2-16	335.52

Account
308 STEAM LOCO. REPAIRS.
A. Road—Located by individual locomotive and miles.

	System		Michigan	Passenger
Freight	51,102.55	Factor 6-F	42,545.38	
Mixed	578.71	" 15.91%	578.71	92.07
Special	87.69	" 6-G	70.44	6-G 30.75
Passgr.	35,159.31	" 6-E	29,030.83	29,030.83
" Road Sw.	129.26		129.26	129.26
Mineral Range Run	1,523.41		1,523.41	1,523.41
Totals			73,878.03	30,806.32

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

ACCOUNT 308—Continued.

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17-28		$13,258.13
Sleepers	" 17-28		7,058.62
Diners	" 17-28		4,090.06
Mail & Express	" 17-28		4,276.10
Mineral Range	" 17-28		1,523.41
B. Switch	System	Michigan	Passenger
	$ 14,407.91		
Factor 15-11		$13,954.59	
2.54%			$ 354.55
Passenger & Baggage	Factor 18-22	$ 157.45	
Sleepers	" 18-22	118.33	
Diners	" 18-22	60.97	
Mail & Express	" 18-22	17.85	

Account

309 STEAM LOCO. DEP'N.

Located by M.A.Co. by individual engines and mileages

A. Road

	System		Michigan		Passenger
Freight	$12,469.35	Factor 6-F	$10,381.34		
Passgr.	6,643.02	" 6-E	5,485.10		$5,485.10
" Road	21.27		21.27		21.27
Min. Range Run	325.28		325.28		325.28
Mixed	180.42		155.10	15.91%	24.68
Special	29.05	" 6-G	23.34	6-G	10.18
			16,391.43		5,866.51

Assignment of Passenger to Services.

Passenger & Baggage		Factor 17-28			$ 2,508.65
Sleepers		" 17-28			1,429.26
Diners		" 17-28			773.96
Mail & Express		" 17-28			809.17
Mineral Range		" 17-28			325.28
B. Switch	3,368.77	Factor 15-11	3,179.91	2.54	82.87

Details of Distribution of Primary Accounts (Continued).

ACCOUNT 309—Continued.

Assignment of Passenger to Services.

Passenger & Baggage	Factor	15-11	$ 36.81
Sleepers	"	15-11	27.67
Diners	"	15-11	14.25
Mail & Express	"	15-11	4.14

Account

310 STEAM LOCO. RETIREMENTS.

3. Road located by M.A.Co.

	System			Mich.	Passgr.
Freight	*69.59	Factor	6-c	*58.08	
Passenger	27.16	"	6-D	22.65	22.65
Work	11.07	"	15-13	8.42	.56

Work on overhead including switch—1.19 is Mineral Range Run proportion

Assignment of Passenger to Services.

Passenger & Baggage	Factor	17-28	$ 9.97
Sleepers	"	17-28	5.76
Diners	"	17-28	3.08
Mail & Express	"	17-28	3.21
Mineral Range Run	"	17-28	1.19

B. Switch

System		Michigan		Passenger
863.09	Factor 15-11	835.90	2.54%	21.23

Assignment of Passenger to Services.

Passenger & Baggage	Factor	18-22	$ 9.43
Sleepers	"	18-22	7.09
Diners	"	18-22	3.65
Mail & Express	"	18-22	1.06

*Credit Deduct

DULUTH SOUTH SHORE & ATLANTIC R(ILW(Y COMPANY.

Details of Distribution of Primary Accounts (Continued).

Account

314 FREIGHT TRAIN CAR Repairs — Company figures accepted.
315 " " " Dep'n — "
316 " " " Retirement — "
317 PASSENGER TRAIN CAR Repairs.

	System			Mich.
Total	$46,155.39			
Sleepers (1914) figure	5,454.97	Factor	17-10	3,977.79
Diners	3,850.21	"	17-10	3,238.24
All other	36,850.21	"	7-A	30,240.53

of which Mineral Range Run is $1,596.09

Assignment of Passenger to Services.

Passenger & Baggage		18-23	$22,424.27
Mail & Express		18-23	6,220.17
Sleepers	Direct		3,977.79
Diners	"		3,258.24
Mineral Range	"		1,596.99

Account

318 PASSENGER TRAIN CARS DEP'N.

		System			Mich.
A.	On value all other cars	$7,262.00	Factor	7-A	$5,959.45
B.	" " Sleepers	2,684.00	"	7-10	1,957.18
C.	" " Diners	2,421.00	"	7-13	2,036.19

$314.54 of A. due to Mineral Range Run.

Assignment of Passenger to Services.

Passenger & Baggage	Factor	18-23	$ 4,419.11
Mail & Express	"	18-23	1,225.80
Sleepers	Direct		1,957.18
Diners	"		2,036.19
Mineral Range Run			314.54

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

Account
326 to 328 WORK EQUIPMENT.

		Repairs	Dep'n	Retirement
System		6,599.40	3,483.32	*8.19
Michigan	Factor 1-1	5,447.59	2,875.37	*6.76
" Pasngr.	" 1-10	1,456.36	768.70	*1.81

Assignment of Passenger to Services.

Passenger & Baggage	Factor	1-17 & 18	672.44	354.93	*.84
Sleepers	"	1-17 & 18	347.67	197.76	*.47
Diners	"	1-17 & 18	198.64	104.84	*.24
Mail & Express	"	1-17 & 18	210.61	111.17	*.26

*Credit—Deduct.

Account
332 INJURIES TO PERSONS.

	System			Mich.
Freight	3,984.85	Factor	8-12	3,430.15
Passenger	85.15	"	7-a	69.88
Common	255.16	"	2-1	210.63
				3,710.66
Michigan Passgr.	Direct		69.88	
Com. on	2-6		58.91	
Total Passgr.			128.79	

Assignment of Passenger to Services.

Passenger & Baggage	Factor	2-16	70.30
Sleepers	"	2-16	23.23
Diners	"	2-16	14.56
Mail & Express	"	2-16	20.70

Details of Distribution of Primary Accounts (Continued).

Account
333 INSURANCE.

		System	Mich.	Passgr.
A.	Passgr. & Bag.	$ 186.16	152.77	
B.	Sleepers	78.44	57.20	
C.	Diners	72.04	60.59	
D.	Locos Frt.	170.24		
E.	" Pass.	72.96	60.24	330.80
F.	Shops	515.20		
G.	Engine House	34.40	Agreed 576.59 on 2-6	161.32
F.	Work	52.72		
G.	Overheads	44.00		
H.	Frt. Cars	1,190.93		
		2,417.19	Agreed 2,074.61	492.12

Assignment of Passenger to Services.

	Pangr. & Bag	Sleepers	Diners	Mail & Exp.
A. Factor 18-23	119.60			
B. C. Direct		57.20	60.59	33.17
E. Factor 17-28	27.28	15.75	8.41	8.80
161.32 Factor 2-16				
	88.07	29.09	18.23	25.93

Account
334 STATIONERY & PRINTING.

	System	Michigan	Passenger
	$1,316.23		
Factor 2-4		1,119.13	
" 2-9			285.75

Assignment of Passenger to Services.

Passenger & Baggage	Factor 2-16	$155.90
Sleepers	" 2-16	51.53
Diners	" 2-16	32.29
Mail & Express	" 2-16	45.94

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

Account 336 MAINTENANCE JT. EQT. AT TERMINALS.

	System	Michigan	Passenger
Located	$ 792.37	$ 14.69	$ 6.66

Assignment of Passengers to Services.

Passenger & Baggage	Factor 2-16	$ 3.64
Sleepers	" 2-16	1.20
Diners	" 2-16	.75
Mail & Express	" 2-16	1.07

Account	TRAFFIC EXPENSES.	System	Michigan	Passenger
351	Superintendence	$31,604.38	$26,123.17	$11,580.91
352	Outside Agencies	35,099.56	29,004.50	14,210.80
353	Advertising	4,078.18	3,362.69	3,319.24
354	Traffic Association	277.69	229.94	
355	Fast Freight Lines	*9.81	*8.13	
357	Insurance	113.28	59.00	59.00
358	Stationery & Printing	9,384.71	7,758.25	3,138.52
	All above accepted on company's figures.			
356	Ind. & Immgn.	8,463.90	7,476.46	2,205.79
	On earnings basis entirely.			
	All passenger Exp. assigned to Passgr. & Baggage.			
	*Credit—Deduct.			

Account 371 SUPERINTENDENCE—TRANSPORTATION.

	System	Michigan	Passenger
	$20,755.37		
Car Accts. office	4,520.65		
Bal. on 9-1	16,234.72	13,978.05	
15% Car accounting passenger	678.10	Factor 7-20	$ 566.81
85% " " Freight	3,842.55	" 8-12	3,307.27
Total Michigan			$17,852.13
17852.13 Factor 9-3 incl. Mineral Range			213.33
Passenger $5,116.49			

Error here inadvertently made in calculating Passenger; should have been 13,978.05 on 9-3.

4,006.16 — 566.81 = 4,572.97 Error $543.52 which is yet unadjusted.

Details of Distribution of Primary Accounts (Continued).

ACCOUNT 371—Continued.

Assignment of Passenger to Services.

Passenger & Baggage	Factor 9-12	$ 2,612.95
Sleepers	" 9-12	1,176.49
Diners	" 9-12	508.42
Mail & Express	" 9-12	605.30
Min. Range Run	" 9-12	213.33

Account 372 DISPATCHING TRAINS.

	System	Michigan	Passenger
	$12,804.19		
Co.'s figures train miles		$10,815.07	
1/3 to trains 2/3 to cars, we allow one of the 2/3 as the reciprocal service of the agencies securing orders, therefore 2 parts on			
Factor 11-E =		82.452%	
Less % charged in 373		16.578	
Balance =		65.874	
Divided by 3 (parts)		21.958%	2,374.77

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17, Line 15	$ 1,095.57
Sleepers	" 17, " 15	611.62
Diners	" 17, " 15	324.30
Mail & Express	" 17, " 15	343.28

Account 372 STATION EMPLOYEES.

	System	Michigan		
	$159,423.40			
Located		$141,572.25		
	Freight	Passenger	Common	
Located by M.A.Co.	$60,160.21	11,955.27	$69,456.77	
Common on located 16.578%		11,514.54		
		23,469.81		

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

ACCOUNT 372—Continued.

Assignment of Passenger to Services.

Memo. of Passgr. to mail is almost exactly 10% of total located hence we assign 10% of sta. service to mail & Express. Test of time consumed in sales combined with number tickets sold gives 6.556% of sta. Service as Sleeper.

Passenger & Baggage	$19,584.15
Sleepers	1,538.68
Mail & Express	2,346.98

Account 372 STATION SUPPLIES & EXPENSES.

	System	Michigan	
	$10,710.44		
Located by Co., accepted		$ 9,750.85	
	Freight	Passenger	Common
Located by Co.	2,948.76	1,332.20	$ 5,669.89
Common on Acct. 373		906.80	
Total Passgr.		2,239.00	

All assigned to Passenger & Baggage.

Account 377 to 389 YARD EXPENSES.

Located to yards by Services & mileage.

	Miles		Cost		Passgr.
Yard	Freight	Passgr.	Total	Passgr.	%
Marquette	143,721	5,264	$70,736.39	2,496.99	3.53
St. Ignace	47,190	2,040	22,084.15	914.28	4.14
All other	All freight		44,486.32		
			137,306.86	3,411.27	

Assignment of Passenger to Services.

Passenger & Baggage	Factor 18, Line 22	$ 1,515.29
Sleepers	" 18, " 22	1,139.02
Diners	" 18, " 22	586.74
Mail & Express	" 18, " 22	170.22

Located by Mr. C. A. Parker—accepted by M. A. Co.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

Account
390 OPERATING JT. YDS. & TERMINALS. DR.

	System	Michigan	Passgr.
Located by M. A. Co.	$25,994.44		
"		$17,712.24	
"			$ 6,199.24

Assignment of Passenger to Services.

Passenger & Baggage	Factor	9-12	$ 5,303.65
Sleepers	"	9-12	1,487.48
Diners	"	9-12	642.81
Mail & Express	"	9-12	765.30

Account
391 OPERATING JT. YDS. & TERMINALS. CR.

	System	Mich.	
Checked by M.A.Co.	$13,476.76	$13,476.76	
	Freight	Passgr.	Common
Located M.A.Co.	10,733.61	131.25	$ 2,611.90
Common on Road Engs. at Soo Rd. House 61.89%		1,616.44	
	Total	1,747.69	

Assignment of Passenger to Services.

Passenger & Baggage	Factor	9-12	$ 931.36
Sleepers	"	9-12	419.35
Diners	"	9-12	181.22
Mail & Express	"	9-12	215.76

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

Account 392 TRAIN ENGINE MEN.

	System			Mich.	Passenger
Freight	100,513.92	Factor	6M	83,684.57	
Passenger	72,575.33	"	6N	3,182.20	Min. Range
		"	6N	57,153.71	Regular
Mixed	1,427.84	all		1,427.84	
Assigned to Passenger					
Straight				57,153.71	
15.91% of Mixed				227.17	
Mineral Range				3,182.20	
Total				60,563.08	

Assignment of Passenger to Services.

Passenger & Baggage	Factor	17-28	$25,979.77
Sleepers	"	17-28	15,007.34
Diners	"	17-28	8,014.62
Mail & Express	"	17-28	8,379.15
Min. Range Run	"	17-28	3,182.20

Account 394 FUEL FOR TRAIN LOCOS.

	System			Michigan		Passgr.
Freight	196,007.75	Factor	6F	163,186.06		
Passenger	103,309.25	"	6H	81,587.03		81,587.03
		"		4,547.88	M. R.	4,547.88
Mixed	1,583.79			1,583.79	15.91%	251.98
Special	441.63	"	6G	354.76	6-L	154.87
				251,259.52		86,541.76

Assignment of Passenger to Services.

Passenger & Baggage	Factor	17-28	$37,123.55
Sleepers	"	17-28	21,444.59
Diners	"	17-28	11,452.42
Mail & Express	"	17-28	11,973.32
Mineral Range			4,547.88

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

Account 397 WATER FOR TRAIN LOCOS.

	System	Mich.	Passgr.	Min. R.
On percentage of Acct. 394	$14,353.67	$11,968.10	$3,905.56	$216.63

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17-28	$ 1,768.28
Sleepers	" 17-28	1,021.46
Diners	" 17-28	545.51
Mail & Express	" 17-28	570.31

Account 398 LUBRICANTS FOR TRAIN LOCOMOTIVES.

	System	Michigan	Passgr.	Min. R.
On percentages of 394	$5,614.91	$4,681.72	$1,527.78	$84.74

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17-28	691.72
Sleepers	" 17-28	399.57
Diners	" 17-28	213.39
Mail & Express	" 17-28	223.10

Account 399 OTHER SUPPLIES FOR TRAIN LOCOS.

Test of supplies issued from M. P. & M. dep't to individual locos. and spaced on train miles of each gives

		System	Factor	Michigan
Freight	64.6792%	$1,725.20	6-F	$1,436.28
Passgr.	33.3425%	889.10	6-K	734.49
M. Ran. Run	1.0422%	27.79	all	27.79
Mixed	.7528%	20.08	all	20.08
Special	.1653%	4.41	6-G	3.54
		2,666.58		2,222.18

Assigned to Passenger	
Direct	$ 734.49
Mineral Range Run	27.79
Mixed 15.91%	3.19
Spl. Factor 6-L	1.55
Total Passgr.	767.02

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

ACCOUNT 399—Continued.

Assignment of Passenger to Services.

Mineral Range Run		$ 27.79
Passenger & Baggage	Factor 17-28	334.69
Sleepers	" 17-28	193.34
Diners	" 17-28	103.25
Mail & Express	" 17-28	107.95

Account
400 ENGINE HOUSE EXPENSES—TRAIN.

	System	Mich.	Passgr.
	$45,258.80		
On Rev. Eng. Miles Co.		$39,328.78	
On agreed % of 41.7			$16,400.10

Assignment of Passenger to Services.

Passenger & Baggage	Factor 17-28	$ 7,425.31
Sleepers	" 17-28	4,289.27
Diners	" 17-28	2,290.67
Mail & Express	" 17-28	2,394.85

Account
401 TRAINMEN.

	System		Michigan		Passenger
Locat. Frt.	$135.577.72	Factor 11-G	$112,063.66		
" Pass.	62,593.91	" 11-H	49,275.43		$49,275.43
			2,833.08	M. R.	2,833.08
" Mix.	3,597.00	all	3,597.00	15.91%	572.28
			167,769.17		52,680.79

Assignment of Passenger to Services.

Passenger & Baggage direct		$22,082.53
Passenger & Baggage	Factor 18-11	15,158.26
Sleepers	" 18-11	5,556.76
Diners	" 18-11	2,830.63
Mail & Express	" 18-11	4,219.53
Mineral Range Run		2,833.08

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

Account
402 TRAIN SUPPLIES & EXPENSES.

	System	Factor	Michigan	Passenger
Frt. lubricat'g	$ 4,024.73	8-12	$3,464.47	
" other	3,765.81	11-A	3,124.87	
Pass. lubricat'g	14,967.12	7-C	Mineral Range	$ 675.53 C
		7-C		11,835.20 C
" other	11,641.54	11-C	Mineral Range	525.43 D
		11-C		9,171.47 D
				22,207.63

Assignment of Passenger to Services.

Passenger & Baggage	Factor 18-11	$6,461.57	$5,007.12
Sleepers	" 18-11	2,368.63	1,835.53
Diners	" 18-11	1,206.58	935.02
Mail & Express	" 18-11	1,798.62	1,393.80
Mineral Range Run		675.53	525.43

Account
403 OPERATING SLEEPING CARS.

	System	Michigan	Passenger
Located	$13,954.15	$10,566.08	$10,566.08
		All Passenger.	

Account
404 SIGNAL & INTERLOCKER OPERATIONS.

	System	Michigan	Passenger
	$1,539.84		
Located		$ 311.34	
On time of trains and cars on crossings			$ 16.31

Assignment of Passenger to Services.

Passenger & Baggage	Factor 18-14	$ 9.09
Sleepers	" 18-14	3.19
Diners	" 18-14	1.62
Mail & Express	" 18-14	2.41

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Primary Accounts (Continued).

Account
405 CROSSING PROTECTION.

	System	Michigan	Passenger
	$ 8,639.47		
Located to		$ 8,159.47	
On spl. factor time and trains 5.24%			$ 427.56

Assignment of Passenger to Services.

Passenger & Baggage	Factor	18-14	$ 238.22
Sleepers	"	18-14	83.68
Diners	"	18-14	42.37
Mail & Express	"	18-14	63.29

Account
407 TELEGRAPH & TELEPHONE EXPENSES.

	System	Michigan	Passenger
Located	$ 174.47	$ 174.47	
Factor 9-3			$ 50.00

Assignment of Passenger to Services.

Passenger & Baggage	Factor	9-12	$ 26.65
Sleepers	"	9-12	12.00
Diners	"	9-12	5.18
Mail & Express	"	9-12	6.17

Account
410 STATIONERY & PRINTING.

	System	Michigan	Passenger
	$12,104.55		
Factor 9-1		$10,421.98	
Factor 9-3			$ 3,015.64

Assignment of Passenger to Services.

Passenger & Baggage	Factor	9-12	$ 1,607.07
Sleepers	"	9-12	723.59
Diners	"	9-12	312.70
Mail & Express	"	9-12	372.28

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account
411 OTHER EXPENSES.

	System	Michigan	Passenger
Located	$ 1,213.59	$ 997.02	
	Freight	Passenger	Common
Michigan located	$ 787.45	$ 15.59	$ 193.98
Com. Factor 9-3		55.60	
Total Passenger		$ 71.19	

Assignment of Passenger to Services.

Passenger & Baggage	Factor 9-12	$ 37.94
Sleepers	" 9-12	17.08
Diners	" 9-12	7.38
Mail & Express	" 9-12	8.79

Account
412 OPERATING JT. TRACKS & FAC. DR.

	System	Michigan	Passenger
Located	$ 4,501.51	$ 1,083.37	
Located Com. 68.03			$ 75.98
$64.52 on acct. 373 Stations			10.69
3.51 " spl. 5.24% crossing gates			.18
Total Passenger			86.85

Assignment of Passenger to Services, only 10.87 to be located balance all Passenger & Baggage.

Passenger & Baggage	Acct. 373	$ 9.17
Sleepers	" "	.61
Mail & Express	" "	1.09

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account 413 OPERATING JT. TRACKS & FAC. CR.

	System	Michigan	
Located M.A.Co.	$ 4,927.98	$ 3,477.96	
	Freight	Common	Passenger
Michigan	$ 2,078.11	$ 645.28	$ 754.57
Com. Water Factor 5-c		183.45	55.87
" Stations Accts. 373		461.83	76.56
		Total Passenger	887.00

Owing to clerical error was brought into passgr. acct. as $887.60

Assignment of passenger to Services.

$55.87 on Factor 17-28		$831.13 on Acct. 373
Passenger & Baggage	25.30	$ 694.52
Sleepers	14.61	53.49
Diners	7.80	
Mail & Express	8.16	83.12

Account 414 INSURANCE.

	System	Michigan		Michigan
Located	$ 1,827.22	$ 1,443.09	less coal.%	$ 1,379.46
	Freight	Common		Passenger
Mich.	$ 833.60	$ 478.50		$ 67.36
Com. Coal		355.17	Factor 5-D	110.86
" other		123.33	" 9-3	35.35
				213.57

Assignment of passenger to Services.

Passenger & Baggage	Acct. 373	$ 178.21
Sleepers	" 373	14.00
Mail & Express	" 373	21.36

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account
416 DAMAGE TO PROPERTY.

		System	Michigan
Located		$ 599.17	$ 593.67
	Freight	Common	
Locate	$ 382.12		
"	211.55	Factor 11-J	97.10

Assignment of Passenger to Services.

Passenger & Baggage	Factor	9-12	$ 51.75
Sleepers	"	9-12	23.30
Diners	"	9-12	10.07
Mail & Express	"	9-12	11.98

Account
415 CLEARING WRECKS.

	System	Michigan
Located Freight	$ 896.94	$ 794.50
" Passenger	254.47	270.12

Assignment of Passenger to Services.

Passenger & Baggage	Factor	18-11	$ 147.47
Sleepers	"	18-11	54.06
Diners	"	18-11	27.54
Mail & Express	"	18-11	41.05

Account
417 DAMAGE TO STOCK ON RIGHT OF WAY.

	System	Michigan	Passenger
Located	$ 422.10	$ 399.90	$ 324.32

In locating passgr. $3.05 Com. was split to Pasagr. and Frt. in located

Assignment of Passenger to Services.

Passenger & Baggage	Factor	18-14	$ 180.70
Sleepers	"	18-14	63.47
Diners	"	18-14	32.14
Mail & Express	"	18-14	48.01

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account 418 LOSS & DAMAGE—FREIGHT.

	System	Michigan
Located by Ry.	$ 6,971.01	$ 5,773.19

Account 419 LOSS & DAMAGE—BAGGAGE.

	System	Michigan
Located	$ 154.73	$ 137.52

Account 420 INJURIES TO PERSONS.

	System	Michigan	
	$10,618.27		
Located		$ 6,916.06	
	Freight	Common	Passenger
Michigan Located	$ 4,404.24	$ 937.60	$ 1,574.22
Com. on located			246.88
Total Passenger			1,821.10

Assignment of Passenger to Services.

Passenger & Baggage	Factor 9-12	$ 970.48
Sleepers	" 9-12	436.97
Diners	" 9-12	188.83
Mail & Express	" 9-12	224.82

Account 441 DINING & BUFFET SERVICES.

	System	Michigan
Company's figures	$43,983.68	$35,899.48

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account
451 SALARIES & EXPENSES—GENERAL OFFICERS.

	System	Michigan	
	$25,342.04		
Factor 12-6		$21,405.28	
" 12-15			$ 6,278.40

Assignment of Accts. 451 to 459 omitting 454.
Passenger to Services.

Passenger & Baggage	Factor	12-15	$12,334.36
Sleepers	"	12-15	4,945.14
Diners	"	12-15	3,942.32
Mail & Express	"	12-15	2,828.79

Account
452 SALARIES—GEN'L OFFICERS, CLERKS & OTHERS.

			System	Michigan		
			$37,898.07			
Factor 12-6				$32,010.79		
Delfs location	17.52%	Passgr.				$ 5,608.29
" "	31.88%	Frt.				
" "	50.60%	Com.			Factor 12-15	4,730.89
						10,359.18

To services see 451.

Account
453 GENERAL OPS. EXPENSE & SUPPLIES.

	System	Michigan	Passenger
	$ 4,070.11		
Factor 12-6		$ 3,437.84	
Michigan Located to Frt.	113.01		
Balance	3,324.83	Factor 12-15	975.21

To Services see Acct. 451.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account
454 LAW EXPENSES—other than suit.

		System	Michigan	
		$10,230.34		
Located	Freight		$ 210.44	
"	Passgr.		685.59	685.59
"	Mail & Express		230.90	230.90
"	Com.		188.77	
Factor 12-6		8,855.59	7,479.92	2,249.31
			8,795.62	3,165.80

Assignment of Passenger to Services.

2,934.90	Passenger & Baggage	Factor 12-15	$ 1,505.16
	Sleepers	" 12-15	603.46
	Diners	" 12-15	481.08
	Mail & Express	" 12-15	345.20
230.90	Sleeper Direct	" 12-15	230.90

Account
455 INSURANCE.

	System	Michigan	Passenger
	$ 143.18		
Factor 12-6		$ 120.94	
" 12-15			$ 33.47

To Services see Acct. 451.

Account
456 PENSIONS.

	System	Michigan	
	$ 4,020.00		
Factor 12-6		$ 3,395.51	
" 12-15			$ 995.94

To Services see Acct. 451.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Distribution of Operating Expenses (Continued).

Account 458 STATIONERY & PRINTING.

	System	Michigan	Passenger
	$ 5,005.21		
Factor 12-6		$ 4,227.68	
" 12-16			$ 1,240.03

To Services see Acct. 451.

Account 459 VALUATION EXPENSES.

	System	Michigan	Passenger
	$12,034.37		
Track miles 83.18 (Co's figures)		$10,010.19	
Factor 12-6			$ 2,936.10

To Services see Acct. 451.

Account 460 OTHER EXPENSES.

	System	Michigan	
	$ 4,755.75		
Located Mich.		$ 1,276.63	
Located Wis. 16.60			
" Com. Factor 12-6	3,462.52	2,924.63	
		4,201.26	
Factor 12-15			$ 1,232.28

To Services see Acct. 451.

Account 461 GENERAL JT. FACILITIES.

	System	Michigan	Passenger
Located	$ 455.42	$ 61.81	$ 17.11

All Passenger & Baggage.

Duluth, South Shore & Atlantic Railway Company.

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services.
Year ending June 30th, 1916.

	A-System	B-Total Michigan	C-Michigan Passenger	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
I. MAINTENANCE OF WAY AND STRUCTURES.								
201. Superintendence	24,650.94	20,511.01	5,539.59		2,581.43	1,412.54	746.89	798.73
202. Road Maintenance	67,951.15							
a—Care of Roadbed		9,060.61						
b—General Cleaning		20,355.17						
c—Watching Roadway		21,592.93						
d—Bank Protection		1,457.85						
e—Train Service		5,159.07						
f—Track Changes		366.26						
Total Roadway Maintenance		57,991.88	26,871.41		12,396.70	6,920.70	3,669.61	3,284.40
208. Bridges, Trestles and Culverts	60,062.16	45,887.33	11,976.12		5,524.99	3,084.44	1,635.48	1,731.21
212. Ties	70,021.27	56,379.05	13,017.08		6,005.22	3,353.54	1,777.64	1,881.68
214. Rails	5,433.07	4,660.93	1,076.14		496.46	277.16	146.96	155.56
216. Other Track Material	23,218.15	20,097.14	4,640.13		2,140.65	1,195.06	633.67	670.75
218. Ballast	3,035.05	2,975.60	687.02		316.95	176.94	93.82	99.31
220. Track Laying and Surfacing	180,248.86							
a—Applying Ballast		6,315.26						
b—Applying Ties		35,571.24						
c—Applying Rails		5,100.24						
d—Applying Other Track Material		1,407.08						
e—Track Maintenance		94,759.29						
f—Train Service		2,653.75						
g—Track Changes		805.93						
Total Track Laying and Surfacing		145,612.78	33,619.81		15,509.96	8,658.75	4,591.19	4,859.91

THIS PAGE BOUND VERTICAL IN BOOK

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. (Continued.)

Year ending June 30th, 1916.

	A-System	B-Total Michigan	C-Michigan Passenger	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
MAINTENANCE OF WAY AND STRUCTURES—(Continued).								
221. Right of Way Fences	6,928.08	6,081.34	2,437.23		1,124.38	627.71	332.83	353.31
222. Snow, Sand Fences and Snow Sheds	432.31	198.16	79.42		36.64	20.45	10.85	11.48
225. Crossings and Signs	1,666.78	904.27	312.87		144.34	80.58	42.73	45.22
227. Station and Office Buildings	9,723.78							
a—Station Buildings and Grounds		7,810.84	1,454.32		1,213.54	95.35		146.43
b—Office Buildings and Grounds		64.98	18.62		9.55	3.83	3.06	2.19
c—Track Scales		1,142.75						
229. Roadway Buildings	2,570.61	2,514.69	672.28		313.28	171.42	90.64	96.94
231. Water Stations	8,284.06	7,016.04	2,136.76		967.44	553.85	298.45	312.02
233. Fuel Stations	2,435.96	2,065.85	644.83		291.95	168.65	90.07	94.16
235. Shops and Engine Houses	20,314.27	18,748.74						
a—Shops			256.86		140.22	46.33	29.02	41.29
b—Engine Houses			5,655.18		2,560.44	1,479.05	789.38	825.81
241. Wharves and Docks								
a—St. Ignace Mdse. and Slip Dock	1,315.53	1,315.53	131.30		70.80	29.28	14.16	17.06
b—Marquette Mdse. Dock	123.70	123.70						
243. Coal and Ore Wharves								
a—Marquette Ore Dock	12,688.13	12,688.13						
244. Coal and Ore Wharves—Depreciation	19,145.88	19,145.88						
247. Telegraph and Telephone Lines	3,487.05	3,032.11	869.01		439.10	197.83	103.00	129.08
249. Signals and Interlockers	279.16	177.81	9.32		4.30	2.40	1.27	1.35
265. Miscellaneous Structures	140.25	140.25	37.88		17.65	9.66	5.11	5.46
269. Roadway Machines	1,776.27	1,466.25	396.00		184.53	100.98	53.39	57.10
271 Small Tools and Supplies	6,416.03	5,338.51	1,441.82		671.88	367.65	194.40	207.89
272. Removing Snow, Sand and Ice	42,979.90	38,074.55	11,062.20		5,107.05	2,844.64	1,508.34	1,603.17

THIS PAGE
VERTICAL

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. (Continued.)

Year ending June 30th, 1916.

	A-System	B-Total Michigan	C-Michigan Passenger	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
MAINTENANCE OF WAYS AND STRUCTURES—(Continued).								
274. Injuries to Persons	1,407.24	822.74	196.16		91.41	50.02	26.45	28.28
275. Insurance	4,298.73	3,790.02	801.03		409.72	185.52	94.66	111.13
276. Stationery and Printing	1,109.13	922.86	249.25		116.15	63.56	33.61	35.93
277. Other Expenses	243.89	202.93	54.81		25.54	13.98	7.39	7.90
278. Maint. Jt. Tks. Yds. and Other Facil. Dr.	13,434.23	8,402.40	866.97		473.33	173.51	88.37	131.76
279. Maint. Jt. Tks. Yds. and Other Facil. Cr.	*13,818.15	*13,818.15	*5,551.75		*2,572.45	*1,423.99	*754.04	*801.37
Total Maintenance of Way and Structures	582,103.47	482,488.90	121,659.67		56,813.15	30,945.38	16,358.90	17,542.24
*Deduct.								
11. MAINTENANCE OF EQUIPMENT.								
301. Superintendence	12,673.28	10,766.14	3,011.15	130.47	1,572.48	519.52	325.57	463.11
302. Shop Machinery	8,783.82	7,461.99	2,087.02		1,139.24	376.39	235.87	335.52
308. Steam Locomotives—Repairs	102,988.84							
a—Freight		43,071.71						
b—Passenger		30,806.32	30,806.32	1,523.41	13,258.13	7,658.62	4,090.06	4,276.10
c—Switch		13,954.59	354.45		157.45	118.35	60.97	17.68
309. Steam Locomotives—Depreciation	23,011.84							
a—Freight		10,524.92						
b—Passenger		5,866.51	5,866.51	325.28	2,508.85	1,449.25	773.96	809.17
c—Switch		3,262.78	82.87		36.81	27.67	14.25	4.14

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. (Continued.)

Year ending June 30th, 1916.

	A-System	B-Total Michigan	C-Michigan Passenger	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
MAINTENANCE OF EQUIPMENT								
310. Steam Locomotives—Retirements								
a—Freight	*257.42	*50.22						
b—Passenger	1,138.93	23.21	23.21	1.19	9.97	5.76	3.08	3.21
c—Switch	*49.78	835.90	21.23		5.43	7.09	3.65	1.06
314. Freight Train Cars—Repairs	139,181.15	119,806.20						
315. Freight Train Cars—Depreciation	60,752.00	52,291.86						
316. Freight Train Cars—Retirements	4,348.56	3,742.18						
317. Passenger Train Cars—Repairs	46,155.29	37,456.56	37,456.56	1,596.09	22,424.27	3,977.79	3,238.24	6,220.17
318. Passenger Train Cars—Depreciation	12,366.74	9,952.82	9,952.82	314.54	4,419.11	1,957.18	2,036.19	1,225.80
326. Work Equipment—Repairs	6,599.40	5,447.59	1,456.36		672.44	374.67	198.64	210.61
327. Work Equipment—Depreciation	3,483.31	2,876.37	768.76		354.93	197.76	104.84	111.17
328. Work Equipment—Retirements	*8.19	*6.76	* 1.81		* .84	* .47	* .24	* .36
332. Injuries to Persons	4,325.16	3,710.66	128.79		70.30	23.23	14.56	20.70
333. Insurance	2,417.19	2,074.61	492.12		234.95	102.04	87.23	67.90
334. Stationery and Printing	1,316.23	1,119.13	285.75		155.99	51.53	32.29	45.94
336. Maint. Jt. Equipment at Terminals Dr.	792.37	14.69	6.66		3.64	1.20	.75	1.07
337. Maint. Jt. Equipment at Terminals Cr.								
Total Maintenance of Equipment	430,018.83	365,008.76	92,798.71	3,890.98	47,027.15	16,847.58	11,219.91	13,813.09

*Deduct

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. (Continued.)

Year ending June 30th, 1916.

	A-System	B-Total Michigan	C-Michigan Passenger	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
III. TRAFFIC EXPENSES.								
351. Superintendence	$31,604.38	$26,123.17	$11,580.91		$11,580.91			
352. Outside Agencies	35,099.56	29,004.50	14,210.80		14,210.80			
353. Advertising	4,078.18	3,362.69	3,319.24		3,319.24			
354. Traffic Associations	277.69	229.94						
355. Fast Freight Lines	*9.81	*8.13						
356. Industrial and Immigration Bureaus	8,463.90	7,476.46	2,205.79		2,205.79			
357. Insurance	113.28	59.00	59.00		59.00			
358. Stationery and Printing	9,384.71	7,758.25	3,138.52		3,138.52			
Total Traffic Expenses	89,011.89	74,005.88	34,514.26		34,514.26			
*Deduct								
IV. TRANSPORTATION EXPENSES.								
371. Superintendence	20,755.37	17,852.13	5,116.49	213.33	2,612.95	1,176.49	508.42	605.30
372. Dispatching Trains	12,804.19	10,815.07	2,374.77		1,095.57	611.62	324.30	343.28
373. Station Employes	159,423.40	141,572.25	23,469.81		19,584.15	1,538.68		2,346.98
374. Weighing, Inspection and Demurrage Bureaus	2,032.91	1,683.17						
375. Coal and Ore Wharves	25,323.00	25,323.00						
376. Station Supplies and Expenses	10,710.44	9,750.85	2,239.00		2,239.00			
377. Yard Masters and Yard Clerks	4,743.15	4,743.15						
378. Yard Conductors and Brakemen	48,035.57	46,858.32						
379. Yard Switch and Signal Tenders	4,209.46	4,197.56						
380. Yard Enginemen	34,640.32	33,644.90						

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. (Continued.)

Year ending June 30th, 1916.

		A-System	B-Total Michigan	C-Michigan Passenger	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
TRANSPORTATION EXPENSES CONTINUED—(Continued).									
383.	Fuel for Yard Locomotives	29,504.04	28,288.85						
385.	Water for Yard Locomotives	1,821.03	1,730.61						
386.	Lubricants for Yard Locomotives	581.04	568.60						
387.	Other Supplies for Yard Locomotives	433.30	425.58						
388.	Engine House Expenses—Yard	15,813.64	15,453.82						
389.	Yard Supplies and Expenses	1,386.66	1,360.47						
	Total Accts. 377 to 389, inclusive		137,306.86	3,411.27		1,515.29	1,139.02	586.74	170.22
390.	Operating Jt. Yards and Terminals Dr.	25,994.44	17,212.24	6,199.24		3,303.65	1,487.48	642.81	765.30
391.	Operating Jt. Yards and Terminals Cr.	*13,476.76	*13,476.76	*1,747.69		*931.36	*419.35	*181.22	*215.76
392.	Train Enginemen	174,317.09							
	a—Freight		84,885.24						
	b—Passenger		60,563.08	60,563.08	3,182.20	25,979.77	15,007.34	8,014.62	8,379.15
394.	Fuel for Train Locomotives	301,342.42							
	a—Freight		163,186.06						
	b—Passenger		86,134.91	86,134.91	4,547.98	36,939.34	21,338.19	11,395.59	11,913.91
	c—Mixed		1,583.79	251.98		114.09	65.90	35.20	36.79
	d—Special		354.76	154.87		70.12	40.50	21.63	22.62
397.	Water for Train Locomotives	14,253.67	11,968.10	4,122.19	216.63	1,768.28	1,021.46	545.51	570.31
398.	Lubricants for Train Locomotives	5,614.91	4,681.72	1,612.52	84.74	691.72	399.57	213.39	223.10
399.	Other Supplies for Train Locomotives	2,666.58	2,232.18	767.02	27.79	334.69	193.34	103.25	107.96
400.	Engine House Expenses—Train	45,258.80	39,328.78	16,400.10		7,425.31	4,289.27	2,290.67	2,394.85
401.	Trainmen	201,768.63							
	a—Freight Service		115,088.28						
	b—Passenger Service		52,680.79	52,680.79	2,833.68	37,240.79	5,556.76	2,830.63	4,219.53

THIS PAGE

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. (Continued.)

Year ending June 30th, 1916.

	A-System	B-Total Michigan	C-Michigan Passenger	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
TRANSPORTATION EXPENSES CONTINUED—(Continued).								
402. Train Supplies and Expenses	$34,399.20							
a—Freight—Lubricating Cars		$3,464.47						
b—Freight—Miscellaneous		3,124.87						
c—Passenger—Cleaning and Lubricating		12,510.73	$12,510.73	$675.53	$6,461.37	$2,368.63	$1,206.58	$1,798.62
d—Passenger—Miscellaneous		9,696.90	9,696.90	525.43	5,007.12	1,835.53	935.02	1,393.80
403. Operating Sleeping Cars	13,964.15	10,566.08	10,566.08			10,566.08		
404. Signal and Interlocker Operation	1,539.84	311.34	16.31		9.09	3.19	1.62	2.41
405. Crossing Protection	8,639.47	8,159.47	427.56		238.22	83.68	42.37	63.29
407 Telegram and Telephone Operation	174.47	174.47	50.00		26.65	12.00	5.18	6.17
410 Stationery and Printing	12,104.55	10,421.98	3,015.64		1,607.07	723.59	312.70	372.28
411. Other Expenses	1,213.59	997.02	71.19		37.94	17.03	7.38	8.79
412. Operating Jt. Tks. and Facilities	Dr. 4,501.51	1,083.37	86.85		85.15	.61		1.09
413. Operating Jt. Tks. and Facilities	Cr. *4,927.98	*3,477.96	*887.60		*720.32	* 68.14	* 7.80	* 91.34
414. Insurance	1,827.22	1,379.46	213.57		178.21	14.00		21.36
415. Clearing Wrecks	1,151.41							
a—Freight		794.50						
b—Passenger		270.12	270.12		147.47	54.06	27.54	41.05
416. Damage to Property	599.17	593.67	97.10		51.75	23.30	10.07	11.98
417. Damage to Live Stock on Right of Way	422.10	399.90	324.32		180.70	63.47	32.14	48.01
418. Loss and Damage—Freight	6,971.01	5,773.19						
419. Loss and Damage—Baggage	154.73	137.52	137.52		137.52			
420. Injuries to Persons	10,618.27	6,916.02	1,821.10		970.48	436.97	188.83	224.82
Total Transportation Expenses	1,223,400.01	1,044,022.69	302,167.74	12,306.61	154,401.78	69,580.32	30,093.17	35,785.86

*Deduct

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. (Continued.)

Year ending June 30th, 1916.

	A-System	B-Total Michigan	C-Michigan Passenger	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
VI. MISCELLANEOUS OPERATIONS.								
441. Dining and Buffet Service	$43,983.68	$35,899.48	$35,899.48				$35,899.48	
Total, Miscellaneous Operation	43,983.68	35,899.48	35,899.48				35,899.48	
VII. GENERAL EXPENSES.								
451. Salaries and Expenses—Gen'l Officers	35,342.04	21,405.28	6,278.40					
452. Salaries and Expenses—Clerks and Attendants	87,896.07	32,010.79	10,359.18					
453. General Office Supplies and Expenses	4,070.11	3,437.84	975.21					
456. Insurance	143.18	120.94	33.47					
457. Pensions	4,020.00	3,395.51	995.94					
458. Stationery and Printing	5,005.21	4,227.68	1,240.03					
459. Valuation Expenses	12,034.37	10,010.19	2,936.10					
460. Other Expenses	4,755.75	4,201.26	1,232.28		12,324.26	4,945.14	3,942.32	3,338.79
454. Law Expenses								
a—This Suit	9,676.14							
b—Other Expenses	10,230.34	8,795.63	3,185.80		1,505.16	603.46	481.08	576.10
461. General Joint Facilities	Dr. 455.42	61.61	17.11		17.11			
Total General Expenses	113,630.63	87,666.92	27,233.52		13,856.63	5,548.60	4,423.40	3,404.89
Grand Total, Operating Expenses	2,483,148.51	2,099,692.63	614,273.38	16,197.59	306,612.97	122,921.88	97,994.86	70,546.08

THIS PAGE E

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Expenses.
Year ending June 30th, 1916.

	System	Total Michigan	Michigan Passenger	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express
Grand Total OPERATING EXPENSES	$2,462,148.51	$2,099,092.63	$614,273.33	$ 16,197.59	$306,612.97	$122,921.38	$ 97,994.86	$ 70,546.08
Deduct account use of Factor 11-D instead of Factor 16-B on Acct. 202.			5,373.59		2,478.56	1,283.70	733.69	777.64
Deduct account reduction above will make on account No. 201.			229.64		105.92	59.13	31.36	32.23
Corrected Operating Figures	$2,462,148.51	$2,099,092.63	$608,670.15	$ 16,197.59	$304,028.49	$121,479.05	$ 97,229.81	$ 69,736.21
The above deductions would affect MAINTENANCE OF WAY AND STRUCTURES total as follows	$ 582,103.47	$ 482,488.90	$121,659.67		$ 56,813.15	$ 30,945.28	$ 16,358.90	$ 17,542.24
Deductions			5,603.23		2,584.48	1,442.53	765.05	810.87
Corrected Figures MAINTENANCE OF WAY AND STRUCTURES	$ 582,103.47	$ 482,488.90	$116,056.44		$ 54,228.67	$ 29,502.55	$ 15,593.85	$ 16,731.37

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Assignment of Passenger and Baggage Expenses to INTER and INTRA.
Year ending June 30th, 1916.

	Total Passenger & Baggage		Inter	Intra
I. MAINTENANCE OF WAY AND STRUCTURES	$ 54,228.67			
Account 227-A Station Buildings	1,213.54	on Intra Factor 1	$ 151.09	$ 1,062.45
Overheads, 201, 229, 265, 269, 271, 275, (in part $51.33) 276 277, 278, 279	1,866.56	on Intra Factor 3	466.50	1,400.06
All other accounts	51,148.57	on Intra Factor 2	14,932.72	36,215.85
II. MAINTENANCE OF EQUIPMENT	47,027.15	on Intra Factor 2	13,729.48	33,297.67
III. TRAFFIC EXPENSES	34,514.26			
Account 352, Outside Agencies	14,210.80	on Intra Factor 4-A	13,078.20	1,132.60
Account 353, Advertising	3,319.24	on Intra Factor 4-B	2,292.27	1,026.97
Accounts 356-358	5,403.31	on Intra Factor 2	1,577.49	3,825.82
Account 361, Superintendence	11,580.90	on Intra Factor 5	8,568.83	3,012.08
IV. TRANSPORTATION EXPENSES	154,401.78			
Accounts 373 and 376, Stations	21,823.15	on Intra Factor 1	2,716.98	19,106.17
Overheads, 371, 390, 391, 407, 410, 411, 412, 413	6,021.73	on Intra Factor 6	1,609.73	4,412.00
All other accounts	126,556.90	on Intra Factor 2	36,948.03	89,608.87
VII. GENERAL EXPENSES	13,856.63	on Intra Factor 7	4,587.71	9,268.92
			100,659.03	203,369.46
Deduct expenses located to INTER from INTRA and add them to INTER				
Account 278, $262.12; Factor 18-11			143.10	* 143.10
Account 412, $85.15; All			85.15	* 85.15
*Deduct.			$100,887.28	$203,141.31

THIS PAGE BOUND WITH VERTICAL IN

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Earnings.

Year ending June 30th, 1916.

		System	Total	Freight	Mineral Range	MICHIGAN PASSENGER				
						Total	Sleepers & Diners	Mail & Express	PASSENGER & BAGGAGE Total	Interstate	Intrastate
101.	Freight	$2,316,447.79	$2,067,558.74	$2,067,558.74							
102.	Passenger	890,511.40	770,755.19			$770,755.19	$	$	$770,755.19	$226,573.70	$544,181.49
103.	Excess Baggage	8,191.98	7,482.33			7,482.33			7,482.33	2,861.54	4,620.79
104.	Sleeping Cars	39,450.13	30,390.46			30,390.46	30,390.46				
105.	Parlor & Chair Cars	4,488.65	4,488.65			4,488.65	4,488.65				
106.	Mail	72,758.33	58,203.34			58,203.34		58,203.34			
107.	Express	30,577.67	27,817.90			27,817.90		27,817.90			
108.	Other Pass. Trns	1,134.04	905.98			905.98			905.98	300.41	605.57
109.	Milk	511.87	100.71			100.71			100.71		100.71
110.	Switching	21,869.69	12,234.63	12,234.63							
111.	Spl. Service Trn	5,263.24	3,969.01	2,356.88		1,612.13			1,612.13	32.90	1,579.23
112.	Other Frt. Trns	61.90	61.90	61.90							
131.	Dining & Buffet	35,240.77	27,938.97			27,938.97	27,938.97				
133.	Sta. & Trn. Priv.	600.00	494.52			494.52			494.52	145.39	349.13
134.	Parcel Room	522.55	522.55			522.55			522.55	153.63	368.92
135.	Storage-Freight	981.46	935.53	935.53							
136.	Storage-Baggage	82.10	82.10			82.10			82.10	24.14	57.96
137.	Demurrage	6,317.00	5,920.15	5,920.15							
138.	Teleg. & Telep.	612.54	579.16	397.82		181.33			181.33	53.31	128.02
142.	Rents, Bldg. & Others	6,660.68	6,575.33	6,044.57		530.76			530.76	156.04	374.72
143.	Miscellaneous	56,334.45	56,148.13	55,471.10		677.03			677.03	199.05	477.98
151.	Jt. Facil, Cr.	7,651.62	2,644.62	1,412.25		1,232.37			1,232.37	517.18	715.19
152.	Jt. Facil, Dr.	*396.64	*396.64	*276.43		*120.21			*120.21	* 35.24	* 84.97
	Total	$3,505,873.22	$3,085,413.26	$3,152,117.15		$933,296.11	$62,818.08	$86,021.24	$784,456.79	$230,381.95	$553,474.84

*Deduct.

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Income Account down to Net Returns applicable to return on Investment. Passenger business State of Michigan.
Year ending June 30th, 1916.

Item No. and Class.	Mineral Range Run	Total D. S. S. & A. Pass.	D. S. S. & A. Ry.—PASSENGER Sleepers	Diners	Mail & Express	Passenger & Baggage	Passenger & Baggage Interstate	Passenger & Baggage Intrastate
1. Earnings	$	$923,296.20	$ 24,879.11	$27,938.97	$86,021.33	$784,456.79	$230,981.95	$553,474.84
2. Expenses	16,197.59	592,472.56	121,479.05	97,229.81	69,735.21	304,028.49	100,887.28	203,141.21
3. Net Income	*16,197.59	340,823.64	* 86,599.94	*69,290.84	16,286.12	480,428.30	130,094.67	350,333.63
4. Rent Tracks, Ishpeming to Marquette, C. & N. W. Ry., $1,050.02								
5. Rent Tracks, Negaunee to Calumet, C. & N. W. Ry., $6,546.82	994.02							
6. Rent, Champion to Calumet, C. M. & St. P. Ry., $4,117.50	$ 739.04	9,981.28	1,861.51	980.16	1,150.84	5,988.77	1,760.48	4,228.29
8. Rent, Michigamme to Beaufort, $2,150.98 on Factor 1-10								
8. Rent, Houghton to Pilgrim, $3,457.77 on Factor 1-10								
9. Union Dep. Tracks, Negaunee, $57.00 on Factor 1-10								
$5,665.75 on Factor 1-10								
10. Land, Negaunee Depot	†	1,514.68	396.15	211.57	221.18	685.78	201.59	484.19
		150.00				150.00	44.10	105.90
	*14,464.53	352,469.60	* 84,342.28	*68,099.11	17,658.14	487,252.85	132,100.84	355,153.01
11. Hire of Equipment, Locomotives	†	2,135.21	558.44	298.23	311.80	966.74	284.19	682.55
12. Hire of Equipment, Pass. Cars	‡	*252.62	* 47.85	* 24.25	* 38.63	* 141.85	* 38.90	* 102.95
13. Hire of Equipment, Sleepers		*1,113.45	* 1,113.45					
14. Hire of Equipment, Sundry		15.25						
15. Hire of Equipment, Work $216.08		63.38	16.17	12.89	9.25	40.32	11.85	28.47
		353,317.47	* 84,929.01	*67,812.24	17,940.66	488,118.06	132,357.98	355,760.08

THIS PAGE E
VERTICAL II

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Income Account down to Net Returns applicable to return on Investment. Passenger business State of Michigan.

Item No. and Class.		Mineral Range Run	Total D. S. S. & A. Pass.	D. S. S. & A. Ry.—PASSENGER Sleepers	Diners	Mail & Express	Passenger & Baggage	Passenger & Baggage Interstate	Passenger & Baggage Intrastate
16. Taxes, Michigan, Sleepers, Etc.			* 258.73	* 257.73					
Taxes, Michigan, Other	$233,049.35								
Taxes, Michigan, Passg'r.	67,576.85	*1,798.29	*65,778.56	* 13,487.12	*10,794.79	* 7,742.28	*33,754.37	*11,200.87	*22,553.50
		*16,262.82	237,280.18	* 98,674.86	*78,607.03	10,198.38	454,363.69	121,157.11	333,206.58

* Deficit.

Interest $3,999.19 and other returns on property not used for transportation purposes left for final adjudication, as interest contains sums accrued on the trust fund for redemption of fare in excess of 2¢ per mile.

Taxes on expense basis.

§ One-half on account 392, one-half on account 401, Intra on earnings, 70.6037%.
† To services on Factor 17-28, Intra on earnings.
‡ To services on Factor 18-18, Intra on earnings.
‖ To services on Factor 12-20, Intra on earnings.
•• To Passenger Factor 12-15.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Percentages of Maintenance of Way and Structures Accounts.

Less account 244—Depreciation.

			Michigan	
Accounts 202 to 225 241 to 267 and 272		$507,728.26	78.8723%	2
		643,798.36		
All accounts excepting 201, 244, 276, 277, 278, 279		$573,630.17		
		704,053.84	81.4753%	5
			Passenger	
Accounts 202 to 225 241 to 267 and 272	Passenger	$117,631.04	23.1680%	7
	Michigan	507,728.26		
All accounts excepting 201, 244, 275, 276, 277, 278, 279, 267, 269 and 229		$123,901.60	22.6657%	10
		555,471.36		
Accounts 202 to 225, 247 to 265 and 272				
Passenger & Baggage		$ 55,908.79	47.9828%	
Sleepers		29,742.68	25.5262%	
Diners		14,483.03	12.4298%	
Mail & Express		16,383.96	14.0612%	17
Accounts 202 to 272, excepting 227-B, 229, 265, 269 and 271				
Passenger & Baggage		$ 60,558.95	48.7225%	
Sleepers		31,169.41	25.0772%	
Diners		15,188.21	12.2196%	
Mail & Express		17,377.06	13.9807%	20

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Percentages in Maintenance of Equipment.

	System	Michigan		
Repair accounts	$352,571.82	$297,918.09	84.4986%	1
Accts. 202 to 228	470,185.49	397,283.95	84.4952%	2
	Michigan	Passenger		
Repair accounts	$297,918.09	$ 85,350.78	28.6491%	5
Accts.				
	Passenger	Mineral Range		
Repair accounts	$ 85,350.78	$ 3,787.14	4.4371%	7

Accounts 308, 317 and 326.

Passenger & Baggage	$45,458.83	55.7342%	
Sleepers	14,834.01	18.1871%	
Diners	8,488.65	10.4074%	
Mail & Express	12,782.15	15.6713%	16

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Factor for Assignment of Engine House Repairs.

		Michigan	Passenger		
Account	400	$48,306.09	$18,363.80		
	388	17,976.64	376.14		
		66,282.73	18,739.94	28.2727%	6

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

A—Fuel Accounts in Transportation Expenses.

B—Water Accounts in Transportation Expenses.

		System	Michigan	
A	Account 382	$ 44,126.21	$ 40,214.37	
	" 394	440,586.64	369,004.73	
		484,712.85	409,219.10	84.4251%
B	Account 385	1,217,68	936.28	
	" 397	17,175.85	14,375.31	
		18,393.53	15,311.59	83.2445%
		Michigan	Passenger	
C	Account 382	40,214.37	1,067.70	
	" 394	369,004.73	120,251.96	
		409,219.10	121,319.66	29.6466%
D	Account 385	936.28	25.78	
	" 397	14,375.31	4,688.71	
		15,311.59	4,714.49	30.7903%

Duluth South Shore & Atlantic Railway.

Engine Miles—Road.

	—System—			—Michigan—			
	Total	Freight	Passenger	Total	Freight	Passenger	
Freight	1,115,897	1,115,897		927,702	927,702		1
Passenger	941,753		941,753	780,592		780,592	2
Mixed	17,072	14,684	2,388	17,072	14,684	2,388	3
Spl. Pass.	610		610	425		425	4
Spl. Mixed	1,507	1,231	276	1,443	1,231	230	5
Road Swi.	169,258	167,044	2,214	147,704	145,490	2,214	6
M. R. R. R.	43,810		43,810	43,810		43,810	7
	2,289,907	1,298,856	991,051	1,918,748	1,089,089	829,659	8

6—A All road loco miles to Michigan
1,918,748 83.7915%
2,289,907

6—B All Pass. road loco miles in Michigan
829,669 43.2396%
1,918,746

6—C All Frt. loco miles to Michigan
1,089,089 83.8500%
1,298,856

6—D All Pass. loco miles to Michigan
829,659 83.7151%
991,051

6—E Pass. train loco miles to Michigan
780,592 82.8871%
941,753

6—F Frt. road and Rd. Swi. miles to Mich.
1,073,192 83.7147%
1,282,441

6—G Spl. loco miles to Michigan
1,868 88.2381%
2,117

6—H Passenger road and Rd. Switch
826,616 83.6845%
987,777

6—I Freight, excluding Road Switch
927,702 83.1351%
1,115,897

6—K Pass. including Road Switch
782,806 82.9273%
943,967

6—L Spl. train miles to Michigan
425 22.7516%
230 12.3126%
1,868

6—M Freight, excluding Mixed
1,074,405 83.6652%
1,284,172

6—N Pass.
M. R. 43,810 4.6367%
783,461 82.9188%
944,853

27.15% Passenger on Special Mixed.
13.99% Passenger in Mixed (Based on car miles).

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Passenger Car Miles.

Does not include D. S. S. & A. Sleepers.

	System		Michigan		
	Passenger Coaches	Other Pass. Cars	Passenger Coaches	Other Pass. Cars	
D. S. S. & A. coaches	1,886,337		1,573,536		1
Mail, Exp. & Bag.		864,285		706,474	2
Foreign Diners		49,021		48,982	3
D.S.S.&A. Diners		350,040		292,963	4
C&NW and CM&StP cars in DSS&A trains	207,558	153,481	207,558	153,481	5
	2,093,895	1,416,827	1,781,094	1,201,900	6
DSSA cars on M.R.R.R.	63,873	50,094	63,873	50,094	7
	2,157,768	1,466,921	1,844,967	1,251,994	8
For Sleepers, Diners & Obs.		210,541		209,334	9
D.S.S.&A. Sleepers		683,525		516,110	10
Pass. Cars on C.&N.W. and C.,M.&St.P. trains	67,459	30,056	67,459	30,056	11
Do Sleepers		4,380		4,380	
	2,225,227	2,395,423	1,912,426	2,011,874	12
M.R.R.R. paid for	*4,319		4,319		13
	2,220,908	2,395,423	1,908,107	2,011,874	14

7-A Cars on which the D.S.S.&A. make repairs.

		To Michigan	
Mineral Range	113,967	3.9785%	
Lines 1, 2, 7, 13	2,280,010	79.5929%	15
	2,864,589		
	3,924,300	84.9296%	
7-B Line 12	4,620,650		
7-C Lines 1 to 10, less 13, Mineral Range	113,967	2.5245%	
	3,704,119	82.0505%	20
	4,514,436		

DULUTH SOUTH SHORE & ATLANTIC RAILWAY.

Freight Car Miles.

	System		Michigan		
Loaded cars	14,076,931	DSS&ARy	3,885,755		
		Foreign	8,026,241		
Empty cars	4,952,908	DSS&ARy	1,965,519		
		Foreign	2,280,755		
Mixed trains, loaded	108,861	DSS&ARy	23,024		
		Foreign	85,837		
Mixed trains, empty	106,698	DSS&ARy	46,552		
		Foreign	60,146		
Special trn, loaded	15,655	Foreign	14,485		
	19,261,053		16,388,314		
Caboose cars	989,575		809,934		
" " special	1,306		1,176		
	20,251,934		17,199,424	84.9273%	12
Less caboose	990,881		811,110		
	19,261,053		16,388,314	85.0852%	13

Factor 9

1917

DULUTH SOUTH SHORE & ATLANTIC RAILWAY.

All Accounts—Block IV—Transportation.

Excepting 371, 390, 391, 407, 410, 411, 412, 413 and 414.

				Michigan Percentage	
A.	Accounts 372 to 389, 392 to 405 and 415 to 420.	Michigan	$1,271,380.96	84.2399%	1
		System	1,509,238.03		
				Passenger Percentage	
B.	Accounts 372 to 389 392 to 405 and 415 to 420.	Passenger	333,041.54	26.5062%	4
		Michigan	1,256,467.12		
				Mineral R'nge Percentage	
C.		Min. Rng.	14,333.33	4.3038%	7
		Passenger	333,041.54		

All accounts excepting 371, 390, 391, 407, 410, 411, 412, 413, 416, 420.

Passenger & Baggage	$171,918.36	53.9329%	
Sleepers	76,222.34	23.9119%	
Diners	31,047.73	9.7401%	
Mail & Express	39,574.93	12.5151%	12

DULUTH SOUTH SHORE & ATLANTIC RAILWAY

Car Accountant's Office

System		$4,885.20
Estimated 15% Passg'r		732.78
" 85% Freight		4,152.42

To Michigan

$ 732.78 on Factor 7-B	$ 622.35
4,152.42 on Factor 8-12	3,526.54

1917

Duluth South Shore & Atlantic Railway.

Train Miles.

	System			Michigan			
	Total	Freight	Passenger	Total	Freight	Passenger	
Road	1,906,205	1,001,497	906,708	1,569,453	820,729	748,724	1
Mixed	17,010	14,630	2,380	17,010	14,630	2,380	2
Spl. Pass	376		376	200		200	3
Spl. Mixed	1,397	1,018	379	1,333	971	362	4
	1,926,988	1,017,145	909,843	1,587,996	836,330	751,666	5
Road Swi.	169,258	167,044	2,214	147,704	145,490	2,214	6
	2,096,246	1,184,189	912,057	1,735,700	981,820	753,880	7
Min. R. RR.	48,129		48,129	48,129		48,129	8
M. R. R. R.	*4,319		*4,319	*4,319		*4,319	9
	2,140,056	1,184,189	955,867	1,779,510	981,820	797,690	10
C. M. & St. P. Ry own trns.	20,724		20,724	20,724		20,724	11
C. & N. W. Ry. own trns.	10,980		10,980	10,980		10,980	12
	2,171,760	1,184,189	987,571	1,811,214	981,820	829,394	13
Lt. Locos	76,339	55,463	20,876	69,433	51,219	18,214	14

11-A Frt. train miles, all into Mich.
981,820 82.9108%

1,184,189

11-B. Pass. train miles, all into Mich.
797,690 83.4520%

955,867

11-C. Train miles Mich. including Road switch and light loco's—excluding Mineral Range.
P 805,798 43.7599%

F 1,033,039

1,838,837

11-D. Train miles, Switch and road made on main track, plus light locos less MRRR (Factor 15 included)
P 789,202 42.7527%
F 1,056,765

11-E Miles, less MRRR plus switch from Factor 15.
F 1,335,200
P 811,403 37.7983%

2,146,633

11 F Miles less Rd. Swi and MRRR, plus Lt locos and Yard Switch
F 1,189,710
P 809,249 40.4835%

1,998,959

11-G Miles, frt., less mixed, to Mich.
967,190 82.6970%

1,169,559

11-H Miles Pass. less mixed, to Mich.
MR 43,810 4.5947%
783,304 82.1410%

953,487

11-J Line 7
753,880 43.4338%

1,735,700

Factor 12

1917

Duluth South Shore & Atlantic Railway

Accounts Up to General Expenses

Blocks				
I	System	Michigan		
II				
III	$2,949,072.10	$2,451,440.40	83.1258%	7
IV				
VI				

Blocks				
I	Michigan	Passenger		
II				
III	$2,451,440.40	$661,132.02	26.9691%	15
IV				
VI				

Services Percentage.	
Passenger and Baggage	51.7422%
Sleepers	20.6033%
Diners	15.8649%
Mail and Express	11.7896%

DULUTH SOUTH SHORE & ATLANTIC RAILWAY

Gross Weights—Trains.

	—Freight—		—Passenger—	
	All Tracks	Common Tracks	All Tracks	Common Tracks
Cars	287,426,296	287,426,296	166,318,659	166,318,659
Locomotives	106,395,549	106,395,549	83,237,457	83,237,457
Loading	291,582,826	291,582,826	7,833,700	7,833,700
Total train weight	685,404,671	685,404,671	257,389,816	257,389,816
Train switch	27,699,550	15,772,124	350,358	350,358
Yard switch	73,550,207	34,475,755	1,031,650	485,939
	786,654,428	735,652,550	258,771,824	258,227,113
Ton miles Co.'s frt. (est.)	11,384,582	11,384,582		
	798,039,010	747,037,132		
			24.4861%	25.6875%
Above includes Company freight and weights of cars carrying it.	18,098,686	18,098,686		

Factor 14

1917

DULUTH SOUTH SHORE & ATLANTIC RAILWAY

Mileage of Track Chargeable to Services and Percentage of Same on Basis of Two Miles of Side Track Is Equal to One Mile of Main Track.

	Miles	Adjusted	
Common to freight and Passenger			
Main track	408.85	408.85	
Second track	6.55	6.55	
Sidings	40.80	20.40	
	456.20	435.80	82.5238%
Exclusive Freight			
Main Track	12.07	12.07	
Ore Spurs	20.87	10.43	
Industrial Spurs	20.76	10.38	
Sidings	116.71	58.36	
	170.41	91.24	17.2773%
Exclusive Passenger			
Sidings	2.10	1.05	.1989%
	628.71	528.09	100.0000%

DULUTH SOUTH SHORE & ATLANTIC RAILWAY.

Statement of Switching Miles, Michigan.
Statement of Work Miles, Michigan.

	—Freight—		—Passenger—		
	Total	On Common Tracks	Total	On Common Tracks	
Yards					
Freight	302,161	137,597			2
Passenger			7.665	3,618	3
Train					
Freight	145,490	82,842			9
Passenger			2,214	2,214	10

Yard Switch.

	System	Michigan		
Total	319,399	309,826	97.0028%	
Passenger	7,665	7,665	2.474% Pass in Mich.	

Work Train Miles.

System	Michigan		
74,712	53,928	72.1812%	17

Switch to Services

Passenger & Baggage	44.50%	
Sleepers	31.08%	
Diners	19.36%	
Mail & Express	5.06%	20

1917

DULUTH SOUTH SHORE & ATLANTIC RAILWAY.

Combining Factors 13 and 14 for division of Track Accounts in Michigan.

				Passenger Percentage	
A.	Freight, Factor 14	17.2773%			
	Passenger	.1989%		.1989%	
	Common	82.5238%	Factor 13-12	21.1983%	
			Total Passenger	21.3972%	4
B.	Freight, Factor 14	17.2773%			
	Passenger	.1989%		.1989%	
	Common	82.5238%	Factor 11-D	35.2811%	
			Total Passenger	35.4800%	9

Duluth South Shore & Atlantic Railway Company.

Details of weights, ton miles, of Passenger cars and contents to various Passenger Services.

		Passenger & Baggage	Mail & Express	Sleepers	Diners	
A.						
Passenger cars			540,283			1
Other Pass cars			21,161,983			2
Sleeper, Parlor & Ovs—Foreign				14,904,003		3
Diners—Forgn					3,313,820	4
Sleepers DSS&A				29,635,996		5
Obvs Diners DSS&ARy.					11,302,591	6
Diners DSS&A					7,065,803	7
Train Loading			2,818,249			8
Total	174,152,359		24,520,515	44,539,999	21,682,214	9
Percentages		47.8947%	14.0799%	25.5758%	12.4501%	10
Pass train Switch	350,358		58,393			11
	174,502,717		24,518,908	44,539,999	21,682,214	12
Percentages		47.9652%	14.0857%	25.5240%	12.4251%	
Pass Yard Switch	486,939		19,477	190,293	118,524	13
	174,989,656		24,598,385	44,720,292	21,800,738	14
Percentages		47.9286%	14.0571%	25.5560%	12.4582%	15
B. Tonnages handled by DSS&ARy engines.						
Pass cars	63,525,672		540,283			
Other Pass cars	33,469,015		21,138,427			
Slpr, Parlor & Obvs—For	14,584,263			14,584,263		
Diners Foreign	3,313,820				3,313,820	
Sleepers DSS&ARy	29,635,996			29,635,996		
Obvs Diners DSS&ARy	11,302,591				11,302,591	
Diners	7,065,803				7,065,803	
Train Loading	7,516,660		2,501,609			
Pass. Swi	350,358		58,393			
	170,754,178		24,238,712	44,220,259	21,682,214	
Percentages		47.2131%	14.1942%	25.8955%	12.6972%	28

1917 Factor 18

Duluth, South Shore & Atlantic Railway Company.

Detail of Car Miles on Passenger Trains to various Passenger Services—Michigan.

	Total	Pass. & Bag	M & E	Sleepers	Diners	
Passenger Cars	1,773,983	1,755,383	21,600			
Pass cars, Spl.	4,111	4,111				
Other Pass trn cars	859,653	323,013	536,640			
Other Pass trn cars. Spcl.	302	302				
DSS&ARy Obvs Diners	177,602				177,602	
DSS&A Diners	115,361				115,361	
Foreign Diners	48,982				48,982	
Parlor & Obvs	206,860			206,860		
For, Sleepers, For, Slprs, Parlr & Obvs, Specl	2,474			2,474		
DSS&A Sleepers	516,110			516,110		
	2,708,438	2,082,809	558,240	725,444	341,945	
Percentages		56.1641 %	15.0532 %	19.5620 %	9.2207 %	12
Marquette Run C&NWRy and CM&StPRy	101,895	96,336	1,179	4,380		
	3,810,333	2,179,145	559,419	729,824	341,945	
Percentages		57.1904 %	14.6816 %	19.1538 %	8.9742 %	15
DSS&A on Mineral R. RR	63,873	63,873				
Other DSS&A cars MRRR	50,094	18,831	31,263			
	3,924,300	2,261,849	590,682	729,824	341,945	
Percentages		57.6370 %	15.0519 %	18.5976 %	8.7135 %	19

Switching at St. Ignace. (Parkers Figures)

Passenger & Baggage	1,182	53.9726%	
Mail & Express	283	12.9224%	
Sleepers	489	22.3288%	
Diners	236	10.7762%	
Lines 1 to 4	558,240	21.1371% Mail & Express.	
	2,641,049		

1917

DULUTH SOUTH SHORE & ATLANTIC RAILWAY

Factors for Assignment of Passenger and Baggage Expenses INTER and INTRA

Factor 1. Time consumed in sale tickets.
No analysis made for 1917, therefore pro rata 1916, 87.55%
on ratio of INTRA passengers in 1917, 99.45% 87.07%

Factor 2. Inter and Intra Passenger miles.

Inter	Intra	
9,806,277	23,630,061	70.67%

Factor 3. Overhead for Maintenance of Way and Structures.

Inter	Intra	
$17,066.91	$42,274.51	71.24%

Factor 4. By investigation conducted in part by Mr. Heiss and called the Heiss ratios the Intra % of the following accounts was determined. Set up by the Railroad Company and accepted.

A. Outside Agencies 7.97%
B. Advertising 30.74%

Factor 5. Overhead to Traffic.

Inter	Intra	
$15,026.32	$5,209.95	25.75%

Factor 6. Overhead for Transportation.

Inter	Intra	
$47,234.75	$125,368.63	72.6340%

Factor 7. Overhead for General Expenses.

Inter	Intra	
$107,890.84	$224,301.42	67.5216%

1917.

Duluth, South Shore & Atlantic Railway

DISTRIBUTION OF

OPERATING EXPENSES

BY PRIMARY ACCOUNTS.

A. System.
Michigan Passenger.
Michigan Passenger Services.

Followed by Tabulations of these Accounts.

B. Assignment of Passenger and Baggage Expenses to INTER and INTRA.

C. Distribution of Income Accounts up to return on Investment.

The basic figures as used in the following computations and divisions of Expenses are used as taken from the books and records of the company, without adjustment, for the purpose of reducing them to those necessary for a normal year of operation and are subject to adjustment to be made to eliminate expenditures to make good deferred maintenance, and those for additions and betterments.

It is the claim of defendants that the expenses in the maintenance of way group of this year were excessive in at least the amount of

1914	$202,000
1915	20,000
1916	17,000
1917	90,000

The presentation of the following computations of income is not intended to waive the claim that the passenger earnings of the M. T. Co. are to be added to the net corporate income of the passenger business, particularly if sleeping car and dining car operations are to be included.

Details of Distribution of Primary Accounts.

Account		System	Michigan	Passenger
201	SUPERINTENDENT M. of W. & S.	$27,128.64		
	Factor 1-5		$22,111.09	
	Factor 1-10			$5,011.63
	To Services Factor 1-20.			

Account		System	Michigan	Passenger
202	ROADWAY MAINTENANCE.	$67,154.21		
	Located		$51,501.38	
	Factor 16-9			18,272.69
	To Services Factor 17-15.			

Account		System	Michigan	Passenger
208	BRIDGES, TRESTLES & CULVERTS.	$56,220.96		
	Located		$17,620.88	
	Mich. Located to Freight, $827.73, $16,793.15 to 13-12			$4,313.74
	To Services Factor 17-15			

Account		System	Michigan	Passenger
212	TIES.	$78,794.08		
	Located		$60,334.49	
	Passenger Factor 16-4			$12,909.89
	To Services on Factor 17-15.			

Account		System	Michigan	Passenger
214	RAILS.	$35,448.39		
	Located		$34,075.48	
	Factor 16-4			$7,291.20
	To Services Factor 17-15.			

Account		System	Michigan	Passenger
216	OTHER TRACK MATERIAL.	$36,880.12		
	Located		$30,615.83	
	Factor 16-14			$6,550.93
	To Services Factor 17-15.			

Details of Distribution of Primary Accounts (Continued).

Account		System	Michigan	Passenger
218	BALLAST.			
		$15,603.58		
	Located		$14,838.08	
	Factor 16-4			$3,174.93
	To Services Factor 17-15.			
220	TRACK LAYING & SURFACING.			
		System	Michigan	Passenger
		$264,790.85		
	Located		$218,853.10	
	Factor 16-4			$46,828.44
	To Services Factor 17-15.			
221	RIGHT OF WAY FENCES.			
		System	Michigan	Passenger
		$7,515.46		
	Located		$5,799.19	
	Factor 11-C			$2,537.72
	Should have been 11-E; chgr. should be $2,192.00.			
	E mistaken for C in copying.			
	To Services Factor 17-15.			
223	SNOW & SAND FENCES & SNOW SHEDS.			
		System	Michigan	Passenger
		$796.28		
	Located		$757.13	
	Factor 11-E			$268.18
	To Services Factor 17-15.			
225	CROSSINGS & SIGNS.			
		System	Michigan	Passenger
		$2,911.06		
	Located		$2,583.33	
	Located to freight		782.74	
	Common		1,710.59	
	Factor 11-E			$646.57
	To Services Factor 17-15.			

Details of Distribution of Primary Accounts (Continued).

Account
227 A. STATION BUILDINGS.

	System	Michigan	Passenger
	$8,769.79		
Located		$7,912.11	
Marquette Passgr. Sta. % to Gen. Ofs. Michigan	Freight	178.98 Passenger	) Common
Located	$1,786.86	$1,763.64	$4,362.21
Com. on acct. 373		542.71	
		$2,306.35	$2,306.35
To Services 10% Mail and Express 6.557% Sleepers			

Account
227 B. GENERAL OFFICE PORTION OF MARQUETTE DEPOT. 178.98
To Mich. on Car Accountants Office.
Pass. 15% 26.85 Factor 7-C—Passenger $ 22.80
Frt. 85% 152.13 Factor 8-12—Freight 129.20
To Services on 12-20.

Account
229 ROADWAY BUILDINGS.

	System	Michigan	Passenger
	$6,362.98		
Located		$6,196.66	
Factor 1-10			$1,404.52
To Services Factor 1-20.			

Account
231 WATER STATIONS.

	System	Michigan	Passenger
	$6,834.21		
Factor 5-B		$5,689.10	
Factor 5-D			$1,751.69
To Services Factor 17-28.			

Account
232 FUEL STATIONS.

	System	Michigan	Passenger
	$8,542.36		
Factor 5-A		$7,211.90	
Factor 5-C			$2,138.08
To Services Factor 17-28.			

Details of Distribution of Primary Accounts (Continued).

Account
235 SHOPS & ENGINE HOUSES.

	System	Michigan	Passenger
	$7,619.59		
A. Located Engine Houses		$6,117.48	
B. Shops 1330.36			
B. Mich. Pro. of Shops Factor 2-1		1,124.14	
A. Engine Houses Factor 4-6			$1,729.58
B. Shops Factor 2-5			322.06
			$2,051.64

To Services
$322.06 on 2-16
$1,729.58 on 17-28

Account
241 WHARVES & DOCKS.

	All Michigan	Passenger
St. Ignace Dock Mdse. Frt.	$ 638.21	
St. Ignace Dock Slip	1,415.08	
Passenger Pro. on Cars		$288.25
St. Ignace Foot Bridge		824.33

To Services Factor 18-22.

Account
243 COAL & ORE WHARVES,
All Michigan and all freight $17,285.44

Account
244 COAL & ORE WHARVES Dep'n.
All Michigan and all freight $19,145.88

Account
247 TELEGRAPH & TELEPHONE LINES.

	System	Michigan	Passenger
	$6,052.85		
Located		$4,707.24	
Factor 9-B			$1,247.71

Proportioned on 1914 % to Station & Transportation.
To Services
$596.41 Factor 18-12
$651.30 Factor 9-10

Account
249 SIGNALS & INTERLOCKERS.

	System	Michigan	Passenger
	$1,382.19		
Located		$686.63	
On Spl. factor of occupancy of tracks by time and No. of Trains, 5.24%			$35.98

Details of Distribution of Primary Accounts (Continued).

Account		System	Michigan	Passenger
265	MISCELLANEOUS STRUCTURES.			
	Located	$58.10	$58.10	
	To Passgr. 9-4			$15.40
	To Services Factor 1-20.			
269	ROADWAY MACHINES.			
		System	Michigan	Passenger
		$2,215.95		
	Located		$1,993.19	
	Factor 1-10			$451.77
	To Services Factor 1-20.			
271	SMALL TOOLS & SUPPLIES.			
		System	Michigan	Passenger
		$9,223.40		
	Located		$7,766.91	
	Factor 1-10			$1,760.42
	To Services Factor 1-20			
272	REMOVING SNOW, SAND & ICE.			
		System	Michigan	Passenger
		$49,937.17		
	Located		$45,184.34	
	Passgr. direct 1%			$451.84
	Common direct 70% by agreement 31629.04 on factor 11-E			11,955.34
				$12,407.08
	To Services Factor 17-12.			
274	INJURIES TO PERSONS.			
		System	Michigan	Passenger
		$2,471.75		
	Located		$2,202.05	
	Located to freight 173.85			
	Common 2028.20 on Factor 1-10			$457.44

Details of Distribution of Primary Accounts (Continued).

Account 275 INSURANCE.

	System	Michigan	Passenger
Located by Ry. Co.	$4,234.72	$3,711.16	

Michigan	Common	Passenger	Freight
Marquette Pass. Sta.		$60.00	
Other Pass. Sta.	$518.34	67.50	$283.34
Eng. Houses	361.80		43.80
Water Tanks	302.60		7.20
Coal Stations	205.86		6.72
29449 Shops Marq.	248.76	Factor 2-1	
Shops other	11.32		
Work Eqt.	.64		
Bridges, etc	628.44		
Freight			937.40
Dov. Eng. Boiler	27.34		

To Passenger			
Eng. Houses	$389.14	Factor 4-6	$110.02
Bridges	628.44	" 13-12	161.43
Shops & Wk.	260.72	" 2-5	74.69
Water & Coal	508.46	" 5-D	156.56
Stations	518.34	Acct. 373	65.19

To Services Factor 1-20.

Account 276 STATIONERY & PRINTING.

	System	Michigan	Passenger
	$971.61		
Factor 1-5		$791.91	
Factor 1-10			$179.49

To Services Factor 1-20.

Account 277 OTHER EXPENSES M. of W. & S.

	System	Michigan	Common
	$129.70		
Located		$89.89	$39.90
Com. on Factor 1-5		32.52	
Total Michigan		$122.32	
			Passenger
Factor 1-10			$27.72

To Services Factor 1-20.

Details of Distribution of Primary Accounts (Continued).

Account
278 MAINTENANCE JT., YDS., TKS., Etc., DR.

	System	Michigan	Passenger
	$8,902.02		
Located		$7,258.51	

Michigan	Freight	Passenger	Common
Located	$6,329.96	$816.62	$111.93
Com. on Acct. 373		14.80	

5.58 is bridge direct.

To Services
811.04 Factor 18-12
5.58 direct P. & B.
1408 acct. 373.

Account
279 *MAINTENANCE JT., TRKS., YDS., CR.

	System	Michigan	Passenger
Located	$16,373.28	$16,214.38	

Michigan	Freight	Passenger	Common	
Located	$7,100.06	$4,022.07	$5,092.25	A. $4,022.07
Common				
Tracks	2,789.79	Factor 16-4		A. 596.94
Rd. House	430.31	" 4-6		B. 121.66
Common	803.95	" 1-10		D. 182.22
Water Tanks	1,008.20	" 5-D		C. 328.90

To Services
A. Factor 17-15
B. " 17-28
C. " 17-28
D. " 1-20

*Credit Account

Account
301 SUPERINTENDENCE M. OF EQT.

	System	Michigan	Passenger
	$13,349.02		
Factor 2-1		$11,279.74	
" 2-5			$3,231.54

To Services Factor 2-16.

Details of Distribution of Primary Accounts (Continued).

Account
302 SHOP MACHINERY.

	System	Michigan	Passenger
	$19,855.62		
Factor 2-1		$8,327.86	
" 2-5			$2,,385.86

Account
308 STEAM LOCO. REPAIRS,

	System	Delf's Figures	Michigan
Freight	$63,794.38	Factor 6-F	$ 53,405.27
Passenger	48,363.73	" 6-H & Spl.	40,468.74
Mixed	463.38	" 6-3-5	461.78
Yd. Switch	14,745.92	" 15-14	14,303.96
			$108,639.75

Passenger Direct $40,468.74
Mixed 15.03% 69.41
Switch Factor 15-14 353,88
M. Range $2,143.72
To Services $38,394.43 on factor 17-28
353.88 on factor 15-20

Account
309 STEAM LOCOMOTIVE. DEPRECIATION.
System located by Ry. Co.

Freight	$11,532.49	Frt. loco. miles incl. mixed Fac 6	$9,665.67	
Passgr.	6,947.58	Pass. loco. miles incl. mixed Fac 6	5,814.35	
Yard	3,294.83	Factor 15-14		3,196.08
Work	638.27	" 15-17		460.71
To Passenger direct incl. M. R.	$308.00		$5,814.35	
Yard Pass. %			79.05	

To Services.
$79.05 on 15-20
5,814.35 on 17-28

Account
310 STEAM LOCOMOTIVE RETIREMENTS.
Delf's system figures.

Freight	$128.74	Est. $130.00	Frt. same as 309 frt.		$108.97
Passgr.	5.71	6.30	Pass. " " " pass.		5.19

Mineral Range 20c.
$4.99 to services to 17-28.

Details of Distribution of Primary Accounts (Continued).

Accounts				System	Factor	Michigan
314	FREIGHT TRAIN CAR REPAIRS.			$160,384.15	8-12	$136,209.93
315	"	"	" Depn.	61,517.15	8-12	52,244.85
316	"	"	" Retirement	17,232.69	8-12	14,635.26

Account
317 PASSENGER TRAIN CAR REPAIRS.

	System			Michigan	
Sleepers (1914) figs.	$ 5,454.97	Factor	7-10	$ 4,118.89	
Diners (1914) figs.	3,850.21	"	7-4	3,222.42	
All other pass. cars	41,307.52	"	17-A	1,643.42	MR
		"	17-A	32,877.85	

To Services $32,877.85 on 18-23.

Account
318 PASSENGER TRAIN CAR—DEPRECIATION.

Value Sleepers	$2,684.00	same as 317	$2,026.61
" Diners	2,421.00	same as 317	2,025.25
" Other Cars	7,262	same as M. Range	288.92
		" other	5,780.04

$5,780.04 on Factor 18-23 to services.

Account
326 WORK EQUIPMENT REPAIRS.

	System	Michigan	Passenger
	$14,207.56		
Factor 1-2		$11,205.83	
" 1-8			$2,596.17

Account
327 WORK EQUIPMENT DEPN.

	System	Michigan	Passenger
	$3,669.80		
Factor 1-2		$2,894.46	
" 1-8			$670.59

Account
328 WORK EQUIPMENT RETIREMENTS.

	System	Michigan	Passenger
	$277.92		
Factor 1-2		$218.20	
" 1-8			$50.78

To Services Factor 1-7

Details of Distribution of Primary Accounts (Continued).

Account
332 INJURIES TO PERSONS.

		System $2,668.58	Michigan	Passenger
Located				
Freight	$ 854.81	Factor 8-12	$ 725.97	
Passgr.	17.80	" 7-A	14.88	
Com.	1,793.97	" 2-1	1,575.88	
To Passenger				
Direct		148.88		
Com. Factor 2-5		434.29		
Total Passgr.				
To Services Factor 2-16				$449.17

Account
333 INSURANCE.

	System $2,500.05		Mich. Ma. Co.
Located to Mich. by Delf			
Eng. Houses, Frt.	4.50		$ 4.50
Marq. Shops	421.14	Factor 2-1	421.14
Miscell. Shops	41.60		41.60
Passgr. Cars	283.69		283.69
Eng. House Com.	31.80		31.80
Freight Cars	1,156.07		1,156.07
Work	34.93		34.93
Locos.	172.29		172.29
To Passenger located	283.69		
Com. $701.67, Factor 2-5	201.02		
To Services			
$201.02 on Factor 2-16			
$283.69 on Acct. 318			

ccount
334 STATIONERY & PRINTING.

	System $1,710.20	Michigan	Passenger
Factor 2-2		$1,445.04	
" 2-5			
To Services Factor 2-16			$413.99

Details of Distribution of Primary Accounts (Continued).

Account 336 MAINTENANCE JT. EQT. AT TERMINALS. DR.

	System	Michigan	Passenger
Located	$1,997.34		
"		.54	
"			.22
To Services Factor 2-16			

Account 337 MAINTENANCE JT. EQT. AT TERMINALS.—CR.

	System	Michigan	Passenger
Located	$1.50	$1.50	$0.43
To Services, Factor 2-16			

Accounts		System	Michigan	Passenger
351	Superintendence Traffic	$32,164.44	$26,500.83	$11,698.49
352	Outside Agencies	32,714.80	26,957.37	12,553.37
353	Advertising	3,757.31	3,103.76	3,070.87
354	Traffic Association	362.00	297.64	
355	Fast Freight Lines	7.01	5.76	
357	Insurance	109.45	50.88	50.01
358	Stationery & Printing	8,902.51	7,331.04	2,415.80
	Above located on company's figures.			
357	Indust'l & Im'gn Bureaus	9,127.77	7,988.82	2,146.22
	357 on Revenue basis. All to Passenger & Baggage.			

Account 371 SUPERINTENDENCE TRANSP.

	System	Michigan	Passenger
	$23,735.73		
Car Accts.	4,885.20		
	$18,850.53		
$18,850.53 Factor 9-1		$16,722.07	
$4,885.20, 15% Pass., $732.78, Factor 7B		622.35	622.35
85 Frt. $4,152.42, Factor 8-12		3,526.54	
Com. $16,722.07 on 9-4			4,432.39
			$5,054.74
To Services M. Range $234.76, Factor 9-12			

Details of Distribution of Primary Accounts (Continued).

Account					
372	DISPATCHING TRAINS.		System	Michigan	Passenger
			$14,583.76		
	On train miles plus switching & light engines & less Min Range Road Switch, 85.2487%			$12,432.97	
	1/3 Dispatching Trains 11-F, 40.4835%				
	1/3 Dispatching Trains To affect reciprocal Sta. Services	40.4835			
	Less 373%	12.5769%	27.9066		
	1/3 Dispatching distributing Cars all freight		68.3911		
		1/3 =	22.7967%		$2,834.19
	To Services, Factor 17-15				

Account					
373	STATION EMPLOYEES.		System	Michigan	Passenger
	Located		$194,131.22	$174,816.70	
	Located to Michigan by M. A. Co. Freight		Freight	Passenger	Common
			$79,330.95	111,412.79	$84,072.96
	Freight and Passenger located % is 12.5769%				
	Common on 12.5769%			10,573.77	
				21,986.56	

10% to Mail & Express.

6.557% to Sleepers on timed service, and on tickets in 1916. Not taken for 1917—Data not ready.

Account			
374	WEIGHING & INSPECTION BUREAUS.	System	Michigan
		$1,428.16	
	On Factor 11-A, all freight		$1,174.23

Account		
375	COAL & ORE WHARVES.	
	All Michigan and all Freight	$26,626.23

Details of Distribution of Primary Accounts (Continued).

Account
376 STATION SUPPLIES & EXPENSES.

			System	Michigan	Passenger
			$13,116.91		
Located				$12,021.18	
Michigan	Freight	Common			
	$3,569.07	$7,010.66			$1,441.45
Common on account 373					881.72
Services all Passenger & Baggage					$2,323.17

Accounts
377 to 389 YARD ACCOUNTS.

On actual analysis each yard, each account and time spent in Passenger service in Marquette and St. Ignace the only towns where there is passenger switching—agreed $4,090.18

To services on Factor 18-22.

Following accounts used later on specially:

Marquette 3.52% Passenger.	St. Ignace 3.79% Passenger.
Fuel, St. Ignace	$ 9,661.51
Fuel, Marquette	19,929.71
Water, Marquette	479.29
Water, St. Ignace	235.00
Enginehouse Service, St. Ignace	1,984.09
Enginehouse Service, Marquette	8,549.39

Account
390 OPERATING JT. YARDS TERMINALS. DR.

		System	Michigan	Passenger
		$31,426.19		
Located			$19,421.05	
Michigan located Frt.	12,857.06			
Michigan located Pass.				$6,527.32
Common located, Common 36.67, Factor 9-4				9.72
To Service, Factor 9-12				

Details of Distribution of Primary Accounts (Continued).

Account
391 OPERATING JT. YARDS TERMINALS. CR.

		System	Michigan	Passenger
Located		$17,280.14	$17,280.14	
Michigan	Freight	Passgr.	Common	
located	$13,209.50	$222.25	$3,042.18	$222.25
Com. Eng. House on engines handled at Soo:				
Passgr. 894	51.26%			1,559.41
Mixed 161	9.23%	280.79	13.99%	39.28
Frt. 689	39.51%			
			Total Passenger	$1,820.94

To Services on 9-12

Account
392 TRAIN ENGINEMEN.

	System		Michigan	Passenger
Freight	$132,228.46	Factor 6-C	$110,873.56	
Passgr.	73,271.08	" 6-D	61,338.97	$61,338.97

Mineral Range, $3,239.02.
To Services, Factor 17-28.

Account
394 FUEL FOR TRAIN LOCOS.

	System		Michigan		Passenger
Freight	$294,652.27	Factor 6-1&6	$246,479.57		
Passgr.	143,139.18	" 6-H	119,785.31		$119,785.31
Mixed	2,324.65	all	2,324.65	13.99%	325.22
Special	470.54	6-G	415.20	Fac. 6-L	141.43

Passenger includes $6,348.51 Mineral Range.
To Services on 17-28.

Account
397 WATER FOR TRAIN LOCOS.

	System	Michigan	Passenger
On % of Acct. 394	$17,175.85	$14,375.31	$4,688.71

Mineral Range $247.50.
To Services, Factor 17-28.

Details of Distribution of Primary Accounts (Continued).

Account 398 LUBRICANTS FOR ROAD LOCOS.

			System	Michigan	Passenger
			$6,898.52		
Located	System				
Freight	$4,146.36				
" Spl	4.57	6-1&6		$3,464.65	
Mixed	41.32	all		41.32	
Passgr.	2,709.84	6-H		2,267.72	
Spl. Mixed	5.57	all		5.57	
Direct					$2,267.72
Mixed (Spl.) 15.03%					7.04
of which Mineral Range $120.19					
To Services, Factor 17-28.					

Account 399 OTHER SUPPLIES FOR TRAIN LOCOS.

Located	System		Michigan		Passenger
Freight	$2,074.03	Factor 6-1&6	$1,735.37		
Passgr.	1,245.33	O. & H.	1,042.15	all	$1,042.15
Mixed	31.76	all	31.76	13.99%	4.44
Common on 183					
Freight	365.46	Factor 6-1&6	305.71		
Passgr.	219.49	" 6-H	183.68		183.68
			Total Passenger		$1,230.27

Of which $64.97 is Mineral Range.
To Services, Factor 17-28.

Account 400 ENGINE HOUSE EXPENSES TRAIN.

	System	Michigan	Passenger
	$55,954.53		
Located		$48,306.39	
Located by Eng. in & out Rd. House			$18,363.80
To Services 17-28.			

Details of Distribution of Primary Accounts (Continued).

Account
401 TRAINMEN.

		System			Michigan
Freight		$167,752.97			
Mixed 86.01%		3,093.78	$170,846.70	Fac. 11-A	$141,649.51
Passenger		$ 64,125.85			
Mixed 13.99%		503.22	64,629.07	" 11-B	53,934.25
Of which $2,939.08 is M. Range					
Balance $50,995.17 assigned as follows:					
% of Men Taken for Two Months' Test					
Conductors	53.53%			$27,297.72	
Brakemen	28.53%			14,548.92	
Baggagemen	17.94%			9,148.53	
Assigned			Passenger & Bag.		Train Wk.
Conductors 50-50			$13,648.86		$13,648.86
Brakemen					14,548.92
Baggagemen			9,148.53		
			$22,797.39		$28,197.78

$22,797.39 to P. & B. Direct
28,197.78 to Services on 18-12

Account
402 TRAIN SUPPLIES & EXPENSES.

	System			Michigan
A. Frt. Lubricating	$ 5,523.12	Factor	8-12	$ 4,690.64
B. " Other	4,358.82	"	11-B	3,613.66
C. Pass. Lubricating	19,489.20	"	7-A	16,287.40
D. " Other	13,031.98	"	11-10-6	10,870.17

Of which $1,374.16 is M. Range
To Services Factor 18-12

Account
404 SIGNAL & INTERLOCKER EXPENSES.

	System	Michigan	Passenger
	$1,364.04		
Located		$31.06	
On Spl. Test 5.24%			$1.63
To Services Factor 18-14			

Details of Distribution of Primary Accounts (Continued).

Account
405 CROSSING PROTECTION.

	$9,663.77		
Located		$9,183.77	
On Spl. Test 5.24%			$481.23
To Services Factor 18-14			

Account
407 TELEGRAPH & TELEPHONE.

	System	Michigan	Passenger
Located	$108.33	$108.33	
Factor 9-4			$28.71
To Services Factor 9-12			

Account
410 STATIONERY & PRINTING.

	System	Michigan	Passenger
	$16,085.76		
Factor 9-1		$13,550.63	
To Pass. & Frt. & Com. on Delfs. % of system			
Freight 46.831%			
Passgr. 23.828%		23.828%	
Com. 29.841%			
Com. 29.841% Factor 9-4		7.6447%	
		30.9727%	$4,200.09
Passgr.			
To Services 9-12			

Account
411 OTHER EXPENSES—TRANSPORTATION.

				System
				$1,776.60
Mich.	Freight		Passenger	Common
	$958.40		$0.77	$28.65
Com. to Supt.	$508.13	Freight		
8/9 of Adv.	111.11			
Ton mile %	$629.24	$82.22		
" Mich. Frt.	509.96			
Pass. Com.	13.89			
Ton mile %	82.61		11.47	
Com.	28.65	Factor 9-4	7.59	
		Total Passenger	$19.83	
To Services Factor 9-12				

Details of Distribution of Primary Accounts (Continued).

Account
412 OPERATING JT. TRACKS & O. F. DR.

			System	Michigan
Located			$4,227.77	$1,040.59
Michigan	Freight		Passenger	Common
	$848.51		$54.92	
Sidnaw Sta. Supt.				$134.09
Ish. Crossing				3.07
" " to pass.	5.24		.16	
Sidnaw on acct. 376			25.91	
		Total Passenger	$80.99	

To Services P. & B. $54.92 Direct & Inter.
Sidnaw $26.07 on 373

Account
413 OPERATIONS, JT. TRACKS & FAC.

	System	Michigan	Passenger
	$5,454.05		
Located		$3,883.77	
Michigan Freight Passenger Common			
Located $2,286.74 $812.78			$812.78
Sta. Service	$ 90.00	Acct. 373	11.32
" Sup. & Express	447.67	" 376	86.51
Water Tanks	248.66	" 5-D	76.56
	Total Passenger		$987.17

$ 76.56 on 17-28
910.61 " Acct. 373 to Services

Account
414 INSURANCE.

		System	Michigan	Passenger
		$1,251.46		
Michigan	Freight	Passenger	Common	
	$908.40	$66.00	$120.18	
Common on 9-4		31.86		$97.86

To Services on Acct. 373

Details of Distribution of Primary Accounts (Continued).

Account 415 CLEARING WRECKS

	System	Michigan	Passenger
	$5,785.49		
Located to Michigan		$3,947.38	
Overhead on basis located		3.95	
		$3,953.33	
Located Frt. $3,514.33	Passenger		$433.15
Overhead on located			.43
		Total Passenger	$433.58
To Services 18-12			

Account 416 DAMAGE TO PROPERTY.

	System	Michigan	Passenger
		$265.24	
Located all Mich.			
Freight	$152.70		
Passenger	4.35		$ 4.35
Common	108.19	Factor 16-9	38.38
			$42.73
To Services 9-12			

Account 417 DAMAGE TO STOCK ON RIGHT OF WAY.

	System	Michigan	Passenger
Located	$479.40	$389.20	$285.00
To Services on 18-4			

Account 418 LOSS & DAMAGES—FREIGHT.

	System	Michigan
	$9,332.73	
On train miles (company)		$7,673.37

Account 419 LOSS & DAMAGE—BAGGAGE.

	System	Michigan
	$219.56	
Located		$206.53

Details of Distribution of Primary Accounts (Continued).

Account
420 INJURIES TO PERSONS.

		System	Michigan	Passenger
		$32,765.67		
Located Michigan	Freight		$14,913.84	
Located	$13,478.06	Passenger $1,152.23	Common $283.55	
Common Factor 9-4				
Direct				$ 75.16
				1,152.23
				$1,227.39

Account
441 DINING BUFFET SERVICE.

	System	Michigan
	$50,588.12	
On earnings (company)		$41,319.15

Account
451 SALARIES: GENERAL OFFICERS.

	System	Michigan	Passenger
	$30,367.11		
Factor 12-7		$25,242.90	
" 12-15			
To Services Factor 12-17			$6,807.78

Account
452 CLERKS & ATTENDANTS.

		System	Michigan	Passenger
		$35,612.46		
Factor 9-7			$29,603.14	
Apply Delfs. Factors of Location for System to Mich.				
Freight	34.11%			
Passenger	19.86%			
Com.	46.03%	$13,626.33 Factor 9-15		$5,583.15
				3,674.90
To Services Factor 12-17				$9,258.05

Account
453 GENERAL OFFICE EXP. & SUP.

	System	Michigan	Passenger
	$4,275.92		
Factor 9-7		$3,554.39	
" 9-15			
To Services Factor 9-17			$958.59

Details of Distribution of Primary Accounts (Continued).

Account
454 LAW EXPENSES.

		System	Michigan	
Cost of Suit (2c Pass.)		$ 4,645.27	$4,645.27	
Other Law Expense		11,109.12		
Located by Ry. as follows:				
Wisc.	$ 183.42			
Michigan	667.61		667.61	
Common	10,258.09	Factor 12-5	8,527.12	
				Passenger
$ 667.61 Located F.	$104.73			
Com.	35.77			
P.	527.11			527.11
$8,527.66 Delfs. % P.	2.05%			174.81
Com	97.38%	$8,303.11 Fac. 12-15		2,249.08
		Total Passenger		$2,951.00

To Services on 12-17 and $210 Direct
To Mail

Account
455 INSURANCE.

	System	Michigan	Passenger
	$116.99		
Factor 12-5		$97.25	
" 12-15			$26.23

To Services Factor 12-17

Account
457 PENSIONS.

	System	Michigan	Passenger
	$1,367.10		
Factor 12-5		$1,136.41	
" 12-15			$306.48

To Services Factor 12-17

Account
458 STATIONERY & PRINTING

		System	Michigan	Passenger
		$6,712.20		
Factor 12-5			$5,579.57	
Delfs. % Freight	9.74%			
Passgr.	4.08%			$ 227.65
Com.	86.18%	$4,808.47 Factor 12-15		1,296.80

To Services Factor 12-17

Details of Distribution of Primary Accounts (Continued).

Account
459 VALUATION EXPENSES.

	System	Michigan	Passenger
	$6,700.60		
Track Miles 83.02%		$5,562.84	
Factor 12-15			$1,500.15
To Services Factor 12-17			

Account
460 OTHER GENERAL EXPENSES.

	System	Michigan	Passenger
	$5,446.06		
Assigned to Mich. Pas.		$ 149.18	$149.18
Freight		1,143.34	
System Com. $3,835.39 on Factor 12-5		3,188.30	
Com. on Factor 12-15			859.53
To Services on Factor 12-17			
After deducting $100 Direct Mail.			

Account
461 GENERAL ADMSTN. JOINT FAC.

	System	Michigan	Passenger
	$555.67		
Located		$77.61	
Located			$17.75
$3.75 Bridge Traffic			
All Passenger & Baggage			

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. Year ending June 30th, 1917.

	a System	b Total Michigan	c Michigan. Passenger.	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express.
I. MAINTENANCE OF WAY AND STRUCTURES.								
201. Superintendence	$ 27,128.64	$ 22,111.09	$ 5,011.63		$ 2,441.80	$ 1,256.77	$ 612.40	$ 700.66
202. Roadway Maintenance	67,154.21							
(a) Care of Roadbed		3,761.87						
(b) General Cleaning		14,489.45						
(c) Watching Roadway		31,164.91						
(d) Bank Protection.		202.15						
(e) Train Service		1,717.30						
(f) Track Changes		165.70						
Total Roadway Maintenance		51,501.38	18,272.69		8,757.84	4,669.77	2,276.47	2,568.61
208. Bridges, Trestles, Culverts	56,220.96	17,620.88	4,313.74		2,067.53	1,102.42	537.42	606.38
212. Ties	78,794.08	60,334.49	12,909.89		6,187.53	3,299.25	1,608.35	1,814.76
214. Rails	35,448.49	30,075.48	7,291.20		3,494.57	1,863.34	908.36	1,024.93
216. Other Track Material	36,880.12	30,615.83	6,550.93		3,139.77	1,674.16	816.13	920.87
218. Ballast	15,693.58	14,838.08	3,174.93		1,521.70	811.39	395.54	446.30
220. Track Laying and Surfacing	264,790.85							
(a) Applying Ballast		19,875.74						
(b) Applying Ties		40,224.23						
(c) Applying Rails		19,838.57						
(d) Applying Other Track Material		3,218.27						
(e) Track Maintenance		128,323.57						
(f) Train Service		6,603.56						
(g) Track Changes		769.16						
Total Track Laying and Surfacing		218,853.10	46,828.44		22,444.22	11,967.47	5,834.03	6,582.72
221. Right of Way Fences	7,515.46	5,799.19	2,537.72		1,216.29	648.54	316.16	356.73

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. Year ending June 30th, 1917 (Continued).

	a System	b Total Michigan	c Michigan. Passenger.	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express.
I. MAINTENANCE OF WAY AND STRUCTURES—(Continued).								
222. Snow, Sand Fences and Snow Sheds	$ 796.23	$ 757.13	$ 286.18	$	$ 137.16	$ 73.14	$ 35.65	$ 40.23
225. Crossings and Signs	2,911.06	2,583.33	646.57		309.89	165.24	80.55	90.89
227. Stations & Office Buildings:								
(a) Station Buildings and Grounds	8,588.71	7,912.71	2,206.35		2,060.59	15.12		220.64
(b) Office Buildings and Grounds	178.96	152.00	22.80		11.26	4.98	3.76	2.80
(c) Track Scales	3,982.72	3,841.46						
229. Roadway Buildings	6,382.98	6,196.66	1,404.52		684.32	252.21	171.63	196.36
231. Water Stations	6,334.21	5,689.10	1,751.69		827.03	453.61	222.42	248.62
233. Fuel Stations	8,542.36	7,211.90	2,128.08		1,009.45	553.67	271.48	302.48
235. Shops and Engine Houses	7,619.59	7,241.62	2,051.64		996.09	506.45	253.13	295.97
241. Wharves and Docks	2,877.62	2,877.62	1,112.58		600.49	248.42	119.89	143.77
243. Coal and Ore Wharves	17,285.44	17,285.44						
244. Coal and Ore Wharves—Depreciation	19,145.88	19,145.88						
247. Teleg. and Teleph. Lines	6,052.85	4,707.24	1,247.71		656.49	288.12	126.24	176.76
249. Signals and Interlockers	1,382.19	686.63	35.98		17.23	9.20	4.48	5.07
265. Miscellaneous Structures	58.10	58.10	15.40		7.50	3.86	1.88	2.16
269. Roadway Machines	2,215.95	1,992.19	451.77		220.12	113.29	55.20	63.16
271. Small Tools and Supplies	9,223.40	7,766.91	1,760.42		857.72	441.46	215.12	246.12
272. Removing Sand, Snow, Ice	49,937.17	45,184.24	12,407.08		5,951.03	3,166.78	1,541.67	1,747.55
274. Injuries to Persons	2,471.75	2,202.05	457.44		222.88	114.71	55.90	63.95
275. Insurance	4,234.72	3,711.16	567.89		276.69	142.51	69.39	79.40
276. Stationery and Printing	97.61	791.91	179.49		87.45	45.01	21.93	25.10
277. Other Expenses	129.70	122.32	27.72		13.51	6.95	3.39	3.87

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. Year ending June 30th, 1917 (Continued).

	a System	b Total Michigan	c Michigan Passenger	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express.
I. MAINTENANCE OF WAY AND STRUCTURES—(Continued).	$	$	$	$	$	$	$	$
278. Maint. Jt. Tks. Yds. & O. F., Dr.	8,902.82	7,258.51	830.70		472.84	159.58	74.78	122.50
279. Maint. Jt. Tks. Yds. & O. F. Cr.	*16,373.28	*16,214.38	*5,261.79		*2,515.33	*1,342.80	*654.93	*738.73
Total Maintenance of Way and Structures *Credit-deduct.	$ 743,959.21	$594,912.45	$131,341.39		$ 64,175.70	$ 32,814.53	$ 15,978.52	$ 18,372.64
II. MAINTENANCE OF EQUIPMENT.								
301. Superintendence	$ 13,349.02	$ 11,279.74	$ 3,231.54	$ 142.39	$ 1,721.16	$ 561.64	$ 321.40	$ 483.95
302. Shop Machinery	9,855.62	8,327.86	2,385.86		1,329.74	433.92	248.30	373.90
308. Steam Locomotives, Repairs:								
(a) Freight	63,794.38	53,405.27						
(b) Mixed	463.38	461.78						
(c) Passenger	48,363.73	40,468.74	40,535.15	2,143.72	18,127.20	9,942.43	4,875.02	5,449.78
(d) Switch-Yard	14,745.92	14,203.96	353.88		157.48	109.99	68.51	17.90
309. Steam Locomotives, Deprec.	22,413.17							
(a) Freight		9,665.67						
(b) Work		460.71						
(c) Passenger		5,814.35	5,814.35	308.00	2,599.72	1,425.90	699.15	781.58
(d) Switch		3,196.08	79.07		35.19	24.57	15.31	4.00
310. Steam Locomotives, Retirements	136.20							
(a) Freight		108.97						
(b) Passenger		5.19	5.19	.20	2.36	1.29	.63	.71
314. Freight Train Cars, Repairs	160,284.15	126,209.93						
315. Freight Train Cars, Deprec.	61,517.15	52,244.85						
316. Freight Tr. Cars, Retire'ts.	17,232.69	14,635.26						
317. Pass. Train Cars, Repairs	50,612.70	41,862.58	41,862.58	1,643.42	25,823.43	4,118.89	3,232.42	6,949.42
318. Pass. Tr. Cars, Depreciation	12,366.74	10,120.82	10,120.82	283.92	4,553.31	2,026.61	2,025.25	1,221.73
326. Work Equip't., Repairs	14,207.56	11,205.83	2,596.17		1,345.72	662.70	322.70	265.05
327. Work Equip't., Depreciation	3,669.80	2,894.46	670.59		321.77	171.18	83.35	94.29

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. Year ending June 30th, 1917 (Continued).

	a System	b Total Michigan	c Michigan. Passenger.	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express.
II. MAINTENANCE OF EQUIPMENT—(Continued).								
328. Work Equip't., Retirements	$ 277.92	$ 219.20	$ 50.78	$	$ 24.37	$ 12.96	$ 6.31	$ 7.14
332. Injuries to Persons	2,666.58	2,256.73	449.17		250.34	81.49	46.75	70.39
333. Insurance	2,500.05	2,145.93	484.71		242.11	72.64	78.53	91.42
334. Stationery and Printing	1,710.20	1,445.04	413.99		230.73	75.29	42.09	64.88
336. Maint. Jt. Equip. at Ter., Dr.	1,997.34	.54	.22		.12	.04	.02	.04
337. Maint. Jt. Equip. at Ter., Cr.	*1.50	*1.50	*.43		*.24	*.08	*.04	*.07
Total Maintenance of Equipment	$502,262.80	$422,737.99	$109,056.64	$ 4,527.65	$ 56,774.51	$ 19,721.66	$ 12,056.70	$ 15,976.13
*Credit-deduct.								
III. TRAFFIC EXPENSES.								
351. Superintendence	$ 32,164.44	$ 26,500.83	$ 11,698.49					
352. Outside Agencies, Frgt	17,518.85	14,404.00						
Outside Agencies, Pass'ngr	15,195.95	12,553.37	12,553.37					
353. Advertising, Freight	40.00	32.89						
Advertising, Passenger	3,717.31	3,070.87	3,070.87					
354. Traffic Associations	362.00	297.64						
355. Fast Freight Lines	7.01	5.76						
356. Indust. and Immig. Bureaus	9,127.77	7,988.82	2,146.22					
357. Insurance	109.45	50.88	50.01					
358. Stationery and Printing	8,902.51	7,231.04	2,415.80					
Total Traffic Expenses	$ 87,145.29	$ 72,226.10	$ 31,934.76		$ 31,934.76			
IV. TRANSPORTATION EXPENSES.								
371. Superintendence	$ 23,735.73	$ 20,870.96	$ 5,054.74	$ 234.76	$ 2,599.55	$ 1,152.25	$ 469.47	$ 598.41
372. Despatching Trains.	14,583.76	12,432.47	2,834.19		1,358.39	724.31	353.09	398.40
373. Station Employees	194,131.22	174,815.70	21,986.56		18,346.46	1,441.44		2,198.66
374. Weighing, Inspection and Demurrage Bureau.	1,428.16	1,174.22						

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. Year ending June 30th, 1917 (Continued).

	a System	b Total Michigan	c Michigan. Passenger.	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express.
IV. TRANSPORTATION EXPENSES—(Continued).								
	$	$	$	$	$	$	$	$
375. Coal and Ore Wharves	26,636.23	26,636.23						
376. Station Supplies and Exp.	13,116.61	12,021.18	2,323.17		2,323.17			
377. Yard Masters & Yard Clerks	5,221.05	5,221.05						
378. Yard Conductors & Brake'n.	58,459.55	54,632.70						
379. Yard Switch & Sig. Tend'rs.	4,915.16	4,877.26						
380. Yard Enginemen	41,721.49	38,737.31						
382. Fuel for Yard Locomotives.	44,126.21	40,214.37						
385. Water for Yard Locomotives	1,217.68	936.28						
386. Lubricants for Yard Locom.	621.49	563.90						
387. Other Sup. for Yard Loco	568.27	546.90						
388. Enginehouse Exp., Yard	18,787.66	17,976.64						
389. Yard Sup. & Exp	1,442.68	1,374.10	4,190.18		2,261.55	935.62	451.54	541.47
390. Operat. Jt. Yds. & Term., Dr.	31,426.19	19,421.05	6,537.04		3,525.62	1,563.13	636.71	811.58
391. Operat. Jt. Yds. & Term., Cr.	*17,280.14	*17,280.14	*1,820.94		*982.09	*435.42	*177.36	*226.07
392. Train Enginemen	205,499.55							
(a) Freight Service		110,873.56						
(b) Passenger Service		61,338.97	61,338.97	3,239.02	27,430.79	15,045.27	7,337.07	8,246.82
394. Fuel for Tr. Locomotives	440,586.64							
(a) Freight		246,479.57						
(b) Passenger		119,785.31	119,785.31	6,384.51				
(c) Mixed		2,324.65	325.22					
(d) Special		415.20	141.43		53,777.35	29,496.87	14,462.55	16,167.68
397. Water for Tr. Locomotives	17,175.85	14,375.31	4,688.71	247.50	2,096.83	1,150.07	563.92	630.39
398. Lubricants for Tr. Locom	6,898.52	5,779.26	2,274.76	120.19	1,017.24	557.94	273.57	305.82
399. Other Sup for Tr. Locom	3,936.07	3,298.67	1,230.27	64.97	1,550.17	301.76	147.96	165.41
400. Enginehouse Exp., Train	55,954.53	48,306.09	18,363.80		8,670.12	4,755.40	2,331.09	2,606.59
401. Trainmen	235,475.77							
(a) Freight Service		141,649.51						
(b) Passenger Service.		53,934.25	53,934.25	2,939.08	38,634.42	5,516.05	2,600.03	4,244.67

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. Year ending June 30th, 1917 (Continued).

	a System	b Total Michigan	c Michigan Passenger.	Assigned to Mineral Range Run	Assigned to Passenger & Baggage	Assigned to Sleepers	Assigned to Diners	Assigned to Mail and Express.
IV. TRANSPORTATION EXPENSES—(Continued).								
402. Train Supplies and Expenses	$ 42,402.82	$	$	$	$	$	$	$
(a) Lubricating Freight		4,090.64						
(b) Other Supplies—Freight		3,613.66						
(c) Lubricating — Pass'r		16,287.40	16,287.40	775.22	3,713.19	3,034.46	1,430.21	2,225.66
(d) Other Supplies—Pass.		16,870.17	16,870.17	598.66	5,768.90	2,009.21	947.11	1,546.19
403. Operating Sleeping Cars	14,455.26	11,016.55	11,016.55			11,016.55		
404. Signal and Interlocker Operations	1,264.04	21.06	1.63		.93	.21	.15	.24
405. Crossing Protection	9,663.77	9,183.77	481.23		275.22	92.17	42.19	70.65
407. Telegraph and Telephone Operations	108.23	108.23	28.71		15.42	6.37	2.80	3.56
410. Stationery and Printing	16,095.76	13,550.62	4,200.09		2,265.23	1,004.32	409.09	521.45
411. Other Expenses	1,777.60	1,509.25	19.53		10.70	4.74	1.93	2.46
412. Operating Jt. Tracks and Facilities Dr.	4,227.77	1,040.59	80.99		76.68	1.70		2.61
413. Operating Jt. Tracks and Facilities Cr.	5,454.06	3,883.77	937.17		796.00	79.53	9.72	101.93
414. Insurance	1,251.46	1,094.53	97.86		81.65	6.42		9.79
415. Clearing Wrecks	5,795.49							
(a) Freight		3,517.85						
(b) Passenger		433.58	433.58		243.46	84.80	39.97	65.25
416. Damage to Property	265.24	265.24	42.72		23.05	10.22	4.16	5.30
417. Damage to Live Stock on Right of Way	479.40	389.20	285.00		152.99	54.59	25.58	51.84
418. Loss & Damage—Freight	9,232.73	7,873.37						
419. Loss & Damage—Baggage.	219.56	206.52	206.52		204.52			
420. Injuries to Persons	32,765.27	14,913.84	1,237.39		661.97	293.48	119.55	153.28
Total Transportation Expenses	$1,565,116.68	$1,220,244.71	$347,490.09	$14,563.07	$178,218.55	$79,744.41	$32,504.26	$41,344.69
VI. MISCELLANEOUS OPERATIONS.								
441. Dining & Buffet Service	50,568.12	41,319.15	41,319.15				41,319.15	

Operating Expenses. A—System, B—Michigan, C—Passenger and Passenger assigned to various Passenger Services. Year ending June 30th, 1917 (Continued).

VII. GENERAL EXPENSES.

	$	$	$	$	$	$	$	$
451. Salaries & Expenses—General Officers	30,367.11	25,242.90	6,807.78					
452. Salaries and Expenses—Clerks and Attendants	25,612.46	29,803.14	9,258.[illegible]					
453. General Office Supplies and Expenses	4,275.92	3,554.29	958.59					
454. (a) Law Expenses	15,745.39	9,194.73	2,951.00					210.00
(b) Law Expenses—cost of suit		4,645.27						
455. Insurance	116.99	97.25	26.23					
457. Pensions	1,267.10	1,186.41	306.48					
458. Stationery and Printing	6,712.20	5,579.57	1,524.45					
459. Valuation Expenses	6,700.60	5,562.84	1,500.15					
460. Other Expenses	5,446.06	4,480.72	1,009.01					100.00
461. General Joint Facilities	555.67	77.61	17.75		17.75			
General Expenses to service outside of direct locations					12,434.55	4,951.33	3,812.61	3,833.25
Total General Expenses	$106,908.50	$ 89,174.83	$ 24,359.49		12,452.30	4,951.33	3,812.61	3,143.25
Total Operating Expenses	$3,055,980.60	$2,540,615.23	$695,491.51	$ 19,095.72	$344,655.82	$137,231.93	$105,671.34	$ 78,836.70

* Credit-Deduct.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Assignment of Passenger and Baggage Expenses to INTER and INTRA.
Year ending June 30th, 1917.

	Total Passenger and Baggage	Subdivision		Inter	Intra
I. MAINTENANCE OF WAY STRUCTURES	$ 64,164.44				
Account 227-A		$ 2,060.59	Intra Factor 1	$ 368.44	$ 1,794.15
Overheads 201, 229, 265, 269, 271, 275 (in part), 276 and 277		4,823.62	Intra Factor 3	1,387.10	3,435.92
All Other Accounts		57,280.63	Intra Factor 2	16,800.47	40,480.36
II. MAINTENANCE OF EQUIPMENT	56,774.51		Intra Factor 2	16,651.96	40,122.55
III. TRAFFIC EXPENSES	31,934.76				
Account 252, Outside Agencies		12,553.27	Intra Factor 4-A	11,552.87	1,000.50
Account 253, Advertising		3,070.87	Intra Factor 4-B	2,120.74	950.13
Accounts 256 to 258		4,612.03	Intra Factor 3	1,252.71	3,359.32
Account 251, Superintendence		11,698.42	Intra Factor 5	8,686.13	3,012.26
IV. TRANSPORTATION EXPENSES	179,216.55				
Accounts 272 and 276		20,669.62	Intra Factor 1	2,672.58	17,997.05
Overheads 271, 290, 291, 407, 410, 411 412 and 413		6,715.17	Intra Factor 6	1,837.67	4,877.50
All other accounts		151,933.75	Intra Factor 2	44,562.17	107,371.58
VII. GENERAL EXPENSES	12,452.20				
Account 227-B (General).	11.36	12,463.56	Intra Factor 7	4,048.01	8,415.55
				111,938.85	222,716.97
Deduct expenses located to Inter from Intra and add to Inter					
Account 276				5.58	*5.58
Account 412				54.92	*54.92
Account 461				3.75	*3.75
	$244,655.82			$112,003.10	$222,652.72

* Credit-Deduct.

1917

Duluth, South Shore & Atlantic Railway Company.

Earnings. Year ending June 30th, 1917.

				MICHIGAN					
				PASSENGER					
	System	Total	Freight	Total	Sleepers and Diners	Mail and Express	Passenger and Baggage Total	Inter.	Intra.
101 Freight	$2,741,033.27	$2,415,801.69	$2,415,801.69						
102 Passenger	1,033,124.62	887,420.75		$ 887,420.75			$887,420.75	$267,249.35	$620,071.40
103 Excess Baggage	7,797.54	7,094.73		7,094.73			7,094.73	1,885.69	5,209.04
104 Sleeping Cars	44,106.51	24,147.80		24,147.80	$ 24,147.80				
105 Parlor & Chair Cars	4,706.45	4,706.45		4,706.45	4,706.45				
106 Mail	50,579.37	40,477.37		40,477.37		$ 40,477.37			
107 Express	37,367.39	32,995.45		32,995.45		32,995.45			
108 Other Pass Trn Rev	1,810.56	1,601.28		1,601.28			1,601.28	716.57	$84.71
109 Milk	678.24	194.20		194.20			194.20		194.20
110 Switching	21,330.42	13,400.48	13,400.48						
111 Spl. Ser. Trn Rev.	5,703.00	5,250.77	3,077.04	2,173.73			2,173.73	492.77	1,680.96
112 Other Frt. Trn. Rev.	43.00	40.06	40.06						
131 Dining and Buffet	40,042.85	31,865.25		31,865.25	31,865.25				
133 Sta.Trn.& BoatPriv.	600.00	495.46		495.46			495.46	149.28	346.18
134 Parcel Room	463.50	463.50		463.50			463.50	139.65	323.85
135 Storage, Freight	2,935.02	2,813.21	2,813.21						
136 Storage, Baggage	164.55	164.05		164.05			164.05	49.43	114.62
137 Demurrage	14,743.00	12,344.00	12,344.00						
138 Tgh. and Teleph.	816.88	766.62	540.16	226.46			226.46	68.23	158.23
142 Rent of Bldgs., etc §	6,595.08	6,528.23	6,039.61	488.62			488.62	147.22	341.40
143 Misc'lns Dockage..	44,473.79	44,473.79	44,473.79						
Misc. Dockage, Oth.	5,771.03	5,624.39	5,036.06	588.31			588.31	177.26	411.05
151 Jt. Facil. Rev.—Cr.	3,704.39	2,515.65	1,484.21	1,031.44			1,031.44	361.04	670.40
152 Jt. Facil. Rev.—Dr. *	2.62	* 2.62	* 1.85	* .77			* .77	* .23	* .54
	$4,073,573.24	$3,552,182.56	$2,505,048.48	$1,047,134.06	$ 70,719.50	$ 74,472.82	$901,941.76	$271,536.26	$630,405.50

* Credit-Deduct.

§ Rentals on outside property not included $1,114.50.

1917

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Income Account down to Net amount applicable to return on Investment. Passenger Business State of Michigan. Year ending June 30th, 1917.

		Mineral Range Run	Total D. S. S. & A. Passenger	D. S. S. & A. Ry. PASSENGER				Passengers & Baggage	
				Sleepers	Diners	Mail and Express	Passenger and Baggage	Inter-state	Intra-state
1 Earnings			$1,047,134.03	$ 33,854.25	$ 21,965.25	$ 74,472.82	$901,941.76	$271,538.26	$630,403.50
2 Expenses		$10,695.72	666,395.79	137,231.98	105,671.34	78,826.70	344,655.82	112,003.10	232,652.72
3 Net Income		*19,695.72	380,738.29	* 96,377.68	* 72,206.09	* 4,353.88	557,285.94	159,535.16	397,750.78
4 Rent tracks, Ishpeming to Marquette, C.& N.W.Ry.	$1,647.14								
5 Rent tracks, Negaunee to Calumet, C.& N.W.Ry.	6,528.94	957.12							
6 Rent tracks, Champion to Calumet, C.M.& St. P.Ry.	4,106.25	a 737.02	9,.88.19	1,833.45	933.74	1,124.56	6,141.44	1,850.42	4,291.02
7 Rent, Michigamme to Beaufort, $1,200.27 Factor 1-8									
8 Rent. Houghton to Pilgrim $3,252.16 Factor 1-8									
9 Union Dep. tracks, Negaunee $57.00 Factor 1-8									
$4,509.43 Factor 1-8		b	1,044.74	270.54	122.65	148.29	493.26	148.62	344.64
10 Land, Negaunee Union Depot			150.00				150.00	45.20	104.80
		*17,401.53	391,921.22	* 96,273.69	* 72,784.70	* 3,091.03	564,070.64	161,577.40	402,493.24

Income Account down to Net amount applicable to return on Investment. Passenger Business State of Michigan. Year ending June 30th, 1917 (Continued).

11 Hire of Equipment, Locomotives			1,944.32	503.50	246.87	275.98	917.97	276.58	641.39
12 Hire of Equipment, Pass. Cars		c	* 153.37	* 29.45	* 13.80	* 23.84	* 91.28	* 27.50	* 63.78
13 Hire of Equipment, Sleepers				* 1,245.99					
15 Hire of Equipment Work $1,235.19 Factor 1-8	1,235.19	d	286.17	71.76	34.97	40.01	139.43	42.01	97.42
			*17,401.55	392,993.24	* 96,973.37	* 72,516.66	* 2,798.88	565,036.76	161,868.49	403,168.27
16 Taxes, Delf's figures, $187,570.00—To Passenger									
		e*1,409.78	* 49,199.05	* 10,136.63	* 7,805.38	* 5,800.37	* 25,456.67	* 7,670.10	* 17,786.57
			*18,811.36	343,794.29	*107,110.50	* 80,322.04	* 8,599.25	539,580.09	154,198.39	385,381.70

Factor 12-15

* Deduct.
e One-half on 392 and one-half on 401, Intra on earnings.
b Factor 17-23, Intra on earnings.
c Factor 18-19, Intra on earnings.
d Factor 1-20, Intra on earnings.
e Factor 12-17, Intra on earnings.

CHARTS

TOO LARGE FOR FILMING

COMPLAINANT'S EXHIBIT 901

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Additions and Retirements in Michigan from June 30, 1913, to June 30, 1917.

Schedule No. 1—Right of Way and Station Grounds. (1)

ADDITIONS									RETIREMENTS						
Date	Items	Allocn.	Unit Price	%	VALUE Pass.	Frt.	Com.	Total	Date	Items	Allocn.	Master's Unit Price	MASTER'S VALUE Pass.	Com.	Total Rem.
Aug. 1913	St. Ignace Gravel Pit	Com.	Cost 1,200				1,200	1,200							
Oct. 1914	Montreal Sec. Ho. Lot	Com.	Cost 25				25	25							
Sept. 1915	Au Train Sand Pit	Com.	Cost 325				325	325							
Nov. 1916	Eagle Mills Sec. Ho. Lot	Com.	Cost 100				100	100							
	Totals						$ 1,650	$ 1,650							(3)
	Schedule No. 3—Grading.												Frt.		
Aug. 1916	Neg. & Palmer Br. 0.5M. Richmond Mine Conn.	Frt.		100					Apr. 1916	Milwaukee Br. 1.73 M.	Frt.				
	1.83 Ac. Clearing	Frt.	53.00	100		97		97	Apr. 1916	Negaunee Mine Br. .01 M.	Frt.				1/3 Int.
	0.35 Ac. Grub	Frt.	133.00	100		46		46		Total Mine Br. 1.74					
	1,420 C. Y. Earth	Frt.	.40	100		568		568		12 Acr. Clearing		$ 40	480		480
	1,100 C. Y. Loose Rock	Frt.	.67	100		737		737		Grubbing 29.88% 4 Ac.		$100	400		400
	737 C. Y. Solid	Frt.	1.70	100		1,253		1,253		Earth 21,750 C. Y.		30 cts.	6,525		6,525
	130 C. Y. Ditching	Frt.	.40	100		52		52							
						2,753		2,753	June 1916	Bay Mills Br. 0.75 M.	Frt.				
1914	Widening Cuts and Fills	Com.		100			30,307	30,307		4.5 Acr. Clearing		$ 40	180		180
1915	Widening Cuts and Fills	Com.		100			13,588	13,588		1.4 Acrs. Grubbing		$100	140		140
1916	Widening Cuts and Fills	Com.		100			9,207	9,207		Earth 6,000 C. Y.		30 cts.	1,800		1,800
1917	Widening Cuts and Fills	Com.		100			5	5	June 1914	Retaining Wall Cor. Baraga Ave. and Front St. Marquette	Com.			4,521	4,521
							53,107	53,107							
	Less Credit, 1917, Victoria Mg. Co.						3,500	3,500							
	Total						49,607	49,607							
	Totals					2,753	49,607	52,360					9,525	4,521	14,046

Schedule No. 5—Bridges, Trestles and Culverts. (5)

Sept. 1914	Bridge No. 6, Brimley, Steel Viaduct 435' long	Com.					52,599	52,599	Sept. 1914	Bridge No. 6, Brimley	Com.		6,754	6,754
Dec. 1913	Bridge No. D-51, Iron Bridge, Steel Viaduct 191' long	Com.					18,675	18,675	June 1916	Bridge No. 226, Negaunee	Com.		1,452	1,452
Aug. 1915	Bridge No. 317, Bruce's Crossing, 51.5' 2nd Hd. Dock Girder added on West end	Com.	Cost $3,362	85			2,858	2,858	Dec. 1913	Bridge D-51, Iron Bridge	Com.		4,124	4,124
Feb. 1914	Bridge No. 335, Thomaston, Steel Viaduct 493' long	Com.					48,003	48,003	May 1916	Bridge No. 308, Kenton	Com.		3,557	3,557
June 1916	Bridge No. 308, Kenton, 306' long, 1.52' Pl. Girder	Com.					10,338	10,338	Feb. 1914	Bridge No. 335, Thomaston	Com.		7,748	7,748
Jan. 1916	Bridge No. 334, Woodroy, 297' long, 1-43' Pl. Gr. 2nd Hd	Com.					10,077	10,077	Oct. 1913	Bridge No. 348, State Line	Com.		1,560	1,560
Oct. 1913	Bridge No. 348, State Line, Steel Gr. 62' long, ½ value in Michigan	Com.					4,089	4,089		Total Bridges	Com.		25,195	25,195
May 1917	Bridge D-28, L'Anse, New Conc. Br. Seats	Com.	Cost 1,556	100			1,556	1,556	June 1915	Trestle No. 99	Com.		144	144
June 1915	Trestle No. 99, M. P. 81.8, Pile Trestle 42' long	Com.					945	945	Oct. 1914	Trestle No. 106	Com.		144	144
Oct. 1914	Trestle No. 106, Pile Trestle 42' long	Com.					843	843	June 1915	Trestle No. 061	Com.		465	465
May 1915	Trestle M. P. 89.7 Pile Trestle 12' long	Com.					233	233	Jan. 1914	Trestle No. 309	Com.		7,154	7,154
April 1914	Trestle M. P. 82.74 Pile Trestle 8' long	Com.					248	248	Dec. 1914	Trestle No. 329	Com.		857	857
April 1914	Trestle M. P. 83.71 Pile Trestle 8' long	Com.					248	248	Nov. 1915	Trestle No. 344	Com.		2,651	2,651
Jan. 1914	Trestle No. 309, 633' long	Com.	Cost 15,041	80			12,032	12,032		Total Trestles	Com.		11,415	11,415
Dec. 1914	Trestle No. 332, 112' long	Com.	Cost 1,869	80			1,495	1,495	1913 to 1916	Culverts 43 Box Culverts, as per detail sheet	Com.		3,933	3,933
1913—1917	73 Conc. Pipe Culverts	Com.					29,248	29,248	1917	18 Box Culverts, as per detail sheet	Com.		4,219	4,219
1913—1917	129 Timber Culverts	Com.					15,226	15,226							
1913—1917	4 Timber Culverts	Frt.			644			644					8,152	8,152	
	Totals				644		208,713	209,357					44,762	44,762	

COMPLAINANT'S EXHIBIT 201

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Schedule No. 6—Ties.

Additions and Retirements in Michigan from June 30, 1913, to June 30, 1917.

ADDITIONS

Date	Items	Allocn.	Unit Price	%	VALUE Pass.	Frt.	Com.	Total
Aug. 1916	1,330 Ties, Richmond Mine Conn.	Frt.	.448 cts.	100		605		605
	Totals					605		605

RETIREMENTS

Date	Items	Allocn.	Master's Unit Price	MASTER'S VALUE Pass.	Frt.	Com.	Total
	6,723 Ties in 55% Con.	Frt.	39 cts.		1,442		1,442
April 1916	Milwaukee Mine Br. 1.75						
April 1916	Negaunee Mine Br. .01						
June 1916	Bay Mills Br. .73						
	Total 2.49						
	@2,700 Ties per Mile.						
					1,442		1,442

(6)

Schedule No. 7—Rail.

Fiscal Yr.	Main Line	Tons						
1914	New Rail	5,805.26	Com.	$40.52	93.5		235,229	235,229
1914	2nd Hd. Rail	46.20	Com.	37.31	65		1,724	1,724
1915	New Rail	1,048.42	Com.	40.69	95		42,660	42,660
1915	2nd Hd. Rail	180.08	Com.	37.31	65		6,719	6,719
1916	New Rail	10.06	Com.	40.97	97.5		412	412
1916	2nd Hd. Rail	527.83	Com.	37.31	65		19,693	19,693
1917	New Rail	2,789.50	Com.	41.25	100		115,067	115,067
1917	2nd Hd. Rail	511.73	Com.	37.31	65		19,093	19,093
	Branches	Tons						
1914	Rel. Rails	290.41	Frt.	35.06	45	10,182		10,182
1915	Rel. Rails							
1916	Rel. Rails	240.43	Frt.	35.06	45	8,429		8,429
1917	Rel. Rails							
	Totals					18,611	440,597	459,208

Main Line	Tons	Con.						
60 lb. Rail	3,358	in 20%	Com.	$17.25			57,925	57,925
60 lb. Rail	3,442	in 50%	Com.	24.36			83,847	83,847
70 lb. Rail	229	in 20%	Com.	17.25			3,950	3,950
70 lb. Rail	886.8	in 65%	Com.	25.06			22,223	22,223
72 lb. Rail	45	in 20%	Com.	17.25			776	776
72 lb. Rail	431.31	in 65%	Com.	25.06			10,807	10,807
80 lb. Rail	80.45	in 95%	Com.	29.53			2,376	2,376
	8,472.56 Tons							
Branches	Tons	Con.						
60 lb. Rail	728.80	in 20%	Frt.	$17.25		12,573		12,573
						12,573	181,904	194,477

(7)

Schedule No. 8—Track Fastenings.

Angle Bars	625.12 Tons	Com.	$56—$54.20	95		33,881	33,881
Bolts	49.5 Tons	Com.	86.22	95		4,055	4,055
Nutlocks	114 M	Com.	12.75	95		1,381	1,381
Rail Br.	8,872	Com.	.19	95		1,601	1,601
Spikes	5,678 Cwt.	Com.	3.45	95		18,610	18,610
Angle Bars	23.8 Tons	Frt.	$56—$36.20	45	862		862
Bolts	2.5 Tons	Frt.	86.22	95	205		205
Nutlocks	6 M	Frt.	12.72	55	43		43
Rail Braces	41	Frt.	.19	85	66		66
Spikes	262 Cwt.	Frt.	3.45	95	2,035		2,035
Totals					2,035	59,528	61,563

Angle Bars	531.95 Tons	Frt.	60%—$24.40			12,979	12,979
Bolts	1,072 Cwt.	Frt.	60%— 2.60			1,672	1,672
Nutlocks	124 M	Frt.	60%— 5.20			387	387
Rail Braces	8,872	Frt.	95%— .115			969	969
Spikes	5,676 Cwt.	Frt.	65%— 2.10			7,748	7,748
Angle Bars	44.94 Tons	Frt.	50%—$22.00		989		989
Bolts	94 Cwt.	Frt.	50%— 2.60		122		122
Nutlocks	11 M	Frt.	50%— 5.20		28		28
Rail Braces	774	Frt.	95%— .115		85		85
Spikes	496 Cwt.	Frt.	65%— 2.10		677		677
					1,901	23,755	25,656

(8)

COMPLAINANT'S EXHIBIT 201

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY.

Schedule No. 9, Frogs, Switches and Crossings.

Additions and Retirements in Michigan From June 30, 1913, to June 30, 1917. (9)

ADDITIONS.

Date	Items	Allocn.	Unit Price	%	VALUE Pass.	Frt.	Com.	Total
	33 Spl. Sw. Spr. F	Com.	$ 291.45	95			9,137	9,137
	70 Spl. Sw. Spr. F	Frt.	291.45	95		19,381		19,381
	32 Spl. Sw. Rig F	Com.	251.86	95			7,656	7,656
	72 Spl. Sw. Rig F	Frt.	251.86	95		17,227		17,227
	61 Spl. Sw. Rig F	Frt.	251.86	55		8,450		8,450
	Totals					45,058	16,793	61,851
	Schedule No. 10—Ballast.							
Aug. 1916	Neg. & Palmer Br., 0.5 M. Richmond Mine Conn. 9,000 Y. Sand Ballast	Frt.	$0.45			405		405
	Totals					405		405
	Schedule No. 11—Track Laying and Surfacing.							
Aug. 1916	Negaunee & Palmer Br., Richmond Mine Conn. 0.5 Miles	Frt.	$000			450		450
	Totals					450		450
	Schedule No. 12—Fencing.							
	2.80 Miles Barb wire Fence	Com.	$241.32	95			642	642
	25.56 Miles Woven wire Fence	Com.	282.12	95			6,850	6,850
	8,824 Lin. ft. per 8' sn. fnc	Com.	.32	95			2,683	2,683
	2,240 Lin. ft. per 8' sn. fnc	Com.	.30	95			638	638
	Totals						$10,813	$10,813
	Schedule No. 13—Crossings, Signs and Cattle Guards.							
	12 St. and Highway Crossgs	Com.	$22.13	95			252	252
	24 Cattle Gds. and Wings	Com.	32.72	95			746	746
	24 Whistle Posts	Com.	1.25	95			28	28
	24 Crossing Signs	Com.	5.00	95			114	114
	32 Station Signs	Com.	2.25	95			68	68
	60 Station 1 Mile Signs	Com.	2.25	95			128	128
	315 Curve Signs	Com.	.25	95			75	75
	425 Mile Signs	Com.	.35	95			142	142
	Totals						1,553	1,553

RETIREMENTS.

Date	Items	Allocn.	Master's Unit Price	Pass.	MASTER'S VALUE Frt.	Com.	Total
	10 Spl. Sw. Spr. F. in 65% Con	Com.	199.20—129.48			1,295	1,295
	23 Spl. Sw. Rig F. in 65% Con	Com.	172.80—112.32			2,583	2,583
	23 Spl. Sw. Spr. F in 65% Con	Com.	199.20—129.48			2,978	2,978
	65 Spl. Sw. Rig F in 55% Con	Frt.	172.80— 95.04		6,178		6,178
	5 Stub. Sw. Rig. in 55% Con	Frt.	135.35— 74.44		372		372
	1 Dia. Gross. in 60% Con	Com.	311.60—186.96			187	187
	Totals				6,550	7,043	13,593
							(10)
Apr. 1916	Milwaukee Branch 1.73 M.						
	Negaunee Mine Branch .01 M. 1/3 Int.						
June 1916	Bay Mills Branch .75 M.						
	2.49 M.	Frt.					
	2.49 Miles Sand Ballast, at 2,000 Yds. per Mile— 4,980 Cu. Yds	Frt.	$0.30		1,494		1,494
	Totals				1,494		1,494
							(11)
Apr. 1916	Milwaukee Br. 1.73 M.						
	Negaunee Mine Br. .01 1/3 Int.						
June 1916	Bay Mills Br. .75						
	Total 2.49	Frt.	$600.00		1,494		1,494
	Totals				1,494		1,494
							(12)
	No Retirements.						
							(13)
	5 Wooden Pit C. G. 50% Con	Com.	$60.00			150	150
	19 Station Signs, 90% Con	Com.	2.00			34	34
	38 1 Mile Signs, 70% Con	Com.	2.00			53	53
	3 Wooden Pit C. G., 50% Con	Frt.	60.00		90		90
	Totals				90	237	327

COMPLAINANT'S EXHIBIT 201

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY.

Schedule No. 14—Interlocking and Signal Apparatus.

Additions and Retirements in Michigan from June 30, 1913, to June 30, 1917.

(14)

Date	Items	ADDITIONS. Alloen.	Unit Price	%	VALUE Pass.	Frt.	Com.	Total	Date	Items.	RETIREMENTS. Alloen.	Master's Unit Price	MASTER'S VALUE. Pass.	Frt.	Com.	Total
Feb. 1917	Marquette Yard, 3 Elec. Semaphores	Com.	Ac. Cost	100			525	525	Feb. 1917	Marquette Yard, 3 Semaphores in 80% Con.	Com.				120	120
										Electric Signals, 85% Con.	Com.				510	510
	Totals						525	525							630	630

Schedule No. 15—Telegraph and Telephones.

(15)

No Additions.

No Retirements.

Schedule No. 16—Side Tracks.

(16)

	17.93 Miles $6,850		122,820							12.45 Miles $51,916						
	Less 205 Turnouts 11	Frt.	2,255		120,565			120,565		Less 130 Turnouts 1,287						
										$50,629	Frt.	$4,170		50,629		50,629
	4.15 Miles $6,850		28,427							1.68 Miles $ 7,005						
	Less 56 Turnouts 11		638				27,789	27,789		Less 21 Turnouts 208						
		Com.								$ 6,797	Com.	$4,170			6,797	6,797
	Totals				120,565		27,789	148,354						50,629	6,797	57,426

(17)

Schedule No. 17—Station Buildings and Fixtures.

June 1916	Wetmore Depot	Com.	Cost	2,938	100			2,938	2,938	June 1915	Wellsburg Depot	Pass.		315		315
										Apr. 1916	Wetmore Depot	Pass.		412		412
June 1916	Moran Depot	Com.	Cost	2,757	100			2,757	2,757	June 1916	Moran Depot	Com.			300	300
										Dec. 1915	Sault Transfer, ½ Int	Frt.			1,761	1,761
July 1916	Hurlbert Depot	Com.	Cost	54	100			54	54	July 1913	Strongs Depot	Com.			288	288
										June 1915	Kitchi Depot	Com.			384	384
Dec. 1915	Sault Ste. Marie, St. Mary's Transfer, D. S. S. & A. Ry., ½ Int	Frt.	Cost	2,808	97	2,724			2,724	June 1916	Trout Creek Depot	Com.			1,071	1,071
										June 1916	Trout Creek Platform	Com.			127	127
July 1913	Strongs Depot	Com.	Cost	483	95			458	458	June 1916	Bruces Crossg. Depot	Com.			720	720
										June 1916	Bruces Crossg. Platform	Com.			81	81
June 1916	Trout Creek Depot	Com.	Cost	3,479	100			3,479	3,479	Oct. 1914	Thomaston Depot	Pass.		1,800		1,800
June 1916	Bruces Crossg. Depot	Com.	Cost	2,703	100			2,703	2,703	Oct. 1914	Thomaston Platform	Pass.		188		188
Feb. 1916	Thomaston Combined Depot, Hotel and Restaurant	Com.	Cost	11,553	97			11,206	11,206	Apr. 1916	Ozark Depot	Com.			66	66
Apr. 1917	Ozark Depot	Com.	Cost	94	100			94	94					2,715	1,761	3,037	7,513
May 1917	Falls Depot	Frt.	Cost	102	100	102			102							
May 1917	Montreal Depot	Frt.	Cost	15	100	15			15							
June 1917	Michigamme Depot, 1 Waiting Room added	Com.	Cost	698	100			698	698							
June 1917	Gladys Shelter Depot	Com.	Cost	103	100			103	103							
	Totals					2,841		24,490	27,331							

COMPLAINANT'S EXHIBIT 201

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Schedule No. 19, Shops, Engine Houses and Turntables.

Additions and Retirements in Michigan From June 30, 1913, to June 30, 1917.

ADDITIONS

Date	Items	Allocn	Unit Price	%	VALUE Pass.	Frt.	Com.	Total
Nov. 1913	St. Ignace Round Ho. 1 stall added and 2 others lengthened, new Pits, new 75' Turntable and Pit	Com.	Cost 12,101	95			11,496	11,496
1913	Marquette New Round Ho. Added cost of Constr'n after June 30, 1913	Com.	Cost 26,550	95			25,222	25,222
Jan. 1915	Marquette Upper Yard Old Round House. 2 Conc. Drop Pits added	Com.	Cost 773	100			773	773
June 1916	Marquette Upper Yard. 5 Car Bodies for Supply Store	Com.	Cost 250	100			250	250
Dec. 1915	South Ishpeming. 2d Hand Turntable, Sewer, etc	Frt.	Cost 1,847	97		1,791		1,791
1913	Thomaston Round Ho. Added Cost of Constr'n after June 30, 1913	Com.	Cost 19,652	95			18,669	18,669
1917	Marquette. New Shed for Storing Lumber	Com.	Cost 333	100			333	333
1917	Marquette Shop. 3 Car Bodies for Supplies	Com.	Cost 44	100			44	44
1917	Ishpeming Round House. Electric Lights installed	Frt.	Cost 74	100		74		74
1917	St. Ignace Round House. Electric Lights installed	Com.	Cost 140	100			140	140
1917	Marquette Shops. Flue Welding Shop	Com.	Cost 785	100			785	785
	Totals					1,865	57,712	59,577

RETIREMENTS

(19)

Date	Items	Allocn	Master's Unit Price	MASTER'S VALUE Pass.	Frt.	Com.	Total
Nov. 1913	St. Ignace Turntable and Pit	Com.				1,760	1,760
1915	Marquette Lower Yard. Blacksmith Shop	Com.				750	750
1916	Marquette Lower Yard. 7 Stalls of 14 Stall Rd. Ho.	Com.				6,700	6,700
1914	Marquette, Lake St. Brick Round House	Com.				3,200	3,200
1914	Marquette, No. 1 Dock. Tool House	Com.				48	48
1916	L'Anse Round Ho. and Machine Shop	Com.				2,528	2,528
1917	So. Ishpeming. Turntable	Frt.			2,320		2,320
				2,320	14,986		17,306

Schedule No. 20—Shop Machinery and Tools.

(20)

Date	Items	Allocn	Unit Price	%	VALUE Pass.	Frt.	Com.	Total
July 1913	One 1½ Cyclone Hoist	Com.	Cost 40	95			38	38
Sept. 1913	One 7½ H. P. Elec. Motor	Com.	Cost 157	95			149	149
Sept. 1915	One 42 x 42-12' Planer	Com.	Cost 3,289	100			3,289	3,289
Sept. 1916	One Cutting Machine	Com.	Cost 98	100			98	98
April 1916	One 32" Drill Press	Com.	Cost 150	100			150	150
April 1916	One 26 x 12 Eng. Lathe	Com.	Cost 300	100			300	300
April 1916	One Tube Welding Furnace	Com.	Cost 220	100			220	229
June 1916	One Cutting Blow Pipe	Com.	Cost 150	100			150	150
May 1917	One Machine Lathe	Com.	Cost 400	100			400	400
May 1917	One Drill Press	Com.	Cost 100	100			100	100
	Totals						4,903	4,903

No Retirements

(21)

Schedule No. 21—Roadway andConstruction Tools.

No Additions

No Retirements

COMPLAINANT'S EXHIBIT 201

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Schedule No. 22.—Water Stations. (22)

Additions and Retirements in Michigan From June 30th, 1913, to June 30th, 1917.

Date	Items	ADDITIONS Alloc	Unit	Price	%	VALUE Frt.	Pass.	Com.	Total
Dec. 1915	Seney—5 H. P. Gas. Eng. and Pump, Pump Ho. and Intake Pipe	Com.	Cost	$1,317	95			1,251	1,251
Dec. 1915	Creighton—5 H. P. Gas. Eng. and Pump, Pump Ho. and Intake Pipe	Com.	Cost	1,366	95			1,298	1,298
Jan. 1915	No. Ishpeming—New Tub and Frm., on old Foundation	Com.	Cost	1,290	95			1,234	1,234
Oct. 1913	So. Ishpeming—New Tub and Frm., on old Foundation	Com.	Cost	1,492	95			1,416	1,416
Sept. 1914	Thomaston—New Pump Ho	Com.	Cost	720					
	Thomaston—New Tub and Frame on old Foundation	Com.	Cost	1,793					
				2,513	95			2,387	2,387
Sept. 1915	Trout Creek—New Tub and Frm. on old Foundation	Com.	Cost	1,663	95			1,580	1,580
June 1917	Bissell—Additional Well	Com.	Cost	605	95			575	575
	Totals							9,741	9,741

Date	Items	RETIREMENTS Alloc	Master's Unit Price	MASTER'S VALUE Pass.	Frt.	Com.	Total	Rem.
Dec. 1915	Seney—Pump Ho 60% Con.	Com.				151		
	Seney—Pump and Boiler 55% Con.	Com.				248		
	Seney—Supply Pipe 80% Con.	Com.				36	435	
Dec. 1915	Creighton—Pump Ho 60% Con.	Com.				143		
	Creighton—Pump and Boiler 55% Con.	Com.				248		
	Creighton—Supply Pipe 80% Con.	Com.				36	427	
Jan. 1915	No. Ishpeming—Tank, Tub and Frm 80% Con.	Com.				1,440		
Oct. 1913	So. Ishpeming—Tank, Tub and Frm 50% Con.	Com.				850	2,290	
Sept. 1915	Trout Creek—Tank, Tub and Frm 82% Con.	Com.				1,533	1,533	
Sept. 1914	Thomaston—Pump Ho. in 80% Con.	Com.				224		
	Thomaston—Tank, Tub and Frm 80% Con.	Com.				1,496	1,720	
	Totals					6,405	6,405	

Schedule No. 23—Fuel Stations. (23)

Date	Items	Alloc	Unit	Price	%	Frt.	Pass.	Com.	Total
Feb. 1915	Trout Creek—Fairbanks Morse Co. 100-Ton Capacity Coal Chute	Com.	Cost	5,483	97			5,318	5,318
May 1917	Seney—Air Hoist at old Coaling Station	Com.	Cost	363	100			363	363
	Totals							5,681	5,681

Date	Items	Alloc	Master's Unit Price	Pass.	Frt.	Com.	Total	Rem.
Feb. 1915	Ewen—Coaling Station	Com.				3,665	3,665	
	Totals					3,665	3,665	

Schedule No. 26—Docks and Wharves. (26)

Stipulated that the value of Schedule No. 26 is as follows:

	C.R.	Con. %	P.V.
No. 5 Dock, Marquette	447,129	50	223,564
Ferry Dock Baraga	750	75	562
Dock, Houghton	2,884	34	980
Walk, St. Ignace	1,100	40	440
Car Ferry Dock, St. Ignace	40,540	35	14,189
Other Docks, St. Ignace	106,973	6 1/3	6,739
M. T. Co. Dock, St. Ignace	7,658	26	1,991
Total	$607,034		$248,465
Allocation:			
Freight	$233,836		
Common	14,189		
Passenger	440		
Total	$248,465		

COMPLAINANT'S EXHIBIT 201

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Schedule No. 27—Electric Plants.

Additions and Retirements in Michigan from June 30, 1913, to June 30, 1917

ADDITIONS

Date	ITEMS	Allocn	Unit Price	%	VALUE Pass	Frt.	Com.	Total
May 1916	Thomaston, Mich. One 10 H. P. Type Y Elec. Oil Eng. Std. Equipment Generator. Wiring and Labor, Complete with Eng. Foundation Eng. and Generator 2nd Hd.	Com.	Ac. Cost	100			1,289	1,289
	Totals						1,289	1,289

Schedule No. 28—Miscellaneous Structures.

Date	ITEMS	Allocn	Unit	Price	%	Pass	Frt.	Com.	Total
June 1915	Raco. Agent's House	Com.	Cost	408	95			388	388
Dec. 1915	St. Ignace Tool House	Com.	Cost	150	90			135	135
Apr. 1915	Marquette Tool House	Frt.	Cost	50	100		50		50
Apr. 1915	Marquette Store House	Com.	Cost	150	100			150	150
May 1915	Marquette Tool House	Com.	Cost	75	100			75	75
Sept. 1913	Sault Scales—Our 1/2 Int.	Frt.	Cost	1,072	95		1,018		1,018
Dec. 1914	Soo Jct. Track Scales	Frt	Cost	1,320	95		1,254		1,254
June 1916	Eagle Mills Sec. Ho	Com.	Cost	3,061	100			3,061	3,061
May 1915	Ishpeming Tool House	Com.	Cost	75	100			75	75
Mar. 1916	Nestoria Tool Ho	Com.	Cost	75	100			75	75
Mar. 1916	Keweenaw Bay Tool Ho	Com	Cost	37	100			37	37
Apr. 1914	Negaunee Tool House	Frt.	Cost	150	95		142		142
Apr. 1915	Summit Std. Tool House	Com.	Cost	75	100			75	75
May 1916	Isle Royal Tool Ho.	Com.	Cost	75	100			75	75
June 1916	Ishpeming Scales	Frt	Cost	1,972	100		1,972		1,972
June 1915	Vermilac Tool House	Com.	Cost	48	90			43	43
July 1915	Kitchi Tool House	Com.	Cost	75	95			71	71
July 1914	Thomaston Hd. Car Ho	Com.	Cost	81	95			77	77
	Thomaston Tool House	Com.	Cost	50	90			45	45
May 1915	Montreal Tool House	Com.	Cost	150	95			142	142
1917	Vermilac Pumper's Dwl	Com.	Cost	137	100			137	137
1917	Marquette Auto Platform	Frt	Cost	79	100		79		79
1917	Marquette Oil Tank	Com.	Cost	1,020	100			1,020	1,020
1917	Marquette Store Ho. Office	Com.	Cost	50	100			50	50
1917	Strongs Sec. Ho	Com.	Cost	638	100			638	638
1917	Marquette No. 5 Sentry	Frt	Cost	60	100		60		60
1917	Houghton Bdg Ho. El. Lts.	Frt.	Cost	60	100		60		60
1917	St. Ignace Scales	Frt	Cost	2,034	100		2,034		2,034
1917	Nelsonville Tool Ho	Com.	Cost	190	100			190	190
1917	Kenton Tool Ho.	Com.	Cost	31	100			31	31
1917	Brimley Tool Ho	Com.	Cost	27	100			27	27
1917	Seney Sec. Ho.	Com.	Cost	591	100			591	591
	Totals						6,669	7,208	13,877

RETIREMENTS

Date	ITEMS	Allocn	Master's Unite Price	MASTER'S VALUE Pass.	Frt.	Com.	Total	
	No Retirements.							
Sep. 1913	Sault Ste. Marie Track Scales and Scale House our 1/2 Int.	Frt.			344		344	
1915	Marquette Lower Yard Sand House	Com.				140	140	
1916	Humboldt Sand House	Com.				176	176	
May 1915	Ishpeming Old Tool House	Com.				89	89	
June 1916	Ishpeming Old Scales	Frt.			882		882	
July 1915	Kitchi Tool House	Com.				113	113	
May 1916	Thomaston Cottage No. 1 $2,125 Addition 1,140	Com.				3,265	3,265	Burned
July 1914	Thomaston 2 Tool Ho	Com.				138	138	
Sept. 1913	Covington Building Called Office	Com.				60	60	Sold
1917	St. Ignace Track Scales	Frt			1,008		1,008	
1917	Creighton Tool Ho	Com.				92	92	
1917	Kenton Tool House.	Com.				94	94	
1917	Brimley Tool Ho	Com.				82	82	
					2,234	4,249	6,483	

COMPLAINANT'S EXHIBIT 210

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Schedule No. 29—Engineering on Road and Structures.

(29)

ADDITIONS		RETIREMENTS	
Passenger	$	Passenger	$ 89
Freight	5,915	Freight	3,033
Common	27,076	Common	9,959
Total	$ 32,991	Total	$ 13,081

Additions and Retirements in Michigan from June 30, 1913, to June 30, 1917.

Schedule No. 30—Locomotives.

(30)

ADDITIONS

Date	Items	Alloca	Unit Price	%	VALUE Pass.	Frt.	Com.	Total
1913	Engine No. 552	Pass.	26,405	90				23,765
1913	Engine No. 553	Pass.	26,405	90				23,765
1913	Engine No. 554	Pass.	26,405	90				23,765
1913	Engine No. 700	Frt.	25,985	90				23,386
1913	Engine No. 701	Frt.	25,985	90				23,386
1913	Engine No. 702	Frt.	25,985	90				23,386
1913	Engine No. 703	Frt.	25,985	90				23,386
1913	Engine No. 704	Frt.	25,985	90				23,386
1913	Engine No. 705	Frt.	25,985	90				23,386
1913	Engine No. 706	Frt.	25,985	90				23,386
1913	Engine No. 707	Frt.	25,985	90				23,386
1913	Engine No. 708	Frt.	25,985	90				23,386
1913	Engine No. 709	Frt.	25,985	90				23,386
1913	Engine No. 710	Frt.	25,985	90				23,386
1913	Engine No. 711	Frt.	25,985	90				23,386
							Total	351,927
	Michigan Value							306,910
	Allocations							
	Passenger				73,660			73,660
	Freight					233,250		233,250
	Totals				73,660	233,250		306,910

RETIREMENTS

Date	Items	Alloca	Master's Unit Price	MASTER'S VALUE Pass.	Frt.	Com.	Total	Remarks
Sept. 1915	Engine No. 12		$3,060				3,060	Sold
May 1915	Engine No. 14		2,750				2,750	Sold
April 1914	Engine No. 40		2,000				2,000	Sold
June 1917	Engine No. 41		3,835				3,835	Sold
June 1917	Engine No. 43		3,835				3,835	Sold
June 1917	Engine No. 44		3,835				3,835	Sold
June 1917	Engine No. 46		3,835				3,835	Sold
Oct. 1915	Engine No. 50		3,535				3,535	Scrapped
Oct. 1916	Engine No. 61		3,737				3,737	Sold
March 1916	Engine No. 42		3,835				3,835	Sold
April 1914	Engine No. 80		3,741				3,741	Scrapped
May 1916	Engine No. 82		3,901				3,901	Sold
Sept. 1913	Engine No. 111		5,251				5,251	Sold
May 1915	Engine No. 205		4,395				4,395	Sold
Oct. 1913	Engine No. 208		4,200				4,200	Sold
Mar. 1916	Engine No. 403		5,892				5,892	Sold
June 1915	Engine No. 404		5,755				4,755	Sold
July 1914	Engine No. 405		4,755				4,755	Sold
						Total	71,156	
	Michigan Value Allocated as per detail sheet			16,182	48,162		64,344	Mich.
				16,182	48,162		64,344	

Schedule No. 31—Passenger Cars.

(31)

1916	1st Class Coach 210	Pass.	8,065	50	4,032		4,032	
	Assigned between Michigan and Wisconsin, as follows:							
	Michigan—83.55% at $4,032				3,369		3,369	
	Totals				3,369		3,369	

1916	Diner No. 303	Pass.	2,700	2,700			2,700	Rebuilt
	Assigned between Michigan and Wisconsin, as follows:							
	This car was not assigned to Wisconsin, see page 406 of Comparison.							
				2,700			2,700	

COMPLAINANT'S EXHIBIT 201

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY.

Additions and Retirements in Michigan From June 30, 1913, to June 30th, 1917.

Schedule No. 32—Freight Cars.

ADDITIONS.

Date	Items	No. of Cars	Allocn.	Unit Price	%	VALUE Pass.	Frt.	Com.	Total
	Box Cars 3510- 3581	8	Frt.	810	94.5		6,577		6,577
	Box Cars 11600	1	Frt.	1,360	94.5		1,285		1,285
1917	Box Cars 11800-11999	200	Frt.	1,360	100		272,000		272,000
							New		
	Flat Cars 1825-1879	14	Frt.	621	94		8,172		8,172
1917	Flat Cars 12202-12401	200	Frt.	1,057	100		211,400		211,400
							New		
1915	Gondola Cars 10040-10139	2	Frt.	1,223	88		2,152		2,152
1917	Refrigerators 5035-5044	10	Frt.	1,842	100		18,420		18,420
							New		
1913	Caboose 8W. 570-572	3	Frt.	1,225	88		3,234		3,234
1917	Caboose 8W. 573-574	2	Frt.	1,225	100		2,450		2,450
							New		
1913	Ore Cars 9000-9399	400	Frt.	Add ⅛ of value, $2,050 each	80		437,333		437,333
	Total						$963,023		$963,023
	Deduct for 200 Box Cars, 200 Flat Cars and 10 Refrigerators, which were not in use during entire year of 1917. See details						$397,044		$397,044
							$565,979		$565,979
	Assigned between Michigan and Wisconsin, as follows:								
	Michigan 84.93%								
	Wisconsin 15.07%								
	100%								
	84.93% at $565,979						$480,686		$480,686
	Totals						$480,686		$480,686

RETIREMENTS.

Date	Date	No. of Cars	Allocn.	Master's Unit Price	MASTER'S VALUE Pass.	Freight	Com.	Total
1913	Box Cars 3600-4354	66	Frt.	229.20		15,127		15,127
to	Box Cars 8000-8198	50	Frt.	229.20		11,460		11,460
1916	Box Cars 8200-8598	136	Frt.	229.20		31,171		31,171
	Box Cars 4500-45198	47	Frt.	229.20		10,772		10,772
	Box Cars 11000-11199	3	Frt.	406.26		1,219		1,219
	Box Cars 11200-11599	9	Frt.	519.48		4,675		4,675
1913	Flat Cars 100[illegible]1449	33	Frt.	159.20		5,254		5,254
to	Flat Cars 145[illegible]793	5	Frt.	159.20		796		796
1916	Flat Cars 180[illegible]223	2	Frt.	159.20		318		318
1916	Gondola Cars 1829-1880	19	Frt.	239.37		4,548		4,548
	Gondola Cars 2001-2024	4	Frt.	231.00		924		924
1916	Refrigerators 5000-5014	1	Frt.	242.00		242		242
1916	Charcoal Cars 1881-1885	1	Frt.	176.00		176		176
1916	Coal Cars 800-834	20	Frt.	177.20		3,544		3,544
1916	Caboose 4W 501	1	Frt.	220.00		220		220
	Caboose 4W 502-503	1	Frt.	220.00		220		220
	Caboose 4W 505-510	2	Frt.	220.00		440		440
	Caboose 4W 520-521	1	Frt.	247.50		247		247
1916	Ore Cars 03700-04213	138		198.89		27,448		27,448
	Ore Cars 04214-04264	28		355.68		9,959		9,959
	Ore Cars 04265-04274	5		355.68		1,778		1,778
	Ore Cars 04275-04283	5		355.68		1,778		1,778
	Ore Cars 7000-7040	3				596		596
	Ore Cars 7100-7500	26		256.20		6,661		6,661
	Total					139,573		139,573
	Assigned between Michigan and Wisconsin, as follows:							
	Michigan 84.13%							
	Wisconsin 15.87%							
	100.00%							
	84.13% of $139,573— Page 411—Comparison:					117,522		117,522
						$117,522		$117,522

COMPLAINANT'S EXHIBIT 201

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Schedule No. 33—Miscellaneous Equipment.

Additions and Retirements in Michigan from June 30, 1913, to June 30, 1917.

ADDITIONS

Date	Items	No. of Cars	Allocn.	Unit Price	%	VALUE Pass.	Frt.	Com.	Total
1916	Widener No. 713	1	Com.		100			400	400
	Widener No. 728	1	Com.		100			400	400
1915	Bdg. Cars 734-744	6	Com.		100			400	400
	Bdg. Cars 778-788	1	Com.		100			680	680
1916	Snow Spreader 795	1	Com.		100			575	575
1916	Tool Car 796	1	Com.		100			575	575
	Tool Car 900	1	Com.		100			1,000	1,000
1916	Water Tank Car 797	1	Com.		100			575	575
1915	Paint Car 798	1	Com.		100			939	939
1916	Ice Cutter 799	1	Com.		100			5,023	5,023
1916	Russell Snow Plow 901 Cost	1	Com.		100			10,967	10,967

Assigned between Michigan and Wisconsin, as follows:

Michigan	82.13%								
Wisconsin	17.87%								
Total	100.00%								
82.13% of $10,967—								9,007	9,007
Totals								9,007	9,007

RETIREMENTS

Date	Items	No. of Cars	Allocn.	Master's Unit Price	MASTER'S VALUE Pass.	Frt.	Com.	Total	Remarks
1913 to 1916	Bdg. Cars 708-729	2	Com.	$265.00			530	530	
	Bdg. Cars 735-747	5	Com.	270.00			1,350	1,350	
	Bdg. Cars 748	1	Com.	264.00			264	264	
	Bdg. Cars 3513-4336	22	Com.	265.00			5,830	5,830	
1913 to 1916	Ditcher 720	1	Com.	700.00			350	350	
1913 to 1916	Locomotive Plows	12	Com.	90.00			1,080	1,080	
	Locomotive Coal Covers	12	Com.	30.00			360	360	
							9,764	9,764	

Assigned between Michigan and Wisconsin, as follows

Michigan	81.87%								
Wisconsin	18.13%								
Total	100.00%								
81.87% of $9,764—								8,994	8,994
								8,994	8,994

Schedule No. 34—Ferries and Steamships.

Stipulated that the value of Schedule 34 is as follows:

	C. R.	%	P. V.
Steamer Chief Wawatam—1/3 interest	$130,000	75	$97,500
Steamer Ste. Marie—1/3 interest	93,000	80	74,400
Total			$171,900

All allocated to Freight

No additions or retirements in this Schedule.

Schedule No. 35—Engineering on Equipment

Additions		Retirements	
Passenger	$ 2,003	Passenger	$ 377
Freight	18,562	Freight	3,314
Com.	234	Com.	180
	$20,799		$ 3,871

Schedule No. 37—Contingencies

No Additions or Retirements.

COMPLAINANT'S EXHIBIT 201

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY

Schedule No. 36—Terminals

Additions and Retirements in Michigan from June 30, 1913, to June 30, 1917.

ADDITIONS

Date	ITEMS	Allocn	Unit Price	%	VALUE Pass.	Frt.	Com.	Total
Apr. 1917	Sault Union Depot Co. 72' Extn. to Freight Depot and 35 x 30' Extn. to Platform	Frt.	Cost to 6/30-17	100		2,214		2,214
1914	New Brick Platform and Conc. Walks around Pass. Station	Pass.	Cost $ 4,372	95	4,153			4,153
	Totals				4,153	2,214		6,377
	D. S. S. & A. Ry. 1/2 Interest				2,076	1,107		3,183

RETIREMENTS

Date	ITEMS	Allocn	Master's Unit Price	MASTER'S VALUE Pass.	Frt	Com.	Total
1914	Sault Union Depot Co. Plank Walks and Platforms	Pass.				675	675
						675	675
	D. S. S. & A. Ry. ½ Interest					337	337

Schedule No. 37—Contingencies.
No Additions or Retirements

Schedule No. 38—Legal Expenses During Construction.
No Additions or Retirements

Schedule No. 39—Organization and General Expense
No Additions or Retirements.

Schedule No. 40—Interest During Construction and Taxes
No Additions or Retirements

Schedule No. 41—Furniture and Fixtures
No Additions. No Retirements.

Schedule No. 42—Stores and Supplies
See Summary Sheet

Schedule No. 43—Working Capital
See Summary Sheet

Appreciation—June 30th, 1917
See Summary
No Additions or Retirements.

Michigan Property Assigned to Wisconsin, June 30th, 1917.
None Assigned.

COMPLAINANT'S EXHIBIT 201

COMPARISON OF UNIT PRICES

ITEMS	Unit	Master's Unit Prices	1917 Unit Prices	REMARKS
A				
Angle Bars	Tons	$ 34.00	$ 56.00	Including Transportation and Handling.
B				
Bolts (Track)	Tons	32.00	86.22	Including Transportation and Handling.
Ballast Gravel	Cu. Yd.	.53½	.80	Increase 50%
Ballast Sand	Cu. Yd.	.30	.45	Increase 50%
Ballast Cinders	Cu. Yd.	.30	.45	Increase 50%
Ballast Stamp Sand	Cu. Yd.	.53½	.80	Increase 50%
C				
Crossing Diamonds	Each	311.60	457.08	Including Ties and Labor Placing.
Cattle Guards	Each	20.00	32.72	Steel Surface Gds., Inc. Wings, etc.
Clearing	Acre	40.00	53.00	Increase 33%
Corduroy	Miles	500.00	650.00	Increase 30%
D				
E				
Earth Grading	Cu. Yd.	.30	.40	Increase 33⅓%
Excavation and Back Fill	Cu. Yd.	.50	.75	Increase 50%
F				
Fencing Barbed Wire	Mile	160.00	241.32	Based on Current Prices of each item.
Fencing Woven Wire	Mile		282.12	Based on Current Prices of each item.
G				
Grubbing	Acre	100.00	133.00	Increased 33%
H				
I				
Iron Bridge Bolts, etc	Lbs.	.035	.05	Increased 75%
J				
K				
L				
M				
Masonry, Stone	Cu. Yd.	8.00	12.00	Increased 50%
Masonry, Concrete	Cu. Yd.	8.00	12.00	Increased 50%
N				
Nut Locks	1,000	5.20	12.75	
O				
P				
Piling	Lin Ft.	.40	.50	Increased 25%
Q				
R				
Rail Braces	Each	.115	.19	Increased 70%
Rail	Tons	30.30	41.25	$38 with Transportation and Handling added.
Rip Rap	Cu. Yd.	2.00	2.65	Increase 33%
Rock, Solid	Cu. Yd.	1.35	1.70	Increase 33%
Rock, Loose	Cu. Yd.	.50	.67	Increase 33%
S				
Spikes (Track)	Cwt.	2.10	3.45	Including Frt. Handling and Transportation
Side Tracks	Miles	4,170.00	6,850.00	Including Grading 4,400 Cu. Yds.
Switches Sp. Frogs	Each	199.20	291.45	Based on Cost of Material in 1917
Switches Rigid Frogs	Each	172.80	251.86	Based on Cost of Material in 1917
Switches Stub	Each	135.35	195.27	Based on Cost of Material in 1917
Station Signs	Each	2.00	2.35	Based on Cost of Material in 1917
Steel (Bridge)	Lbs.	.04	.07	Increased 75%
T				
Track Laying and Surfacing	Miles	600.00	900.00	Increased 50%
Ties Standard Soft Wood	Each	.39	.448	Based on Cost plus 9 cts. overhead
Ties Culls Soft Wood	Each	.19		Based on Cost plus 9 cts. overhead
Ties Bridge Soft Wood	Ft. BM	34.00	44.00	In Place
Timber, Bridges, etc	Ft. BM	43.00	49.00	In Place
U				
V				
W				
Water Stations	Each	2,667.00	3,237.00	Complete Based on Cost
X				
Y				
Z				

COMPLAINANT'S EXHIBIT 202

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Mileage Owned—June 30th, 1914.

	From		To		Mich.	Wis.	Total
Main Line	S. S. Marie	Mich.	Superior	Wis.	301.54	107.15	408.69
Main Line	Soo Junction	"	St. Ignace	Mich.	42.97		42.97
Main Line	Marquette	"	Winthrop Jct	"	17.33		17.33
Main Line	Nestoria	"	Houghton	"	48.24		48.24
Main Line	Humboldt	"	Republic	"	8.70		8.70
Branches	Negaunee	"	Volunteer Mine	"	4.19		4.19
Branches	Bessemer Jct	"	Bessemer	"	2.23		2.23
Branches	Spurs for traffic purposes				66.26	2.94	69.20
			Total		491.46	110.09	601.55
			Percent		81.70	18.30	100.00

Statement of Revenue Locomotive Mileage—Year Ending June 30th, 1914.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Freight Locomotive Miles	851,529	185,644		1,037,173
Passenger Locomotive Miles	802,737	155,427	5,544	963,708
Mixed Locomotive Miles	18,871			18,871
Special Service Locomotive Miles	1,350	314	8	1,681
Total on D. S. S. & A.	1,674,496	341,385	5,552	2,021,433
Per cent	82.84	16.89	.27	100
Pass. Loco. Miles on M. R. R. R.	42,701			42,701
Total on D. S. S. & A. and M. R. R. R.	1,717,197	341,385	5,552	2,064,134

Statement of Freight Locomotive Mileage—Year Ending June 30th, 1914.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Freight Locomotive Miles	851,529	185,644		1,037,173
Mixed Locomotive Miles (82.33%)	15,537			15,537
Special Service Loco. Miles, Mixed (82.33%)	526	89		615
Total	867,592	185,733		1,053,325
Percent				100

COMPLAINANT'S EXHIBIT 202

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Passenger Locomotive Mileage—Year Ending June 30th, 1914.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Passenger Locomotive Miles	802,737	155,427	5,544	963,708
Mixed Locomotive Miles (17.67%)	3,334			3,334
Special Service Loco. Miles:				
Passenger	721	205	8	934
Mixed (17.67%)	112	20		132
Total	806,904	155,652	5,552	968,108
Percent				100

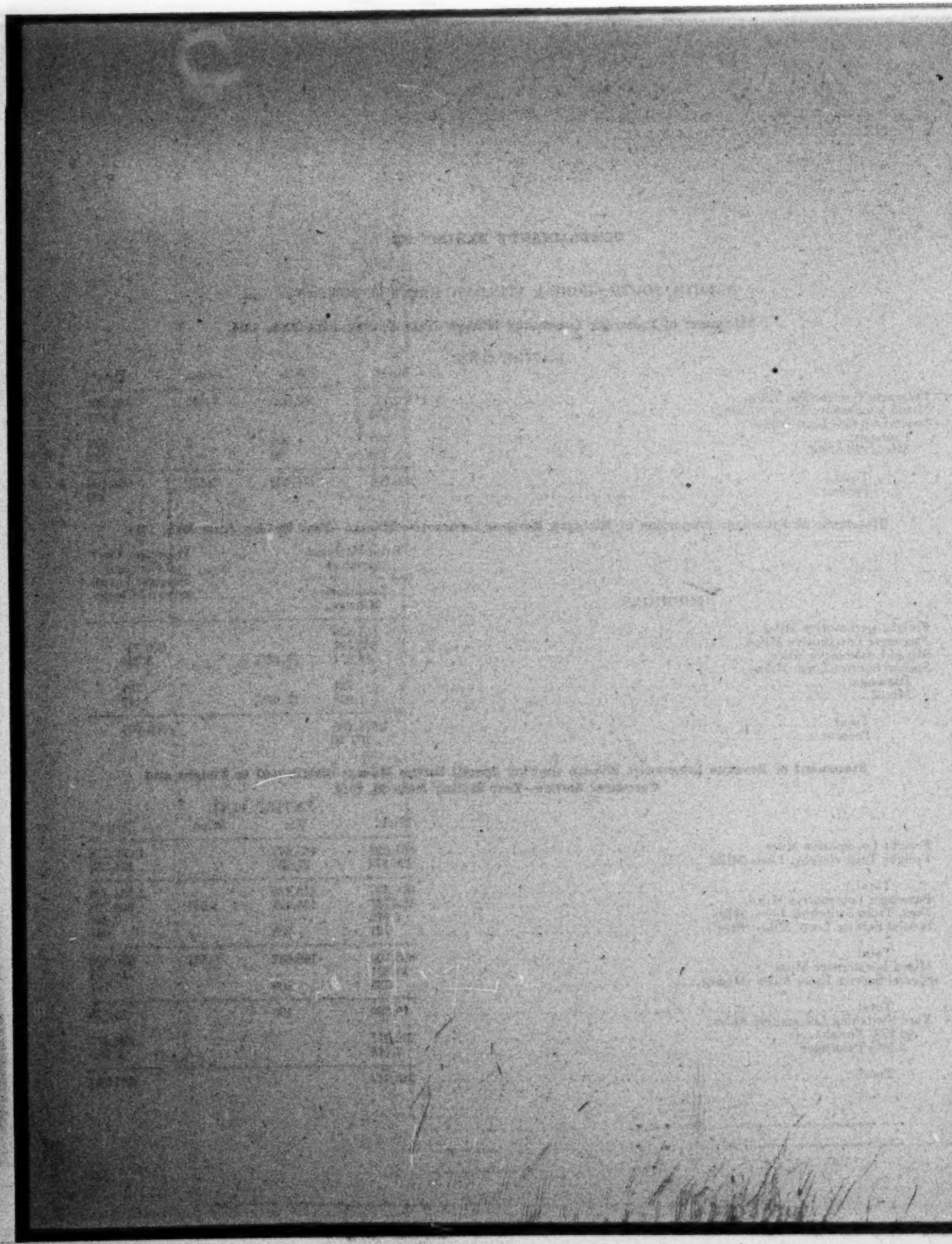
Statement of Passenger Proportion of Michigan Revenue Locomotive Mileage—Year Ending June 30th, 1914.

MICHIGAN	Total Michigan Revenue Locomotive Mileage		Passenger Pro. of Michigan Revenue Locomotive Mileage
Freight Locomotive Miles	851,529		
Passenger Locomotive Miles	802,737		802,737
Mixed Locomotive Miles	18,871	17.67%	3,334
Special Service Loco. Miles:			
Passenger	721		721
Mixed	638	17.67%	112
Total	1,674,496		806,904
Percent	100.00		

Statement of Revenue Locomotive Mileage showing Special Service Mileage distributed to Freight and Passenger Service—Year Ending June 30, 1914.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Freight Locomotive Miles	851,529	185,644		1,037,173
Freight Train Sw'chg. Loco. Miles	126,878	27,475		154,353
Total	978,407	213,119		1,191,526
Passenger Locomotive Miles	802,737	155,427	5,544	963,708
Pass. Train Switching Loco. Miles	2,248			2,248
Special Service Loco. Miles (Pass.)	721	205	8	934
Total	805,706	155,632	5,552	966,890
Mixed Locomotive Miles	18,871			18,871
Special Service Loco. Miles (Mixed)	638	109		747
Total	19,500	109		19,618
Yard Switching Locomotive Miles:				
96.82% Freight	236,177			236,177
3.18% Passenger	7,765			7,765
Total	243,942			243,942



COMPLAINANT'S EXHIBIT 202

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY CO.

Statement of Revenue Train Mileage Year ending June 30th, 1914.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Freight Train Miles	782,236	166,364		948,600
Passenger Train Miles	775,736	155,119	3,506	934,361
Mixed Train Miles	17,616			17,616
Special Service Train Miles	1,227	211	3	1,441
‡Total	1,576,815	321,694	3,509	1,902,018
Percent	82.90	16.91	.19	100.00

Statement of Freight Train Mileage, including Proportion of Mixed and Special Service Train Miles Year ending June 30th, 1914.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Freight Train Miles	782,236	166,364		948,600
Mixed Train Miles (82.33%)	14,503			14,503
Special Service Train Miles:				
Mixed (82.33%)	453	90		543
‡Total	797,192	166,454		963,646
Percent				100

Statement of Passenger Train Mileage, including Proportion of Mixed and Special Service Train Miles, Year ending June 30th, 1914.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Passenger Train Miles	775,736	155,119	3,506	934,361
Mixed Train Miles (17.67%)	3,113			3,113
Special Service Train Miles:				
Passenger	677	102	3	782
Mixed (17.67%)	97	19		116
‡Total	779,623	155,240	3,509	938,372
Percent				100

‡The mileage of C. & N. W. Trains Nos. 110, 111, between Negaunee and Marquette, and of C. M. & St. P. Trains Nos. 105, 106, between Milwaukee Jct., Champion and Marquette is not included in the above.

COMPLAINANT'S EXHIBIT 202

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Statement of Passenger Proportion of Michigan Revenue Train Mileage—Year Ending June 30th, 1914

MICHIGAN

	Total Michigan Revenue Train Mileage		Passenger Pro. of Michigan Revenue Train Mileage
Freight Train Miles	782,236		
Passenger Train Miles	775,736		775,736
Mixed Train Miles	17,616	17.67%	3,113
Special Service Train Miles			
Passenger	677		677
Mixed	550	17.67%	97
Total	1,576,815		779,623
Percent	100		
Mileage of C. M. & St. P. Trains 105,106 over D. S. S. & A. tracks	20,032		20,032
Mileage of C. & N. W. Trains 110,111 over D. S. S. & A. tracks	10,950		10,950
Total	1,607,797		810,605
Percent	100		

Statement of Passenger Car Mileage—Year ending June 30th, 1914

ENTIRE LINE

	Mich.	Wis.	Minn.	Total
Passenger Car Miles				
Passenger Cars	1,812,857	303,790	10,400	2,127,047
Sleeping, Parlor and Observation Cars	242,555	1,080	70	243,705
Other Passenger Train Cars	962,012	154,051	5,744	1,121,807
Special Car Miles				
Passenger	706	109		815
Sleeping, Parlor and Observation Cars	932	416	8	1,356
Other Passenger Train Cars	714	109		823
Total	3,019,776	459,555	16,222	3,495,553
Per cent	86.39	13.15	.46	100.00
Mileage of D. S. S. & A. Sleeping and Dining Cars not included in above				
Sleeping Cars	524,976	159,140	5,840	689,956
Dining Cars	294,361	54,003	2,920	351,284
	3,839,113			4,536,793

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Statement of Freight Car Mileage—Year Ending June 30th, 1914

ENTIRE LINE

	Mich.	Wis.	Minn.	Total
Freight Car Miles				
Loaded	11,169,488	1,978,888		13,148,376
Empty	4,386,875	894,733		5,281,608
Caboose	769,568	161,313		930,881
Special Car Miles				
Freight—Loaded	4,795	1,853		6,648
Caboose	496	109		605
Total	16,331,222	3,036,896		19,368,118
Percent	84.32	15.68		100.00

Statement of Non-Revenue Car Miles—Year Ending June 30th, 1914

ENTIRE LINE

	Mich.	Wis.	Minn.	Total
Non-Revenue Car Miles	535,162	206,782		741,944
Percent	72.13	27.87		100.00

COMPLAINANT'S EXHIBIT 202

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Year Ending June 30th, 1914.

ENTIRE LINE

Operating Revenue	3,412,575.38	
Operating Expenses	2,763,996.68	
Net Operating Revenue		648,578.70
Outside Operations:		
Revenues	83,069.16	
Expenses	78,414.32	
Net Revenue from Outside Operations		4,654.84
Total Net Revenue		653,233.54
Taxes Accrued		247,442.99
Operating Income		405,790.55
Other Income:		
Joint Facilities	10,972.36	
Other Properties—Net Income	4,742.13	
Dividends	5,000.00	
Interest	6,104.46	
Total Other Income		26,818.95
Gross Corporate Income		432,609.50
Deductions from Gross Corporate Income:		
Hire of Equipment	35,059.56	
Joint Facilities	37,367.21	
Miscellaneous Rents	101.00	
Separately Operated Properties	24,149.32	
Miscellaneous Tax Accruals	1,022.84	
Total Deductions (Interest on Funded Debt not included)		97,699.93
		334,909.57

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Revenues—Year Ending June 30th, 1914.

	Entire Line	Michigan	
Freight Revenue	2,091,596.65	1,818,060.76	
Switching Revenue	15,788.35	8,614.94	
Miscellaneous Freight Revenue	3,742.43	3,503.84	
Miscellaneous (Dockage and Handling Iron Ore)	40,647.97	40,647.97	
Special Service Train Revenue	1,726.89	1,361.39	
Storage—Freight	306.45	300.89	
Car Service	5,913.60	5,720.10	
Total Freight Revenue	2,159,722.34	1,878,209.89	64.02%
Passenger Service Train Revenue	1,221,955.44	1,054,014.05	
Special Service Train Revenue	1,317.28	1,075.28	
Station and Train Privileges	600.00	498.12	
Parcel Room Receipts	78.75	78.75	
Storage—Baggage	66.00	66.00	
Total Passenger Revenue	1,224,017.47	1,055,732.20	35.98%
			100.00
Telegraph Service Revenue	598.41	583.43	
Rents of Buildings and Other Property	11,867.89	11,517.64	
Miscellaneous	7,972.55	7,870.94	
Total	20,438.85	19,972.01	
Joint Facility Revenue—Dr	697.41	697.41	
Joint Facility Revenue—Cr	9,094.13	2,941.92	
Total	8,396.72	2,244.51	
Total Operating Revenue	3,412,575.38	2,956,158.61	

COMPLAINANT'S EXHIBIT 202

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Revenue—Year ending June 30th, 1914.

MICHIGAN

	Total	Assigned to Freight	Assigned to Passenger
Freight Revenue	1,818,060.76	1,818,060.76	
Switching Revenue	8,614.94	8,614.94	
Miscellaneous Freight Revenue	3,503.84	3,503.84	
Miscellaneous (Dockage and Handling Iron Ore)	40,647.97	40,647.97	
Special Service Train Revenue	1,361.39	1,361.39	
Storage—Freight	300.89	300.89	
Car Service	5,720.10	5,720.10	
		1,878,209.89 64.02%	
Passenger Train Revenue	1,054,014.05		1,054,014.05
Special Service Train Revenue	1,075.28		1,075.28
Station and Train Privileges	498.12		498.12
Parcel Room Receipts	78.75		78.75
Storage—Baggage	66.00		66.00
Total Freight and Passenger Revenue	2,933,942.09		1,055,732.20 35.98%
Telegraph Service Revenue {Frt.....64.02% Pass.....35.98%}	583.43	373.51	209.92
Rents of Buildings and other Property	11,517.64‡	8,762.35	1,064.11
Miscellaneous	7,870.94	6,687.46	1,183.48
Joint Facility Revenue—Dr	697.41	408.07	289.34
Joint Facility Revenue—Cr	2,941.92	1,871.87	1,070.05
	22,216.52		
Total Operating Revenue	2,956,158.61	1,895,905.08	1,058,970.42

‡$1,691.18 "Rents of Buildings and Other Property" is on property not included in inventory.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Expenses—Year ending June 30th, 1914.

MICHIGAN

No. of Passengers	Passengers One Mile	Average Haul	Rate per Passenger Per Mile
823,893—100%	37,955,679—100%	46.07	.02514
	INTRASTATE		
720,247—87.42%	24,554,687—64.69%	34.09	.02525
	INTERSTATE		
103,646—12.58%	13,400,992—35.31%	129.30	.02493
	ENTIRE LINE		
903,370	45,090,592	49.91	.02449

COMPLAINANT'S EXHIBIT 202

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY CO.

Assignment of Rent of Buildings and Other Property (Mich.)—Year ending June 30th, 1914.

Location	Description	Lessee	Passenger	Freight	Common	Excluded Land
Thomaston	Boarding House	Mrs. A. Steele				100.00
L'Anse	Hotel	V. D. Simar & W. J. Reese				360.00
Baraga	Shoe Shop	Jas. Burns				12.00
Marquette	Mdse. Dock	F. B. Spear & Sons		3,000.00		
Baraga	Site for Tank	Standard Oil Co			60.00	
Houghton	Sec. House	Mrs. Martha Stone			120.00	
Marquette	Warehouse	M. Sweder				120.00
Negaunee	Room in Frt. House	American Express Co		300.00		
Marquette	Site for Fish House	P. Anderson		100.00		
Negaunee	Site for Coal Trestle	J. Pickands & Co		80.00		
L'Anse	Lumber Yard	Marshall Butters Lbr. Co				450.00
Marquette	Site for Fish House	R. Boutel		50.00		
Marquette	Site for Mill	Consolidated Fuel & Lbr. Co		240.00		
Trout Creek	Site for Warehouse	Duluth Brg. & Malting Co			5.00	
Allenville	Site for Dwelling	Wm. Martalla			1.00	
Ewen	Site for Warehouse	Mike Greenough			10.00	
Houghton	Site for Boat House	J. C. Pryor		1.00		
Soo	Site for Dwelling	A. Bokaski				1.00
Ewen	Site for Warehouse	A. F. O'Rourke			5.00	
Bergland	Site for Warehouse	G. A. Bergland			5.00	
Thomaston	Site for Dwellings	Various				23.00
Wetmore	Site for Warehouse	Upper Penn. Potato Co			5.00	
Eckerman	Site for Warehouse	Pen. Bark & Lbr. Co			5.00	
Ishpeming	Site for Dwelling	L. Cain		1.00		
Winthrop Jct	Site for Dwelling	Wm. Garceau			1.00	
Negaunee	Site for Driveway	J. H. Sawbridge			1.00	
L'Anse	Site for Driveway	J. Koolick				12.00
Negaunee	Site for Warehouse	Gannon Grocery Co			15.00	
Isle Royal Jct	Site for Dwelling	J. Glendenning			1.00	
Ozark	Site for Warehouse	Central Paper Co			5.00	
Nestoria	Site for Dwelling	H. Touotillatt			1.00	
Sidnaw	Site for Warehouse	H. L. Kirkland			5.00	
Ewen	Site for Warehouse	W. F. Leach				10.00
Ewen	Site for Warehouse	Humphrey Merc. Co			10.00	
Brimley	Site for Warehouse	Wm. Reynard			10.00	
Soo	Site for Dwelling	H. Bigger, etc				60.00
Eckerman	Site for Dwelling	F. X. Brissette			1.00	
Sidnaw	Site for Dwelling	J. Swanson			1.00	
Ishpeming	Site for Dwelling	P. Gigger		1.00		
Ishpeming	Site for Dwelling	Jas. McGee		1.00		
Chassell	Site for Yard	C. H. Worcester			1.00	
Ewen	Site for Warehouse	J. N. Suet			10.00	
Baraga	Site for Ice House	P. Foucault				12.00
Republic	Site for Barn, etc	P. Foucault		4.00		
Marquette	Site for Garden	Wm. Dorais, J. Lemire				26.00
St. Ignace	Site for Porch	C. H. Stanus			5.00	
Houghton	Site for Boat House, etc			20.00		
L'Anse	Site for Dwelling	P. Dorgan				12.00
Seney	Site for Warehouse				24.00	
L'Anse	Site for Warehouse	Richter Brg. Co				10.00
Baraga	Site for Warehouse	Bosch Brg. Co				12.00
Peshims Spur	Site for Warehouse	Pen. Bark & Lbr. Co			5.00	
Soo	Site for Mill	Kelly & Meyer				25.00
Soo	Site for Shop	Northwestern Leather Co		12.00		
				3,810.00	312.00	1,245.00

COMPLAINANT'S EXHIBIT 202

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY CO.

Assignment of Rent of Buildings and Other Property (Mich.)—Cont.

Year Ending June 30th, 1914.

Location	Description	Lessee	Passenger	Freight	Common	Excluded Land
				3,810.00	312.00	1,245.00
L'Anse	Site for Garden	Bolinger & Peterson				10.00
Marquette	Site for Oil House	Marquette Gas Light Co.		10.00		
L'Anse	Site for Pole Yard, etc.	National Pole Co.				50.00
Baraga	Site for Warehouse	U. P. Brewing Co				12.00
Newberry	Site for Warehouse				12.00	
Laketon	Site for Warehouse	F. H. Richard			5.00	
Newberry	Site for Warehouse	Gettleman Brg. Co.			12.00	
Kenton	Site for Watehouse	Liesen & Henes Brg. Co			12.00	
Trout Lake	Site for Dwelling	S. Matheson			1.00	
Brimley	Site for Sidewalk	Superior Township			1.00	
Covington	Site for Warehouse	W. H. Oakley			12.00	
Matchwood	Site for Highway	Matchwood Township			1.00	
Marquette	Site for Warehouse	Armour & Co		180.00		
Marquette	Site for Dock	Jas. Pickands & Co		2,500.00		
Ishpeming	Site for Coal Trestles	Jas. Pickands & Co		30.00		
St. Ignace	Site for Oil Tank	Standard Oil Co		60.00		
Ishpeming	Site for Warehouse	Pabst Brg. Co		25.00		
Onota	Site for Store				1.00	
Negaunee	Site for Refrigerator	J. Perenchio		10.00		
Newberry	Site for Warehouse	J. C. Foster			12.00	
Newberry	Site for Warehouse	W. Everest			25.00	
Champion	Site for Coal Shed	L. J. Cardinal		5.00		
Marquette	Site for Carp Furnace	Pioneer Iron Co			1.00	
Eckerman	Site for Warehouse	Bartlett Lbr. Co			5.00	
Baraga	Site for Ice House	Martin Ice Co				12.00
Soo	Site for Warehouse	J. L. Lipsett		25.00		
Watton	Site for Store	R. C. Kotila			5.00	
Brimley	Site for Warehouse	Brimley Produce Co			10.00	
Strongs	Site for Barn	E. Turner			5.00	
Kenneth	Site for Dwelling	J. Skipper			1.00	
Marquette	Site for Garden	H. P. Stafford				1.00
St. Ignace	Site for Wood Yard	Jas. Wenzel		10.00		
Marquette	Site for Yard	J. D. Mangum		1.00		
Marquette	Site for Pasture	J. Schwemin				1.00
Ewen	Site for Oil Tank	Standard Oil Co			30.00	
Moran	Site for Warehouse	Superior Post Co			10.00	
Marquette	Site for Fish House	John Parker		100.00		
Trout Lake	Site for Dwelling	John Anguilan			5.00	
Trout Creek	Site for Warehouse	Trout Creek Mfg. Co			5.00	
Kenton	Site for Dwelling	E. L. Crull			1.00	
Michigan	Section Houses				1,512.00	
Michigan	Thomaston Cottages					350.18
Michigan	Rooms in Stations				181.00	
Thomaston	Lunch Counter	Mrs. A. Parle	10.00			
Nestoria	Lunch Counter	Mrs. A. Foster	12.00			
Trout Lake	Lunch Counter	O. W. Smith	14.46			
Champion	Lunch Counter	Mrs. May Plattenberg	48.00			
Negaunee	Room in Depot	Western Express Co	60.00			
St. Ignace	Coal Dock	Mack. Trans. Co		360.00		
Soo	Stall in Round House	Mich. Nor. Power Co			379.00	
			144.46	7,126.00	2,556.00	1,691.18

Assignment	Frt.	Pass.
	7,126.00	144.46
$2,556 Com. assigned Frt. 64.02%, Pass. 35.98% (Revenue Basis)	1,636.35	919.65
	$8,762.35	$1,064.11

COMPLAINANT'S EXHIBIT 202

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Joint Facility Revenue—Cr.—Year ending June 30th, 1914

MICHIGAN

	Total	Freight	Passenger
From Sault Ste. Marie Bridge Switching Account. DSS&A Pro. of revenue earned by the Switching Account, transferring freight across the International Bridge	1,522.99	1,522.99	
DSS&A Pro. of Sault Ste. Marie Bridge Co.'s revenue from local fares over the Bridge	73.06		73.06
DSS&A Pro. of Bridge Co.'s revenue from freight switched at Chandler's Siding	132.37	132.37	
DSS&A Pro. of amount collected by the Bridge Co. from the Michigan State Telephone Co. for the privilege of stringing wires over the Bridge	14.24	9.86	①4.38
DSS&A Pro. of rentals received by the Sainte Marie Union Depot Co. for:			
Lunch Counter and Express Office in Passenger Station	271.12		271.12
Warehouse Sites (Freight)	206.65	206.65	
Use of Passenger Facilities by C. P. Ry	721.49		721.49
	2,941.92	1,871.87	1,070.05

①Divided between Freight and Passenger on relation of DSS&A freight revenue and passenger revenue to DSS&A total revenue on traffic passing over the Bridge.

Joint Facility Revenue—Dr.—Year Ending June 30th, 1914.

MICHIGAN

	Paid to	Total	Freight	Passenger
Pro. of Rental Lunch Counter at Trout Lake	M.St.P.& S.S.M.	9.22	5.90	3.32
Pro. of Rental of Stall in Soo Round House	M.St.P.& S.S.M.	223.87	143.32	80.55
Pro. of Rental of Wye track at Soo, Mich.	M.St.P.& S.S.M.	404.32	258.85	145.47
Pro. of Rental of Office in Pass. Sta. at Negaunee	C. & N. W.	60.00		60.00
		697.41	408.07	289.34

The first three items divided between freight and passenger on revenue basis. Frt. 64.02% Pass. 35.98%

Assignment to Intrastate and Interstate

		Intrastate	Interstate
$ 73.06	All Interstate		73.06
4.38	All Interstate		4.38
992.61	64.98% Intra. Rev. Basis	645.00	
1,070.05	35.02% Inter. Rev. Basis		347.61
Joint Facility Rev.—Cr.		645.00	425.05
Joint Facility Rev.—Dr. Total Pass. $289.34	Intra. 64.98%	188.02	
	Inter. 35.02%		101.32
Balance Pass. 780.71		456.98	323.73

COMPLAINANT'S EXHIBIT 202

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Hire of Equipment—Year Ended June 30, 1914.

	System Total	%	Mich. Total	%	Mich. Frt.	%	Mich. Passenger
Equipment Leased to Others:							
Locomotives leased to Soo Bridge Swch.A/C	7,320.00	84.54	6,188.33	83.93	5,193.87	16.07	994.46
Locomotives leased to Various Companies	2,198.48		1,796.16		1,796.16		
Cars to L.S.Term. & Tfr. Co.	1.00		.82		.82		
Cars to Fiborn Quarry	3.00		2.45		2.45		
	9,522.48		7,987.76		6,993.30		994.46
Equipment Interchanged: Borrowed							
Passenger Locomotives	28.00	81.70	22.88				22.88
Freight Locomotives	41.95	81.70	34.27		34.27		
Switch Locomotives	129.48	81.70	105.79		105.79		
Passenger Cars	2,212.21	81.70	1,807.38				1,807.38
Passenger Sleepers	1,710.88	81.70	1,397.79				1,397.79
Freight Train Cars	201,014.97	81.70	164,229.22		164,229.22		
Work Equipment	42.50	81.70	34.72		17.52		17.20
	205,179.99		167,632.05		164,386.80		3,245.25
Equipment Interchanged: Loaned							
Passenger Locomotives	475.74	81.70	388.68				388.68
Freight Locomotives	205.73	81.70	168.08		168.08		
Switch Locomotives	79.00	81.70	64.54		64.54		
Passenger Train Cars	632.28	81.70	516.57				516.57
Freight Train Cars	159,024.20	81.70	129,922.77		129,922.77		
Work Equipment	181.00	81.70	147.88		74.64		73.24
	160,597.95		131,208.52		130,230.03		978.49
Hire of Equipment Balance—Dr	35,059.56		28,435.77		27,163.47		1,272.30
					Inter	35.02%—	445.56
					Intra	64.98 —	826.74

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Rents Received (Joint Facilities)—Year ending June 30th, 1914.

MICHIGAN.

Main Line—Ishpeming to Marquette, used by C. & N. W. Ry. passenger trains	$ 1,047.11	Passenger
Main Line—Negaunee to Calumet, used by C. & N. W. Ry. passenger trains	6,528.97	Passenger
Main Line—Houghton to Pilgrim, used by Mineral Range R. R. freight trains	1,215.32	Common
Mine Yard Tracks—Ishpeming, used by switch engines of L. S. & I. Ry	1,334.40	Freight
Coal Dock Tracks—Marquette, used by J. Pickands Co	11.25	Freight
Land—Negaunee, occupied by Union Depot (Passenger)	150.00	Passenger
Union Depot Tracks—Negaunee, used by C. & N. W. Ry. Co	57.01	Common
Enginehouse—Houghton, used by Mineral Range R. R. Co	47.20	Freight
Yard Tracks—Sault Ste. Marie, used by Can. Pac. Ry. Co	581.10	Common
	$ 10,972.36	

SUMMARY.

Common	Freight	Passenger
	$ 1,392.85	$ 7,726.08
(Rev. basis) 64.02% of $1,853.43	1,186.57	
(Rev. basis) 35.98% of 1,853.43		666.86
	$ 2,579.42	$ 8,392.94
$8,392.94 Passenger assigned Intrastate, 64.98%—Rev. Basis		$ 5,453.73
Interstate, 35.02%—Rev. Basis		2,939.21

Apportionment of Miscellaneous Rents Paid—Year ending June 30th, 1914.

MICHIGAN.

Rent of land for freight sidings:	Total	Freight	Passenger
at Houghton, Mich	98.00	98.00	
at Negaunee, Mich	2.00	2.00	
at Ishpeming, Mich	1.00	1.00	
	101.00	101.00	

COMPLAINANT'S EXHIBIT 202

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Rents Paid (Joint Facilities)—Year ending June 30th, 1914.

MICHIGAN.

	Total	Freight	Passenger
Sault Ste. Marie Bridge Co. (International Bridge) Bond Interest, Sinking Fund and Taxes are paid by the D. S. S. & A. Ry. Co., C. P. Ry. Co. and "Soo" Line on basis of Revenue (Freight and Pass.) earned by each on traffic that passes over the Bridge—D. S. S. & A. Pro	2,485.19	1,700.74	784.45①
Sault Bridge Switching Account—Yard at Sault Ste. Marie, Mich	2,943.44	2,943.44	
Sainte Marie Union Depot Co. at Sault Ste. Marie, Mich.—Proportion of Hire of Equipment and Taxes	1,609.91	425.78	1,184.13②
Mineral Range R. R. Co.—Yard Tracks at Houghton	1,330.04	1,330.04	
C. & N. W. Ry. Co.—Yard Tracks at Negaunee	470.73	470.73	
L. S. & I. Ry. Co.—Yard Tracks at Negaunee	434.52	434.52	
Mineral Range R. R. Co.—Roundhouse at Calumet (Pass. engines only)	298.80		298.80
Minn., St. Paul & S. S. Marie Ry. Co.—Proportion of amount collected from Can. Pac. Ry. Co. for use of yard tracks at Sault Ste. Marie, Mich., for turning passenger trains	309.61	198.21	111.40③
	9,882.24	7,503.46	2,378.78

Basis of division between Freight and Passenger:

①On relation of D. S. S. & A. freight revenue and passenger revenue to D. S. S. & A. total revenue on traffic passing over the bridge. All interstate.

②Rental of equipment allocated according to service—taxes on relation of cost of passenger and freight portion of the property to total cost.

③On revenue basis Frt. 64.02%, Pass. 35.98%.

	Intrastate		Interstate	
Division of "Passenger" between:				
Item ① All Interstate				784.45
Remainder, $1,594.33	64.98%	$1,036.00	35.02%	558.33
		$1,036.00		$1,342.78

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

IN MICHIGAN.

Estimated Loss by Application of Act 276.

YEAR 1914	Intrastate	Interstate	Total
Amount that could be obtained under a Two Cent Rate, except on fares of five miles or less and certain fares via Negaunee and Champion included herein, on which more than two cents could be obtained, as shown below:			
Adults, 2c. per mile	$481,468	$261,373	$742,841
Children, 1c. per mile	4,813	3,323	8,136
	$486,281	$264,696	$750,977
Add:			
Amount in excess of 2c. per mile that could be obtained from fares of five miles or less.	2,231		2,231
Amount in excess of 2c. per mile that could be obtained on certain business via Negaunee and Champion	123	4,660	4,783
Total	$488,635	$269,356	$757,991
Amount that was received under Three Cent Rate	619,934	334,103	954,037
Loss, 1914	$131,299	$ 64,747	$196,046

COMPLAINANT'S EXHIBIT 202

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Special Service Train Revenue—Year Ended June 30th, 1914.

Month	Item	Entire Line		Mich.		Mich., Intrastate	
		Frt.	Pass.	Frt.	Pass.	Frt.	Pass.
1913							
July	Sun Brothers' Circus, Hoton to Supr.	6 Cars 416.67	3 Cars 208.33	416.67	208.33	416.67	208.33
July	Great Patterson Shows	17 Cars 850.00	4 Cars 200.00	484.50	114.00	484.50	114.50
July	Gt. Southern Shows	7 Cars 229.45	2 Cars 65.55	229.45	65.55	229.45	65.55
July	Western Land Sec. Co		27.00		27.00		27.00
Sept.	A. B. Miller's Shows	20 Cars 230.77	6 Cars 69.23	230.77	69.23	230.77	69.23
Sept.	H. R. Harris and Party		239.67		249.67		249.67
Sept.	W. G. Mather and Party, Dul. to Saxon		147.00		147.00		147.00
Nov.	Pickands, M. & Co		156.00				
1914							
Feb.	S. Mitchell		25.00		25.00		
March	W. G. Mather		169.50		169.50		169.50
		1,726.89	1,317.28	1,361.39	1,075.28	1,361.39	1,050.2

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Freight Statistics—Year Ending June 30th, 1914.

MICHIGAN.

	Net Tons	Tons One Mile	Revenue
Freight other than Interstate Iron Ore	2,278,055	206,555,837	1,613,657.42
Iron Ore to Marquette Dock—all Interstate	860,153	14,884,989	204,403.34
Total Michigan Freight	3,138,208	221,440,826	1,818,060.76

Michigan Intrastate Freight	Net tons	Tons One Mile	Revenue
	1,022,603	66,419,479	640,308.58
Percent of Freight other than Iron Ore	44.89	32.16	40.24
Percent of Total Michigan Freight	32.59	29.99	35.72

Michigan Interstate Freight	Net Tons	Tons One Mile	Revenue
Freight other than Iron Ore	1,255,452	140,136,358	964,258.84
Percent of freight other than Iron Ore	55.11	67.84	59.76
Iron Ore to Marquette Docks	860,153	14,884,989	204,403.34
	2,115,605	155,021,347	1,168,662.18
Percent of total Michigan Freight	67.41	70.01	64.28

Freight other than Iron Ore—Michigan:
- Rate per ton per mile .00781
- Average rate per ton .70833
- Average distance hauled 90.67 mi.

Total Freight—Michigan:
- Rate per ton per mile .00821
- Average rate per ton .57933
- Average distance hauled 70.56 mi.

Iron Ore to Docks—Michigan:
- Rate per ton per mile .01373
- Average rate per ton .23763
- Average distance hauled 17.31 mi.

All Michigan Intrastate Freight:
- Rate per ton per mile .00978
- Average rate per ton .63504
- Average distance hauled 64.95 mi.

Michigan Interstate Freight other than Iron Ore.
- Rate per ton per mile .00688
- Average rate per ton .76805
- Average distance hauled 111.62 mi.

All Michigan Interstate Freight:
- Rate per ton per mile .00753
- Average rate per ton .55240
- Average distance hauled 73.28 mi.

ENTIRE LINE.

Number of net tons carried	Freight	2,448,319
Number of net tons carried	Iron Ore to Docks	860,153
Number of net tons carried	All Freight	3,308,472
Number of net tons carried one mile	Freight	246,221,720
Number of net tons carried one mile	Iron Ore to Docks	14,884,989
Number of net tons carried one mile	All freight	261,106,709
Average net ton haul		78.92 mi.
Rate per ton per mile		.00801

COMPLAINANT'S EXHIBIT 203

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Mileage Owned, June 30th, 1915.

	FROM		TO		Mich.	Wis.	Total
Main Line	S. S. Marie	Mich.	Superior	Wis.	301.54	107.15	408.69
Main Line	Soo Junction	"	St. Ignace	Mich.	42.97		42.97
Main Line	Marquette	"	Winthrop Jct	"	17.33		17.33
Main Line	Nestoria	"	Houghton	"	48.24		48.24
Main Line	Humboldt	"	Republic	"	8.70		8.70
Main Line	Negaunee	"	Volunteer Mine	"	4.19		4.19
Branches	Bessemer Jct	"	Bessemer		2.23		2.23
Branches	Spurs for traffic purposes				66.79	1.50	68.29
Branches							
					491.99	108.65	600.64
Total					81.91	18.09	100
Per Cent							

Statement of Revenue Locomotive Mileage. Year Ending June 30th, 1915.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Freight Locomotive Miles	697,148	139,781		836,929
Passenger Locomotive Miles	770,829	155,187	6,601	932,617
Mixed Locomotive Miles	16,497			16,497
Special Service Locomotive Miles	1,300	204	7	1,511
Train Switching Locomotive Miles	99,040	20,[illegible]43		119,483
Yard Switching Locomotive Miles	215,676			215,676
Total on D. S. S. & A.	1,800,490	315,615	6,608	2,122,713
Per Cent	84.82			100
Passenger Miles on M. R. R. R.	42,577			42,577
Total on D. S. S. & A. and M. R. R. R.	1,843,067	315,615	6,608	2,165,290
Per Cent	85.12			100

Statement of Freight Locomotive Mileage, Year Ending June 30th, 1915.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Freight Locomotive Miles	697,148	139,781		836,929
Mixed Locomotive Miles (79.3%)	13,082			13,082
Special Service Locomotive Miles Mixed (79.3%)	656	86		742
Train Switching Locomotive Miles	96,820	20,443		117,263
Total	807,706	160,310		968,016
Per Cent	83.44			100

COMPLAINANT'S EXHIBIT 203

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Passenger Locomotive Mileage, Year Ending June 30th, 1915.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Passenger Locomotive Miles	770,829	155,187	6,601	932,617
Mixed Locomotive, Miles (20.7%)	3,415			3,415
Special Service Locomotive Miles:				
Passenger	473	95	7	575
Mixed (20.7%)	171	23		194
Train Switching Locomotive Miles	2,220			2,220
Total on D. S. S. & A.	771,108	155,305	6,608	939,021
Per Cent	82.76	16.54	.70	100
Passenger Miles on M. R. R. R.	42,577			42,577
Total on D. S. S. & A. and M. R. R. R.	819,685	155,305	6,608	981,598
Per Cent	83.51			100

Statement of Passenger Proportion of Michigan Revenue Locomotive Mileage, Year Ending June 30th, 1915.

MICHIGAN.

	Total Michigan Revenue Locomotive Mileage		Passenger Proportion of Michigan Revenue Locomotive Mileage
Freight Locomotive Miles	697,148		
Passenger Locomotive Miles	770,829		770,829
Mixed Locomotive Miles	16,497	20.7%	3,415
Special Service Locomotive Miles:			
Passenger	473		473
Mixed	827	20.7%	171
Train Switching Locomotive Miles:			
Freight	96,820		
Passenger	2,220		2,220
Total on D. S. S. & A.	1,584,814		777,108
Per Cent	100		
Passenger Locomotive Miles on M. R. R. R.	42,577		42,577
Total on D. S. S. & A. and M. R. R. R.	1,627,391		819,685
Per Cent	100		50.37

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Revenue Locomotive Mileage Showing Special Service Mileage Distributed to Freight and Passenger Service, Year Ending June 30th, 1915.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Freight Locomotive, Miles	697,148	139,781		836,929
Freight Train Switching Locomotive, Miles	96,820	20,443		117,263
Total	793,968	160,224		954,192
Per Cent	83.21			100
Passenger Locomotive Miles	770,829	155,187	6,601	932,617
Passenger Train Switching Locomotive Miles	2,220			2,220
Special Service Locomotive Miles	473	95	7	575
Total	773,522	155,282	6,608	935,412
Per Cent	82.69			100
Mixed Locomotive Miles	16,497			16,497
Special Service Locomotive Miles	827	109		926
Total	17,324	109		17,433
Per Cent	99.37			100
Yard Switching Locomotive Miles:				
Freight, 96.62%	208,388			208,388
Passenger, 3.38%	7,288			7,288
Total	215,676			215,676
Per Cent	100			100

COMPLAINANT'S EXHIBIT 203

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Revenue Train Mileage.

Year Ending June 30th, 1915.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Freight Train Miles	659,025	137,050		796,075
Passenger Train Miles	750,193	154,030	4,425	908,408
Mixed Train Miles	16,497			16,497
Special Service Train Miles	1,091	166	3	1,260
†Total	1,426,806	291,246	4,248	1,722,300
Per Cent	82.84	16.91	.25	100

Statement of Freight Train Mileage, including Proportion of Mixed and Special Service Train Miles.

Year Ending June 30th, 1915.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Freight Train Miles	659,025	137,050		796,075
Mixed Train Miles (79.3%)	13,082			13,082
Special Service Train Miles: Mixed (79.3%)	534	87		621
†Total	672,641	137,137		809,778
Per Cent	83.06	16.94		100

Statement of Passenger Train Mileage, including Proportion of Mixed and Special Service Train Miles.

Year Ending June 30th, 1915.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Passenger Train Miles	750,193	154,030	4,245	908,468
Mixed Train Miles (20.7%)	3,415			3,415
Special Service Train Miles:				
Passenger	417	57	3	477
Mixed (20.7%)	140	22		162
†Total	754,165	154,109	4,248	912,522
Per Cent	82.65	16.89	.46	100

†The mileage of C. & N. W. trains Nos. 110,111 between Negaunee and Marquette and C. M. & St. P. trains Nos. 105, 106 between Milwaukee Jct. and Marquette is not included in the above.

COMPLAINANT'S EXHIBIT 203

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Revenue Train Mileage.

Year Ending June 30th, 1915.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Freight Train Miles	659,025	137,050		796,075
Passenger Train Miles	750,193	154,030	4,425	908,468
Mixed Train Miles	16,497			16,497
Special Service Train Miles	1,091	166	3	1,260
†Total	1,426,806	291,246	4,248	1,722,300
Per Cent	82.84	16.91	.25	100

Statement of Freight Train Mileage, including Proportion of Mixed and Special Service Train Miles.

Year Ending June 30th, 1915.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Freight Train Miles	659,025	137,050		796,075
Mixed Train Miles (79.3%)	13,082			13,082
Special Service Train Miles:				
Mixed (79.3%)	534	87		621
†Total	672,641	137,137		809,778
Per Cent	83.06	16.94		100

Statement of Passenger Train Mileage, including Proportion of Mixed and Special Service Train Miles.

Year Ending June 30th, 1915.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Passenger Train Miles	750,193	154,030	4,245	908,468
Mixed Train Miles (20.7%)	3,415			3,415
Special Service Train Miles:				
Passenger	417	57	3	477
Mixed (20.7%)	140	22		162
†Total	754,165	154,109	4,248	912,522
Per Cent	82.65	16.89	.46	100

†The mileage of C. & N. W. trains Nos. 110,111 between Negaunee and Marquette and C. M. & St. P. trains Nos. 105, 106 between Milwaukee Jct. and Marquette is not included in the above.

COMPLAINANT'S EXHIBIT 203

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Passenger Proportion of Michigan Revenue Train Mileage.

Year Ending June 30th, 1915.

MICHIGAN.

	Total Michigan Revenue Train Mileage		Passenger Proportion of Michigan Revenue Train Mileage
Freight Train Miles	659,025		
Passenger Train Miles	750,193		750,193
Mixed Train Miles	16,497	(20.7%)	3,415
Special Service Train Miles:			
Passenger	417		417
Mixed	674	20.7%	140
Total	1,426,806		754,165
Per Cent	100		52.86
Mileage of C. M. & St. P. trains 105, 106 between Milwaukee Jct., Champion and Marquette.	21,498		21,498
Mileage of C. & N. W. trains 110, 111 between Negaunee and Marquette	10,950		10,950
Total	1,459,254		786,613
Per Cent	100		53.90

Statement of Passenger Car Mileage.

Year Ending June 30th, 1915.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Passenger Train Car Miles:				
Passenger Cars	1,635,826	305,833	11,720	1,953,379
Sleeping, Parlor and Observation Cars—Foreign	210,903	779	28	211,710
S. P. & O. Cars, D. S. S. & A. Sleeping Cars	527,327	160,940	5,840	694,107
S. P. & O. Cars, D. S. S. & A. Observation Cars	179,976			179,976
Dining Cars, D. S. S. & A.	116,325	51,608	2,928	170,861
Dining Cars, Foreign	87,145			87,145
Other Passenger Train Cars	855,454	155,974	5,804	1,017,232
Mixed Train Car Miles:				
Passenger Cars	40,138			40,138
Dining Cars	47			47
Other Passenger Train Cars	7,896			7,896
Special Train Car Miles:				
Passenger Cars	3,433	585		4,018
Sleeping, Parlor and Observation Cars	239			239
Other Passenger Train Cars	406	94		506
Total	3,665,115	675,813	26,326	4,367,254
Per Cent	83.92	15.48	.60	100

Statement of D. S. S. & A. Sleeping and Dining Car Mileage, including Mileage Made on Mineral Range R. R.

Year Ending June 30th, 1915.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Sleeping Cars	548,159	160,940	5,840	714,939
Per Cent	76.67	22.51	.82	100
Dining Cars	116,325	51,608	2,928	170,861
Combination Observation and Dining Cars	190,196			190,196
Total	306,521	51,608	2,928	361,057
Per Cent	84.90	14.29	.81	100

COMPLAINANT'S EXHIBIT 203

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY CO.

Statement of Freight Car Mileage, Year Ending June 30th, 1915.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total.
Freight Train Car Miles:				
Loaded	9,952,446	1,605,001		11,557,447
Empty	4,176,261	766,082		4,942,343
Caboose	642,678	136,656		779,334
Mixed Train Car Miles:				
Freight—Loaded	125,272			125,272
Freight—Empty	58,619			58,619
Special Train Car Miles:				
Freight—Loaded	6,753	981		7,734
Freight—Caboose	759	109		868
Total	14,962,788	2,508,829		17,471,617
Percent	85.64	14.36		100.00

Statement of Non-Revenue Car Miles, Year Ending June 30th, 1915.

ENTIRE LINE.

	Mich.	Wis.	Minn.	Total
Non-Revenue Car Miles	216,359	62,922		279,281
Percent	77.47	22.53		100.00

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY CO.

Year Ending June 30th, 1915.

ENTIRE LINE.

Operating Revenue	2,938,597.06	
Operating Expenses	2,401,834.68	
Net Operating Revenue		536,762.38
Railway Tax Accruals	197,313.28	
Uncollectible Railway Revenues	106.89	197,420.17
		339,342.21
Other Income:		
Rent from Locomotives	8,172.71	
Rent from Passenger Train Cars	368.18	
Rent from Work Equipment	994.00	
Joint Facility Rent Income	20,914.76	
Miscellaneous Rent Income	229.77	
Miscellaneous Non-Operating Physical Property	6,116.09	
Income from Un-funded Securities and Accounts	2,587.61	
Income from Sinking and Other Reserve Funds	1,383.99	40,767.11
Gross Income		380,109.32
Deductions from Gross Income:		
Hire of Freight Cars (Balance)	1,534.58	
Rent for Locomotives	448.64	
Rent for Passenger Train Cars	2,229.82	
Rent for Work Equipment	54.50	
Joint Facility Rents	36,688.21	
Miscellaneous Rents	42.00	
Miscellaneous Tax Accruals	1,001.91	
Separately Operated Properties	16,048.42	
Total Deductions (Interest on Funded Debt not included)		58,048.08
		322,061.24

COMPLAINANT'S EXHIBIT 203

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY CO.

Operating Revenues—Year Ending June 30th, 1915.

	Entire Line	Michigan	
Freight Revenue	1,813,059.09	1,603,110.01	
Switching Revenue	19,620.93	10,134.21	
Special Service Train Revenue	1,809.69	1,624.65	
Other Freight Train Revenue	6.90	6.90	
Storage—Freight	1,743.60	1,682.35	
Demurrage	3,385.60	3,017.30	
Miscellaneous (Dockage and handling Iron Ore)	32,755.85	32,755.85	
Total Freight Revenue	1,872,381.66	1,652,331.27	— 64.75%
Passenger Service Train Revenue	965,039.75	837,442.79	
Sleeping Car Revenue	36,032.96	27,734.06	
Parlor & Chair Car Revenue	4,022.30	4,022.30	
Dining and Buffet Car Revenue	35,838.55	28,283.90	
Special Service Train Revenue	1,141.81	1,033.32	
Station, Train and Boat Privileges	600.00	495.47	
Parcel Room Revenue	449.00	449.00	
Storage—Baggage	86.90	86.90	
Total Passenger Revenue	1,043,211.27	899,547.74	— 35.25%
			100.00%
Telegraph Service Revenue	636.85	620.56	
Rents of Buildings and Other Property	8,916.07	8,716.57	
Miscellaneous	6,942.63	6,732.50	
Total	16,495.55	16,069.63	
Joint Facility Revenue—Dr.	12.50	12.50	
Joint Facility Revenue—Cr.	6,521.08	2,318.00	
Total	6,508.58	2,305.50	
Total Operating Revenue	2,938,597.06	2,570,254.14	

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY CO.

Operating Revenue—Year Ending June 30th, 1915.

MICHIGAN	Total	Assigned to Freight	Assigned to Passenger
Freight Revenue	1,603,110.01	1,603,110.01	
Switching Revenue	10,134.21	10,134.21	
Special Service Train Revenue	1,624.65	1,624.65	
Other Freight Train Revenue	6.90	6.90	
Storage—Freight	1,682.35	1,682.35	
Demurrage	3,017.30	3,017.30	
Miscellaneous (Dockage and Handling Iron Ore)	32,755.85	32,755.85	
		1,652,331.27	
		64.75%	
Passenger Train Revenue	837,442.79		837,442.79
Sleeping Car Revenue	27,734.06		27,734.06
Parlor and Chair Car Revenue	4,022.30		4,022.30
Dining and Buffet Car Revenue	28,283.90		28,283.90
Special Service Train Revenue	1,033.32		1,033.32
Station, Train and Boat Privileges	495.47		495.47
Parcel Room Revenue	449.00		449.00
Storage—Baggage	86.90		86.90
	2,551,879.01		899,547.74
			35.25%
Telegraph Service Revenue Frt. 64.75% Pass. 35.25%	620.56	401.81	218.75
Rents of Buildings and Other Property	* 8,716.57	6,810.86	746.64
Miscellaneous	6,732.50	5,382.86	1,349.64
Joint Facility Revenue (Balance)	2,305.50	1,167.58	1,137.92
	18,375.13		
Total Operating Revenue	$2,570,254.14	$1,666,094.38	$903,000.69

*$1,159.07 of "Rents of Buildings and Other Property" is from property not included in the inventory.

COMPLAINANT'S EXHIBIT 208

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Year ending June 30th, 1915.

MICHIGAN.

No. of Passengers.	Passengers One Mile.	Average Haul.	Rate per Passenger per Mile.
690,702 100%	28,938,289 100%	41.90	.02581
	INTRASTATE.		
616,086 89.20%	20,341,201 70.29%	33.02	.02606
	INTERSTATE.		
74,616 10.80%	8,597,088 29.71%	115.22	.02522
	ENTIRE LINE.		
754,924	33,951,411	44.97	.02526

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY CO.

Assignment of Rent of Buildings and Other Property (Mich.), Year ending June 30th, 1915.

Location	Description	Lessee	Passenger	Freight	Common	Excluded Land	Total
Thomaston	Hotel	Mrs. A. Steele				40.00	
Baraga	Site for Oil Tank	Standard Oil Co			90.00		
Houghton	Section House	Mrs. M. Stone			120.00		
Marquette	Warehouse	M. Sweder				120.00	
Negaunee	Room in Frt. Depot	American Express Co		300.00			
Baraga	Site for Shoe Shop	Jas. Burns				12.00	
L'Anse	Site for Lumber Yard	Marshall Butters Lbr. Co				450.00	
Marquette	Site for Warehouse	Armour & Co		300.00			
Negaunee	Site for Coal Shed	Jas. Pickands & Co		80.00			
Marquette	Site for Coal Dock	Jas. Pickands & Co		2,750.00			
Ishpeming	Site for Coal Shed	Jas. Pickands & Co		30.00			
Marquette	Site for Fish House	P. Anderson		100.00			
Newberry	Site for Warehouse	W. A. Everest			65.00		
Thomaston	Site for Dwellings	Employes				20.00	
Bergland	Site for Warehouse	G. A. Bergland			5.00		
Soo	Site for Dwellings	Various				61.00	
Wetmore	Site for Warehouse	Upper Michigan Potato Co			5.00		
Brimley	Site for Warehouse	Brimley Produce Co			10.00		
Ewen	Site for Fairgrounds	Ontonagon County Fair Assn				25.00	
Ishpeming	Site for Dwelling	L. Cain		1.00			
Sidnaw	Site for Warehouse	H. L. Kirkland & Co			5.00		
Baraga	Site for Ice House	Martin Ice Co				12.00	
Houghton	Site for Boat House, etc.	Various		9.00			
Negaunee	Site for Driveway	J. H. Sawbridge			1.00		
Soo	Site for Lumber Yard	Ritchie Lbr. Co				25.00	
L'Anse	Site for Dwelling	J. Krolick				8.00	
Negaunee	Site for Warehouse	Gannon Grocery Co			15.00		
Isle Royal	Site for Dwelling	Jos. Glendenning			1.00		
Trout Creek	Site for Warehouse	Dul. Brg. & Malting Co			5.00		
Ewen	Site for Warehouse	M. Greenough			20.00		
Nestoria	Site for Dwelling	H. Tourtillout			1.00		
Ewen	Site for Warehouse	Humphrey Merc. Co			10.00		
Marquette	Site for Coal Dock	F. B. Spear & Sons		1,625.00			
Strongs	Site for Warehouse	E. Torner			15.00		
Winthrop Jct	Site for Dwelling	Wm. Garceau			1.00		
Eckerman	Site for Lumber Yard	Brown Land & Lbr. Co			5.00		
Raco	Site for Warehouse	Richardson Avery			5.00		
Ishpeming	Site for Dwelling	Jas. McGee		1.00			
Chassell	Site for Yard	C. H. Worcester			1.00		
Sidnaw	Site for Dwelling	J. Swanson			1.00		
Ishpeming	Site for Dwelling	P. Gigere		1.00			
Ozark	Site for Warehouse	Central Paper Co			5.00		
Ewen	Site for Warehouse	J. N. Suets			10.00		
Ewen	Site for Warehouse	A. T. O'Rourke			10.00		
St. Ignace	Site for Oil Tank	Standard Oil Co		60.00			
Baraga	Site for Warehouse	Bosch Brg. Co				12.00	
Covington	Site for Warehouse	W. H. Oakley			12.00		
Baraga	Site for Warehouse	A. Gauthier				12.00	
Baraga	Site for Warehouse	Upper Penn. Brg. Co				12.00	
Newberry	Site for Warehouse	Upper Penn. Brg. Co			12.00		
St. Ignace	Site for Porch	C. H. Stanus			5.00		
Marquette	Site for Oil House	Marquette Gas Light Co		10.00			
				5,267.00	435.00	800.00	

COMPLAINANT'S EXHIBIT 203

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY CO.

Assignment of Rent of Buildings and Other Property (Mich.), Year ending June 30th, 1915.

Location	Description	Lessee	Passenger	Freight	Common	Excluded Land	Total
		Amount Fwd		5,267.00	435.00	809.00	
Seney	Site for Warehouse	Hargrave Bros			12.00		
Seney	Site for Warehouse	Stack Lumber Co			12.00		
Ishpeming	Site for Warehouse	Pabst Brg. Co		25.00			
Newberry	Site for Warehouse	Gettleman Brg. Co			12.00		
Soo	Site for Lumber Yard	Kelly & Meyer				25.00	
Newberry	Site for Warehouse	J. C. Foster			12.00		
L'Anse	Site for Lumber Yard	National Pole Co				60.00	
L'Anse	Site for Warehouse	Richter Brg. Co				10.00	
L'Anse	Site for Garden	J. Belanger				5.00	
L'Anse	Site for Dwelling	P. Brogan				12.00	
L'Anse	Site for Pasture	Wm. Peterson				5.00	
Marquette	Site for Garden	Wm. Dorais and Others				26.00	
Soo	Site for Shop	Northwestern Leather Co		12.00			
Negaunee	Site for Refrigerator	J. Parenchio		10.00			
Onota	Site for Store				1.00		
Michigamme	Site for Warehouse	E. M. Stenarud			5.00		
Trout Lake	Site for Dwelling	J. Anguilan			5.00		
Brimley	Site for Sidewalk	Superior Township			1.00		
Brimley	Site for Warehouse	Wm. Reipnard			10.00		
Kenton	Site for Store	Kenton Store Co			5.00		
Champion	Site for Coal Bin	L. J. Cardinal		5.00			
Watton	Site for Store	R. C. Kotila			5.00		
Laketon	Site for Warehouse	F. H. Richard			5.00		
Soo Jct	Site for Boarding House	Mrs. A. Nelson			32.50		
Ewen	Site for Oil Tank	Standard Oil Co			30.00		
Marquette	Carp Furnace	Pioneer Iron Co			1.00		
Trout Lake	Site for Dwelling	L. Hill			1.00		
Arnheim	Site for Office	H. Pumstein			5.00		
Arnheim	Site for Store	Nettie Bros			5.00		
Arnheim	Site for House and Barn	J. H. Rice			5.00		
Marquette	Site for Yard	J. D. Mangun		1.00			
Marquette	Site for Garden	H. P. Stafford				1.00	
Moran	Site for Warehouse	Superior Post Co			10.00		
Matchwood	Site for Highway	Matchwood Township			1.00		
Marquette	Site for Pasture	J. Shewemin				1.00	
Thomaston	Hotel	Julia A. Wood			35.00		
Trout Creek	Site for Warehouse	Trout Creek Mfg. Co			5.00		
Michigan	Section Houses				642.50		
Michigan	Thomaston Cottages					205.07	
Michigan	Rooms in Stations				122.50		
Nestoria	Lunch Counter	Mrs. A. Foster	12.00				
Champion	Lunch Counter	Mrs. M. Plattenberg	40.00				
Negaunee	Room in Depot	Western Express Co	30.00				
St. Ignace	Dock	Mac. Transportation Co		270.00			
Soo	Stall in Round House	Mich. Northern Power Co			365.00		
Various	Site for Tele. Poles	Mich. State Tel. Co			97.65		
Various	Site for Tele. Poles	Northern Power Co			7.35		
Newberry	Site for Tele. Poles	Newberry Water & Lt. Plant			1.00		
Trout Lake	Site for Dwelling	S. Matheson			1.00		
			82.00	5,590.00	1,885.50	1,159.07	8,716.57

SUMMARY:—Allocated	Pass.	Freight
	82.00	5,590.00
1,885.50 Common (35.25% P. 64.75% F.)	664.64	1,220.86
	746.64	6,810.86

COMPLAINANT'S EXHIBIT 203

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Joint Facility Revenue—Cr.—Year Ending June 30th, 1915.

MICHIGAN.

	Total	Freight	Passenger
From Sault Ste. Marie Bridge Switching Account. D. S. S. & A. Pro. of revenue earned by the Switching Account transferring freight across the International Bridge	992.53	992.53	
D. S. S. & A. Pro. of Sault Ste. Marie Bridge Co.'s revenue from local fares over the Bridge	130.28		130.28
D. S. S. & A. Pro. of amount collected by the Bridge Co. from the Michigan State Telephone Co. for the privilege of stringing wire over the Bridge	5.47	5.05	(1) .42
D. S. S. & A. Pro. of rentals received by the Sainte Marie Union Depot Co. for:			
Lunch Counter and Express Office in Passenger Station	271.87		271.87
Warehouse Sites (Freight)	170.00	170.00	
Use of Passenger Facilities by C. P. Ry.	723.46		723.46
Parcel Room Receipts	24.39		24.39
	2,318.00	1,167.58	1,150.42

Assignment of "Passenger" to Intrastate and Interstate.

		Intrastate	Interstate
130.28	All Interstate		130.28
.42	All Interstate		.42
1,019.72	(70.97% Intra. Rev. basis)	723.69	
	(29.03% Inter. Rev. basis)		296.03
		723.69	426.73

(1)—Divided between Freight and Passenger on relation of D. S. S. & A. freight revenue and passenger revenue to D. S. S. & A. total revenue on traffic passing over the Bridge.

Joint Facility Revenue—Dr.—Year Ending June 30th, 1915.

MICHIGAN.

	Paid to	Total	Freight	Passenger
Pro. of rental of office in Pass. Station at Negaunee	C.& N.W.Ry.	12.50		12.50
Intrastate, 70.97% (Rev. Basis)		$ 8.87		
Interstate, 29.03% (Rev. Basis)		3.63		
		$12.50		

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Hire of Equipment—1915.

	System	%	Mich.	%	Mich. Freight	%	Mich. Passenger	
Rent Received from Hire of Equipment:								
Locomotives leased to Soo Bridge Swch. Acct.	$7,595.00	84.82	$6,442.06	81.47	$5,248.36	18.53	$1,193.72	
Locomotives, Freight, leased to others	80.42		65.75		65.75			
Locomotives, Passenger, leased to others	365.29		298.66				298.66	
Locomotives, Switch, leased to others	132.00		107.92		104.57	3.38	3.35	
	$8,172.71		$6,914.41		$5,418.68		$1,495.73	
Passenger Train Cars	368.18		300.92				300.92	
Work Equipment	994.00		812.27	55.16	$ 448.05	44.84	$ 364.22	Pass. Intra.
	$9,534.89		$8,027.60		$5,866.73		$2,160.87	70.97% $1,534
Rent Paid for Hire of Equipment:								
For Freight Cars (Balance)	$1,534.58		$1,256.97		$1,256.97			
For Locomotives	448.64		367.48		354.82		12.66	
For Pass. Train Cars	643.54		527.11				527.11	
For Sleepers	1,586.28		1,299.34				1,299.34	
For Work Equipment	54.50		44.64	55.16	24.62	44.84	20.02	Pass. Intra.
	$4,267.50		$3,495.54		$1,636.41		$1,859.13	70.97% $1,319

Operating Acct. 336—Work Equip. Repairs, 1915:

Total, Mich.	$4,445—100%
Mich., Pass.	$1,993—44.84%

COMPLAINANT'S EXHIBIT 203

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Rents Received (Joint Facilities) Year ending June 30th, 1915.

MICHIGAN.

Main Line—Michigamme to Beaufort Jct., used by C. & N. W. Ry. freight trains	$ 2,816.95	Common
Main Line—Ishpeming to Marquette, used by C. & N. W. Ry. passenger trains	1,047.17	Passenger
Main Line—Negaunee to Calumet, used by C. & N. W. Ry. passenger trains	6,528.91	Passenger
Main Line—Champion to Calumet, used by C. M. & St. P. Ry. passenger trains	3,071.25	Passenger
Main Line—Houghton to Pilgrim, used by Mineral Range R. R. freight trains	4,135.20	Common
Main Line—Baraga to Zenith Jct., used by Zenith Lumber Co. freight trains	1,775.00	Common
Mine Yard Tracks—Ishpeming, used by switch engines of L. S. & I. Ry	1,208.88	Freight
Land, Negaunee, occupied by Union Depot (Passenger)	150.00	Passenger
Union Depot Tracks, Negaunee, used by C. & N. W. Ry. Co	57.00	Common
Enginehouses, Houghton, used by Mineral Range R. R. Co	124.40	Freight
	$ 20,914.76	

SUMMARY.

				Freight	Passenger
$ 8,784.15 Common assigned	Frt.	64.75%		$ 1,333.28	$ 10,797.33
	Pass.	35.25%		5,687.74	3,096.41
				$ 7,021.02	$ 13,893.74
$13,893.74 Passenger assigned	Intrastate	70.97%	$ 9,860.39		
	Interstate	29.03%	$ 4,033.35		

Apportionment of Miscellaneous Rents Paid Year ending June 30th, 1915.

MICHIGAN.

	Total	Freight	Passenger
Rent of land for freight sidings at Houghton, Mich	$42.00	$42.00	.....

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Rents Paid (Joint Facilities), Year ending June 30th, 1915.

MICHIGAN.

	Total	Freight	Passenger
Sault Ste. Marie Bridge Co. (International Bridge)—Bond Interest, Sinking Fund and Taxes are paid by the D. S. S. & A. Ry. Co., C. P. Ry. Co. and "Soo" Line, on basis of revenue (Freight and Pass.) earned by each on traffic that passes over the Bridge D. S. S. & A. Pro	$ 2,792.03	$ 2,294.45	$ 497.58①
Sault Bridge Switching Account—Yard at Sault Ste. Marie, Mich	2,406.48	2,406.48	
Sainte Marie Union Depot Co. at Sault Ste. Marie, Mich.—Proportion of Hire of Equipment and Taxes	1,408.79	330.70	1,078.09②
Mineral Range R. R. Co.—Yard Tracks at Houghton	1,258.55	1,258.55	
C. & N. W. Ry. Co.—Yard Tracks at Negaunee	398.31	398.31	
L. S. & I. Ry. Co.—Yard Tracks at Negaunee	470.73	470.73	
Mineral Range R. R. Co.—Roundhouse at Calumet (Pass. engines only)	317.60		317.60
	$ 9,052.49	$ 7,159.22	$ 1,893.27

Basis of division between Freight and Passenger:

①On relation of D. S. S. & A. freight revenue and passenger revenue to D. S. S. & A. total revenue on traffic passing over the bridge.

②Rental of equipment allocated according to service—Taxes on relation of cost of passenger and freight portion of the property to total cost.

Assignment to Intrastate and Interstate.

		Intra.	Inter.
497.58	All Inter.		$497.58
$1,395.69	Intra. 70.97%	$990.52	
	Inter. 29.03%		405.17
$1,893.27		$990.52	$902.75

COMPLAINANT'S EXHIBIT 203

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

IN MICHIGAN.

Estimated Loss by Application of Act 276.

Year 1915	Intrastate	Interstate	Total
Amount that could be obtained under a Two Cent Rate, except on fares of five miles or less and certain fares via Negaunee and Champion included herein, on which more than two cents could be obtained, as shown below:			
Adults, 2c. per mile	$398,850	$167,677	$566,527
Children, 1c. per mile	3,987	2,132	6,119
	$402,837	$169,809	$572,646
Add:			
Amount in excess of 2c. per mile that could be obtained from fares of five miles or less	1,908		1,908
Amount in excess of 2c. per mile that could be obtained on certain business via Negaunee and Champion	123	4,660	4,783
Total	$404,868	$174,469	$579,337
Amount that was received under Three Cent Rate	$530,048	$216,824	$746,872
Loss, 1915	$125,180	$ 42,355	$167,535

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Special Service Train Revenue—Year Ended June 30th, 1915.

Month	Item	Entire Line		Mich.		Mich. Intrastate	
		Frt.	Pass.	Frt.	Pass.	Frt.	Pass.
(1914)							
July	E. D. Babst		42.00		42.00		42.00
	C. & N. W. Ry.		50.00		50.00		50.00
	Jones Bros. & Wilson Circus	10 Cars 966.67	5 Cars 483.33	781.63	390.82	764.67	382.33
Sept.	Millers Carnival	25 Cars 546.87	7 Cars 153.13	546.87	153.13	546.87	153.13
Nov.	Sept. Morn Theatrical Co.		73.50		73.50		73.50
(1915)							
June	Everywoman Theatrical Co.		286.00		270.02		
June	Nat Reiss Famous Shows	11 Cars 296.15	2 Cars 53.85	296.15	53.85	296.15	53.85
		1,809.69	1,141.81	1,624.65	1,033.32	1,607.69	754.81

*Difference of $10.50 between the sum of the Michigan Intrastate columns and amount shown in report to Michigan Railroad Commission is accounted for by an error in including $10.50 too much in the Intrastate column and $10.50 too little in the Interstate column of the report.

COMPLAINANT'S EXHIBIT 203

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Freight Statistics—Year ending June 30th, 1915.

MICHIGAN.

	Net Tons	Tons One Mile	Revenue
Freight other than Interstate Iron Ore	1,827,791	171,682,196	1,440,442.96
Iron Ore to Marquette Docks, all Interstate	715,956	9,809,610	162,667.05
Total Michigan Freight	2,543,747	181,491,806	1,603,110.01
Michigan Intrastate Freight	**Net Tons**	**Tons One Mile.**	**Revenue**
	884,836	65,461,581	625,202.01
Percent of Freight other than Iron Ore	48.41	38.13	43.40
Percent of Total Michigan Freight	34.78	36.07	39.00
Michigan Interstate Freight	**Net Tons**	**Tons One Mile**	**Revenue**
Freight other than Iron Ore	942,955	106,220,615	815,240.95
Percent of Freight other than Iron Ore	51.59	61.87	56.60
Iron Ore to Marquette Docks	715,956	9,809,610	162,667.05
	1,658,911	116,030,225	977,908.00
Percent of Total Michigan Freight	65.22	63.93	61.00

Freight other than Iron Ore—Michigan:
- Rate per ton per mile ..... .00839
- Average rate per ton ..... .78808
- Average distance hauled ..... 93.92 mi.

Total Freight—Michigan:
- Rate per ton per mile ..... .00883
- Average rate per ton ..... .63021
- Average distance hauled ..... 71.35 mi.

Iron Ore to Docks—Michigan:
- Rate per ton per mile ..... .01658
- Average rate per ton ..... .22720
- Average distance hauled ..... 13.70 mi.

All Michigan Intrastate Freight:
- Rate per ton per mile ..... .00955
- Average rate per ton ..... .70657
- Average distance hauled ..... 73.98 mi.

Michigan Interstate Freight other than Iron Ore:
- Rate per ton per mile ..... .00767
- Average rate per ton ..... .86456
- Average distance hauled ..... 112.65 mi.

All Michigan Interstate Freight:
- Rate per ton per mile ..... .00843
- Average rate per ton ..... .58948
- Average distance hauled ..... 69.94 mi.

ENTIRE LINE.

Number of Net Tons carried	Freight	1,964,942
Number of Net Tons carried	Iron Ore to Docks	715,956
Number of Net Tons carried	All Freight	2,680,898
Number of Net Tons carried one mile	Freight	197,490,512
Number of Net Tons carried one mile	Iron Ore to Docks	9,809,610
Number of Net Tons carried one mile	All Freight	207,300,122
Average Net Ton haul		77.34 mi.
Rate per ton per mile		.00875

COMPLAINANT'S EXHIBIT 204

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Statement of Mileage Owned

FROM	TO	July, 1915 to Dec., 1915, inc.		Jan., 1916 to June, 1916, inc.	
		Entire Line	Mich.	Entire Line	Mich.
Main Line:					
S. S. Marie.....Mich.	Superior.....Wis.	408.69	301.54	408.72	301.57
Soo Junction..... "	St. Ignace.....Mich.	42.97	42.97	42.97	42.97
Marquette..... "	Winthrop Jct..... "	17.33	17.33	17.33	17.33
Nestoria..... "	Houghton..... "	48.24	48.24	48.20	48.20
Humboldt..... "	Republic..... "	8.70	8.70	8.76	8.76
Branches:					
Negaunee..... "	Volunteer Mine..... "	4.19	4.19	5.00	5.00
Bessemer Jct..... "	Bessemer..... "	2.23	2.23	2.03	2.03
Spurs for traffic purposes.....		68.30	66.80	67.62	66.25
Total.....		600.65	492.00	600.63	492.11
Percent.....		100.00	81.91	100.00	81.93

Statement of Revenue Locomotive Miles

ENTIRE LINE

	July, 1915 to Dec., 1915, inc.		Jan., 1916 to June, 1916, inc.		Year Ending June 30th, 1916	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Freight Loco. Miles.....	462,761	385,168	509,466	424,072	972,227	809,240
Passenger Loco. Miles.....	471,526	389,028	464,010	383,438	935,536	772,466
Mixed Loco. Miles.....	8,648	8,648	8,272	8,272	16,920	16,920
Spl. Serv. Loco. Miles.....	1,110	811	1,483	1,269	2,593	2,080
Train Switch'g Loco. Miles	68,999	58,238	78,045	64,739	147,044	122,977
Yard Switch'g Loco. Miles.....	151,525	149,563	145,399	138,019	296,924	287,582
Total.....	1,164,569	991,456	1,206,675	1,019,809	2,371,244	2,011,265
Percent.....	100.00	85.13	100.00	84.51	100.00	84.81

Statement of Freight Locomotive Mileage

ENTIRE LINE

	July, 1915 to Dec., 1915, inc.		Jan., 1916 to June, 1916, inc.		Year ending June 30th, 1916	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Freight Loco. Miles.....	462,761	385,168	509,466	424,072	972,227	809,240
Frt. Train Swg. Loco. Miles.....	67,889	57,128	76,953	63,647	144,842	120,775
Total.....	530,650	442,296	586,419	487,719	1,117,069	930,015
Percent.....	100.00	83.35	100.00	83.17	100.00	83.25
Mixed Loco. Miles (including Spl. Serv. Mixed).....	7,742	7,687	7,969	7,820	15,711	15,507
Total.....	538,392	449,983	594,388	495,539	1,132,780	945,522
Percent.....	100.00	83.58	100.00	83.37	100.00	83.47

COMPLAINANT'S EXHIBIT 204

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Statement of Passenger Locomotive Mileage.

ENTIRE LINE

	July, 1915 to Dec., 1915, inc.		Jan., 1916 to June, 1916, inc.		Year Ending June 30th, 1916	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Passenger Loco. Miles	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Exp., Frgt. Reg. Loco. Miles	1,110	1,110	1,073	1,073	2,073	2,073
Spl. Serv. Loco. Miles (Pass.)	204	204	203	203	376	376
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Percent	100.00	89.57	100.00	89.69	100.00	89.61
Mixed Loco. Miles (including Spl. Serv. Mixed)	1,522	1,466	1,404	1,339	2,926	2,807
Total	474,662	391,910	466,888	386,261	941,540	778,161
Percent	100.00	82.57	100.00	82.76	100.00	82.65

Statement of Mixed Locomotive Mileage.

ENTIRE LINE

July, 1915 to Dec., 1915, inc.

	Mich.	Wis.	Total
Mixed Loco. Miles	8,648		8,648
Mixed Spl. Serv. Loco. Miles	507	109	616
Total	9,155	109	9,264
Percent	98.82	1.18	100.00

Divided between Freight and Passenger service, on bases of mileage of cars in mixed trains.

Car Miles			Frt.	Pass.	Frt.	Pass.	
Mich. Frt.	102,107	83.97% of 9,155	7,687				
Mich. Pass	21,403	16.03% of 9,155		1,468			
Wis. Frt.	432	50.00% of 109			55		
Wis. Pass.	432	50.09% of 109				54	
			7,687	1,468	55	54	9,264

Jan., 1916 to June, 1916, Inc.

Mixed Loco. Miles			8,272				8,272
Mixed Spl. Service Loco. Miles			897		914		1,101
Total			9,169		314		9,373
Percent			97.73		3.26		100.00
Car Miles			Frt.	Pass.	Frt.	Pass.	
Mich. Frt.	116,011	85.26% of 9,169	7,820				
Mich. Pass.	19,870	14.62% of 9,169		1,339			
Wis. Frt.	1,000	68.49% of 314			149		
Wis. Pass.	730	50.47% of 314				65	
			7,820	1,339	149	65	9,373

COMPLAINANT'S EXHIBIT 204

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Passenger Proportion of Michigan Revenue Locomotive Mileage.

Year Ending June 30th, 1916.

MICHIGAN.

	Total Mich. Revenue Locomotive Mileage	*Passenger Por. of Mich. Revenue Locomotive Mileage*
Freight Locomotive Miles	[illegible]	
Passenger Locomotive Miles	772,466	772,466
Mixed Locomotive Miles	[illegible]	2,897
Special Service Loco. Miles (Mixed)	[illegible]	
Special Service Loco. Miles (Pass.)	[illegible]	666
Train Switching Loco. Miles	122,977	2,202
Yard Switching Loco. Miles	[illegible]	17,943
Total	2,011,265	796,104
Per cent	100.00	39.58

Statement of Revenue Locomotive Mileage, Showing Special Service Mileage Distributed to Freight and Passenger Service for the Year Ending June 30th, 1916.

ENTIRE LINE.

	Entire Line	Mich.
Freight Locomotive Miles	972,227	809,240
Frt. Train Switching Loco. Miles	144,842	120,775
Total	1,117,069	930,015
Percent	100.00	83.25
Passenger Locomotive Miles	935,536	772,466
Pass. Train Switching Loco. Miles	2,202	2,202
Pass. Spl. Service Loco. Miles	876	666
Total	938,614	775,354
Percent	100.00	82.61
Mixed Locomotive Miles	16,930	16,930
Mixed Locomotive Miles (Spl. Service)	1,717	1,394
Total	18,647	18,324
Percent	[illegible]	[illegible]
Yard Switching Locomotive Miles:		
Freight (Mich. 93.76%)	[illegible]	[illegible]
Passenger (Mich. 6.94%)	17,943	17,943
Total	[illegible]	[illegible]
Percent	[illegible]	[illegible]

COMPLAINANT'S EXHIBIT 204

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Revenue Train Mileage.

ENTIRE LINE

	July, 1915, to Dec., 1915, inc.		Jan., 1916, to June, 1916, inc.		Year Ending June 30th, 1916.	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Freight Train Miles	437,595	361,521	473,878	390,803	911,473	752,324
Passenger Train Miles*	458,373	377,573	449,239	370,472	907,612	748,045
Mixed Train Miles	8,648	8,648	8,272	8,272	16,920	16,920
Special Service Train Miles	982	735	1,361	1,147	2,343	1,882
Total*	905,598	748,477	932,750	770,694	1,838,348	1,519,171
Per cent	100.00	82.65	100.00	82.62	100.00	82.64

Statement of Freight Train Mileage, including Proportion of Mixed and Special Service Train Miles.

ENTIRE LINE.

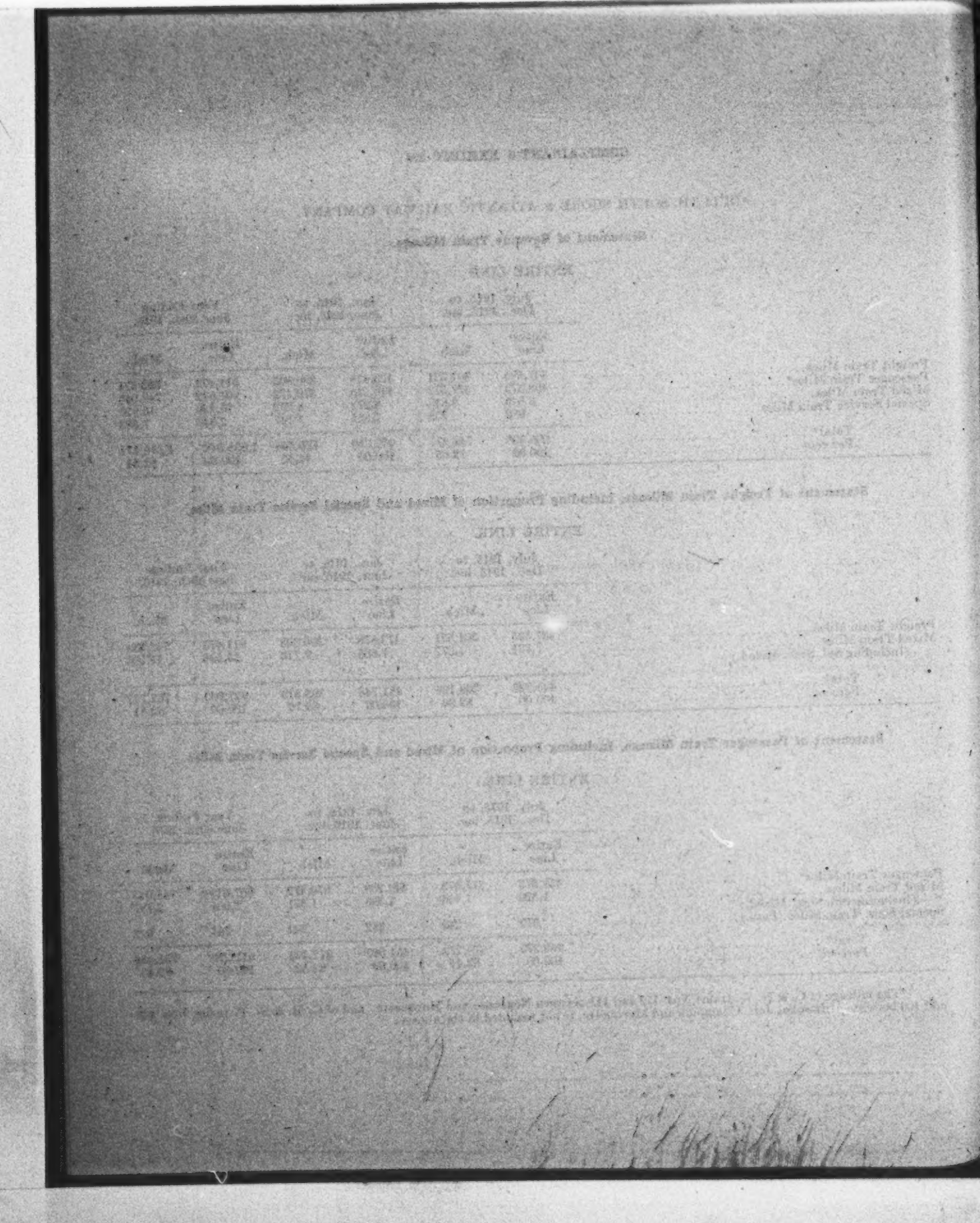
	July, 1915, to Dec., 1915, inc.		Jan., 1916, to June, 1916, inc.		Year Ending June 30th, 1916.	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Freight Train Miles	437,595	361,521	473,878	390,803	911,473	752,324
Mixed Train Miles (Including Spl. Serc. Mixed.)	7,731	7,677	7,865	7,716	15,596	15,393
Total	445,326	369,198	481,743	398,519	927,069	767,717
Percent	100.00	82.90	100.00	82.72	100.00	82.81

Statement of Passenger Train Mileage, Including Proportion of Mixed and Special Service Train Miles.

ENTIRE LINE.

	July, 1915, to Dec., 1915, inc.		Jan., 1916, to June, 1916, inc.		Year Ending June 30th, 1916.	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Passenger Train Miles*	458,373	377,573	449,239	370,472	907,612	748,045
Mixed Train Miles (Including Spl. Serc. Mixed.)	1,520	1,466	1,386	1,321	2,906	2,787
Special Serv. Train Miles (Pass.)	379	240	382	382	761	622
Total*	460,272	379,279	451,007	372,175	911,279	751,454
Percent	100.00	82.41	100.00	82.52	100.00	82.45

*The mileage of C. & N. W. trains Nos. 110 and 111 between Negaunee and Marquette, and of C. M. & St. P. trains Nos. 105 and 106 between Milwaukee Jct., Champion and Marquette, is not included in the above.



COMPLAINANT'S EXHIBIT 204

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Passenger Proportion of Michigan Revenue Train Mileage—Year ending June 30th, 1916.

MICHIGAN.

	Total Mich. Rev. Train Mileage	Pasgr. Pro. of Mich. Rev. Train Mileage
Freight Train Miles	752,324	
Passenger Train Miles	748,045	748,045
Mixed Train Miles (including Spl. Service Mixed)	18,180	2,787
Special Service Train Miles (Pass.)	622	622
Total	1,519,171	751,454
Percent	100.00	49.46
Mileage of C. M. & St. P. Trains Nos. 105 and 106 over D. S. S. & A. tracks	20,724	20,724
Mileage of C. & N. W. Trains Nos. 110 and 111 over D. S. S. & A. tracks	10,980	10,980
Total	1,550,875	783,158
Percent	100.00	50.50

Statement of Mixed Train Miles, Entire Line, July, 1915 to Dec., 1915, inc.

	Mich.	Wis.	Total
Mixed Train Miles	8,648		8,648
Mixed Spl. Service Train Miles	495	108	603
Total	9,143	108	9,251
Percent	98.83	1.17	100.00

Divided between Freight and Passenger service on basis of mileage of cars in mixed trains:

	Car Miles			Frt.	Pass.	Frt.	Pass.	
Mich.—Freight	102,107	83.97% of	9,143	7,677				
Mich.—Passenger	21,403	16.03% of	9,143		1,466			
Wis.—Freight	432	50.00% of	108			54		
Wis.—Passenger	432	50.00% of	108				54	
				7,677	1,466	54	54	9,251

July, 1916 to June, 1916, inc.

Mixed Train Miles				8,272				8,272
Mixed Spl. Service Train Miles				765			214	979
Total				9,037			214	9,251
Percent				97.69			2.31	100.00
	Car Miles			Frt.	Pass.	Frt.	Pass.	
Mich.—Freight	116,011	85.38% of	9,037	7,716				
Mich.—Passenger	19,870	14.62% of	9,037		1,321			
Wis.—Freight	1,686	69.53% of	214			149		
Wis.—Passenger	739	30.47% of	214				65	
				7,716	1,321	149	65	9,251

COMPLAINANT'S EXHIBIT 204

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Passenger Car Mileage

ENTIRE LINE.

	July 1915, to Dec., 1915, inc.		Jan., 1916, to June, 1916, inc.		Year ending June 30th, 1917	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Passenger Train Car Miles:						
Passenger Cars	1,028,083	856,760	962,955	798,857	1,991,038	1,655,617
Slp., Parlor and Obs. Cars—Foreign	70,146	70,146	70,084	70,084	140,230	140,230
Slp., Parlor and Obs. Cars—D. S. S. & A. Sleepers	353,824	265,850	335,351	250,483	689,175	516,333
Slp., Parlor and Obs. Cars—D. S. S. & A. Obs. Cars	90,528	90,528	89,086	89,086	179,614	179,614
Dining Cars—D. S. S. & A.	84,798	57,628	86,605	57,970	171,403	115,598
Dining Cars—Foreign	42,332	42,332	33,710	33,710	76,042	76,042
Other Passenger Train Cars	518,540	433,258	496,417	410,496	1,014,957	843,754
Mixed Train Car Miles:						
Passenger Cars	19,243	19,243	16,565	16,565	35,808	35,808
Other Pass. Train Cars	188	188	94	94	282	282
Special Train Car Miles:						
Passenger Cars	1,631	1,415	4,575	3,836	6,206	5,251
Slp., Parlor and Obs. Cars	80	80			80	80
Dining Cars	80	80			80	80
Other Pass. Train Cars	1,877	1,225	105	105	1,982	1,330
Total	2,211,350	1,838,733	2,095,547	1,731,286	4,306,897	3,570,019
Percent	100.00	83.15	100.00	82.65	100.00	82.92

Statement of D. S. S. & A. Sleeping and Dining Car Mileage, including Mileage made on Mineral Range R. R.

ENTIRE LINE.

	July, 1915, to Dec., 1915, inc.		Jan., 1916, to June, 1916, inc.		Year Ending June 30th, 1916	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Sleeping Cars	364,302	276,328	345,294	260,426	709,596	536,754
Percent	100.00	75.85	100.00	75.61	100.00	75.74
Dining Cars	84,798	57,628	86,605	57,970	171,403	115,598
Observation Cars	95,680	95,680	93,548	93,548	189,228	189,228
Total	180,478	153,308	180,153	151,518	360,631	304,826
Percent	100.00	84.95	100.00	84.11	100.00	84.53

DULUTH SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Freight Car Mileage.

ENTIRE LINE.

	July, 1915, to Dec., 1915, inc.		Jan., 1916, to June, 1916, inc.		Year Ending June 30th, 1916	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Freight Train Car Miles:						
Loaded	6,036,864	5,158,409	6,546,534	5,541,245	12,583,398	10,699,654
Empty	2,781,607	2,425,386	3,196,069	2,858,937	5,977,676	5,284,323
Caboose	427,217	351,283	462,257	379,190	889,474	730,473
Mixed Train Car Miles:						
Freight—Loaded	59,779	59,779	52,265	52,265	112,044	112,044
Freight—Empty	40,356	40,356	55,877	55,877	96,233	96,233
Special Train Car Miles:						
Freight—Loaded	2,404	1,972	8,610	7,140	11,014	9,112
Freight—Caboose			945	729	945	729
Total	9,348,227	8,037,185	10,322,557	8,895,383	19,670,784	16,932,568
Percent	100.00	85.98	100.00	86.17	100.00	86.07

Statement of Non-Revenue Car Miles.

ENTIRE LINE.

	July, 1915, to Dec., 1915, inc.		Jan., 1916, to June, 1916, inc.		Year Ending June 30th, 1916	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Non-Revenue Car Miles	119,594	29,273	90,269	73,848	209,863	103,121
Percent	100.00	24.48	100.00	81.81	100.00	49.14

COMPLAINANT'S EXHIBIT 204

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Year ending June 30th, 1916.

ENTIRE LINE.

Operating Revenue	3,506,792.22	
Operating Expenses	2,482,148.51	
Net Operating Revenue		1,024,643.71
Railway Tax Accruals	251,780.46	
Uncollectible Railway Revenue	249.63	252,030.09
Railway Operating Income		772,613.62
Other Income:		
Rent from Locomotives	15,515.28	
Rent from Passenger Train Cars	394.38	
Rent from Work Equipment	1,376.18	
Joint Facility Rent Income	19,421.41	
Miscellaneous Rent Income	202.31	
Miscellaneous Non-operating Physical Property	5,688.46	
Income from Unfunded Securities and Accounts	9,990.84	
Income from Sinking and other Reserve Funds	1,069.38	
Income from Funded Securities	5,020.38	58,678.62
Gross Income		831,292.24
Deductions from Gross Income:		
Hire of Freight Cars (Balance)	21,824.82	
Rent for Locomotives	3,473.70	
Rent for Passenger Train Cars	2,059.73	
Rent for Work Equipment	2.31	
Joint Facility Rents	38,482.24	
Miscellaneous Rents	44.15	
Miscellaneous Tax Accruals	1,077.70	
Separately Operated Properties	30,048.62	
Miscellaneous Interest	8.42	
Miscellaneous Income Charges	569.75	
Total Deductions (Interest on Funded Debt not included)		97,591.44
		733,700.80

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Revenue—Year ending June 30th, 1916.

	Entire Line	Michigan	
Freight Revenue	2,316,447.79	2,067,558.74	
Switching Revenue	21,369.69	12,234.63	
Special Service Train Revenue	3,002.83	2,356.86	
Other Freight	61.90	61.90	
Storage—Freight	981.46	935.53	
Demurrage	6,317.00	5,920.15	
Miscellaneous (Dockage and Handling Iron Ore)	50,866.33	50,866.33	
Total Freight Revenue	2,399,547.00	2,139,934.16	69.09%
Passenger Service Train Revenue	1,003,682.29	865,265.54	
Sleeping Car Revenue	39,450.13	30,390.46	
Parlor and Chair Car Revenue	4,488.65	4,488.65	
Dining and Buffet Car Revenue	35,240.77	27,938.97	
Special Service Train Revenue	2,260.41	1,612.13	
Station, Train and Boat Privileges	600.00	494.52	
Parcel Room Revenue	522.55	522.55	
Storage—Baggage	82.10	82.10	
Total Passenger Revenue	1,086,326.90	930,794.92	30.31%
			100.00%
Telegraph Service Revenue	612.54	579.16	
Rents of Buildings and Other Property	7,582.68	7,495.33	
Miscellaneous	5,468.12	5,281.80	
Total	13,663.34	13,356.29	
Joint Facility Revenue—Dr	396.64	396.64	
Joint Facility Revenue—Cr	7,651.62	2,644.62	
Total	7,254.98	2,247.98	
Total Operating Revenue	3,506,792.22	3,086,333.35	

COMPLAINANT'S EXHIBIT 204

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Revenue Year Ending June 30th, 1916.

MICHIGAN.

	Total	Assigned to Freight	Assigned to Passenger
Freight Revenue	2,067,558.74	2,067,558.74	
Switching Revenue	12,234.63	12,234.63	
Special Service Train Revenue	2,356.88	2,356.88	
Other Freight Train Revenue	61.90	61.90	
Storage—Freight	935.53	935.53	
Demurrage	5,920.15	5,920.15	
Miscellaneous (Dockage and Handling Iron Ore)	50,866.33	50,866.33	
		2,139,934.16 69.69%	
Passenger Train Revenue	865,265.54		865,265.54
Sleeping Car Revenue	30,390.46		30,390.46
Parlor and Chair Car Revenue	4,488.65		4,488.65
Dining and Buffet Car Revenue	27,938.97		27,938.97
Special Service Train Revenue	1,612.13		1,612.13
Station Train and Boat Privileges	494.52		494.52
Parcel Room Revenue	522.55		522.55
Storage—Baggage	82.10		82.10
	2,070,729.08		930,794.92 30.31%
Telegraph Service Revenue, Frt., 60.69%; Pass. 30.31%	579.16	397.83	181.33
Rents of Buildings and Other Property	*7,495.33	6,042.57	530.76
Miscellaneous	5,281.80	4,604.77	677.03
Joint Facility Revenue (Balance)	2,247.98	1,135.82	1,112.16
	15,604.27		
Total Operating Revenue	3,086,333.35	2,152,115.15	933,296.20

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Year Ending June 30th, 1916.

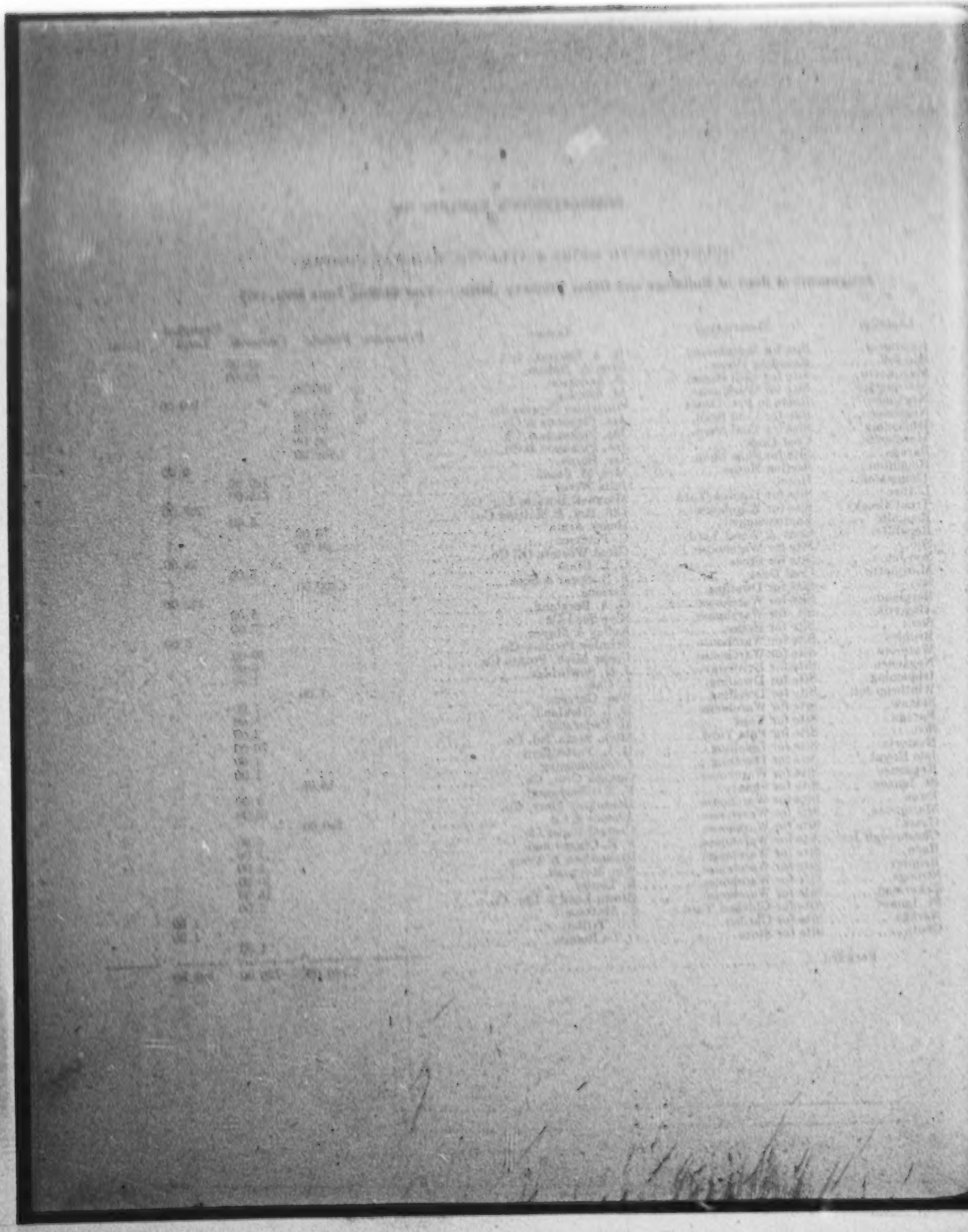
No. of Passengers	Passengers One Mile	Average Haul	Rate per Passenger Per Mile
	MICHIGAN		
689,364—100%	29,662,083—100%	43.06	.02597
	INTRASTATE		
614,904—89.2%	21,016,459—70.81%	34.17	.02589
	INTERSTATE		
74,460—10.8%	8,665,624—29.19%	116.37	.02615
	ENTIRE LINE		
747,965	35,014,050	46.81	.02543

COMPLAINANT'S EXHIBIT 824

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Assignment of Rent of Buildings and Other Property (Mich.)—Year Ending June 30th, 1915

Location	Description	Lessee	Passenger	Freight	Common	Excluded Land	Total
Newberry	Site for Warehouse	W. A. Everett			60.00		
Soo Jct	Boarding House	Mrs. A. Nelson			60.00		
Marquette	Site for Fish House	P. Anderson		100.00			
Marquette	Site for Warehouse	M. Sweder				120.00	
Negaunee	Room in Frt. Depot	American Express Co.		300.00			
Negaunee	Site for Coal Shed	Jas. Pickands & Co.		80.00			
Ishpeming	Site for Coal Shed	Jas. Pickands & Co.		30.00			
Marquette	Coal Dock	Jas. Pickands & Co.		2,700.00			
Baraga	Site for Shoe Shop	Jas. Burns				9.00	
Houghton	Section House	Mrs. M. Stone			120.00		
Thomaston	Hotel	Julia Wood			315.00		
L'Anse	Site for Lumber Yard	Marshall Butters Lbr. Co.				225.00	
Trout Creek	Site for Warehouse	Dul. Brg. & Malting Co.			5.00		
Republic	Encroachment	Henry Arala		10.00			
Republic	Coal & Wood Yard	C. Peterson		24.00			
Soo	Site for Warehouse	Great Western Oil Co.				25.00	
Soo Jct	Site for Store	C. L. Clark			5.00		
Marquette	Coal Dock	F. B. Spear & Sons		1,300.00			
Soo	Site for Dwelling	Various				122.00	
Bergland	Site for Warehouse	G. A. Bergland			5.00		
Allenville	Site for Warehouse	Rice Seed Co			10.00		
Soo	Site for House	Kelley & Mayer				5.00	
Brimley	Site for Warehouse	Brimley Produce Co.			10.00		
Watmore	Site for Warehouse	Upper Mich. Potato Co.			5.00		
Negaunee	Site for Driveway	J. H. Sawbridge			1.00		
Ishpeming	Site for Dwelling	L. Cain		1.00			
Winthrop Jct	Site for Dwelling	Wm. Garceau			1.00		
Sidnaw	Site for Warehouse	H. L. Kiekland			5.00		
Baraga	Site for Yard	M. Paderwiski			2.00		
Soo	Site for Pole Yard	Mich. State Tel. Co.			70.00		
Nestoria	Site for Dwelling	H. L. Tertoullout			1.00		
Isle Royal	Site for Dwelling	J. Glendenning			1.00		
Negaunee	Site for Warehouse	Gannon Groc. Co.		15.00			
St. Ignace	Site for Shanty	F. X. Charlwood			1.00		
Ewen	Site for Warehouse	Humphrey Merc. Co.			10.00		
Marquette	Site for Warehouse	Armour & Co.		180.00			
Ozark	Site for Warehouse	Central Paper Co.			5.00		
Chesbrough Jct.	Site for Warehouse	F. E. Chesbrough			1.00		
Raco	Site for Warehouse	Richardson & Avery			5.00		
Brimley	Site for Warehouse	Wm. Reynard			10.00		
Strongs	Site for Warehouse	E. Turner			15.00		
Eckerman	Site for Warehouse	Brown Land & Lbr. Co.			5.00		
St. Ignace	Site for Chicken Yard	C. Matteon				1.00	
Naraga	Site for Garden	J. J. Trilbey				1.00	
Onota	Site for Store	O. La Beauty			1.00		
Forward				4,740.00	729.00	508.00	



COMPLAINANT'S EXHIBIT 224

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Assignment of Rent of Buildings and Other Property (Mich.)—Year Ending June 30th, 1918

Location	Description	Lessee	Passenger	Freight	Common	Excluded Land	Total
		Brought Froward		4,740.00	739.00	538.00	
Soo	Site for Mill	Northwestern Leather Co		12.00			
Ishpeming	Site for Dwelling	J. McGee		1.00			
Ishpeming	Site for Dwelling	P. Gigere		1.00			
Trout Lake	Site for Dwelling	J. Anguilan			5.00		
Chassell	Site for Yard	C. H. Worcester			1.00		
Herman	Site for Store	Cons. Fuel & Lbr. Co.			10.00		
Marquette	Carp Furnace	Pioneer Iron Co.			1.00		
Sidnaw	Site for Dwelling	J. Swanson			1.00		
Marquette	Site for Garden	Various				26.00	
Newberry	Site for Warehouse	J. C. Foster			12.00		
Baraga	Site for Warehouse	Bosch Brewing Co.				12.00	
Newberry	Site for Warehouse	Upper Pen. Brewing Co.			12.00		
Ishpeming	Site for Warehouse	Pabst Brewing Co.		25.00			
Arnheim	Site for House	J. H. Rice			5.00		
Kenton	Site for Store	Kenton Store Co.			5.00		
Seney	Site for Warehouse	Hargrave Bros.			12.00		
Seney	Site for Warehouse	Stack Lumber Co.			12.00		
Marquette	Site for Oil House	Marquette Gas Light Co.		10.00			
Ewen	Site for Warehouse	J. H. Suits			10.00		
Ewen	Site for Warehouse	A. T. O'Rourke			10.00		
L'Anse	Site for Lumber Yard, etc.	National Pole Co.				60.00	
Newberry	Site for Warehouse	Gettleman Brg. Co.			12.00		
Arnheim	Site for Store	Nettie Bros.			5.00		
St. Ignace	Site for Porch	C. H. Stannus			5.00		
Baraga	Site for Warehouse	Upper Pen. Brewing Co.				12.00	
Soo	Site for Mill	Kelly & Meyer				25.00	
Brimley	Site for Sidewalk	Superior Township			1.00		
St. Ignace	Site for Oil Tank	Standard Oil Co.		60.00			
Negaunee	Site for Refrigerator	J. Parenchio		10.00			
L'Anse	Site for Pasture	Wm. Peterson				5.00	
L'Anse	Site for Dwelling	P. Brogan				12.00	
Baraga	Site for Oil Tank	Standard Oil Co.			60.00		
Baraga	Site for Warehouse	A. Gauthier				12.00	
Covington	Site for Warehouse	W. H. Oakley			12.00		
L'Anse	Site for Garden	J. Belanger				5.00	
Newberry	Site for Poles	Newberry Water & Lt. Plant			.70		
Matchwood	Site for Highway	Township of Matchwood			1.00		
Michigamme	Site for Coal Shed	A. Olson			5.00		
Baraga	Site for Chicken Yard	N. Clish			1.00		
Moran	Site for Building	Superior Post Co.			10.00		
Marquette	Site for Bill Board	Delph Poster Add. Co.			5.00		
Champion	Site for Coal Bin	L. J. Cardinal		5.00			
Trout Lake	Site for Dwelling	L. Hill			1.00		
Thomaston	Site for Hotel	Gus Raymond			105.00		
Ewen	Site for Warehouse	Standard Oil Co.			30.00		
Baraga	Site for Warehouse	P. Foucault				12.00	
Marquette	Site for Garden	H. P. Stafford				1.00	
Marquette	Site for Pasture	J. Schwemin				1.00	
Marquette	Site for Yard	J. D. Mangum		1.00			
		Forward		4,865.00	1,078.70	691.00	

COMPLAINANT'S EXHIBIT 204

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Assignment of Rent of Buildings and Other Property (Mich.)—Year Ending June 30th, 1916

Location	Description	Lessee	Passenger	Freight	Common	Excluded Land	Total
Brought Forward				4,865.00	1,078.70	691.00	
St. Ignace	Site for Pasture	J. T. Golden				1.00	
Trout Creek	Site for Warehouse	Trout Creek Mfg. Co.			5.00		
Ewen	Site for Warehouse	M. Greenough			10.00		
Various	Site for Poles	Mich. State Tel. Co.			58.63		
Baraga	Site for Garden	J. J. Trilvey			1.00		
Republic	Site for Wood Yard	L. La Forais		6.00			
Ewen	Site for Warehouse	Ewen Livery Co.			10.00		
Shingleton	Site for Building	E. Cookson			2.50		
Houghton	Site for Boat Houses	Various		34.00			
Thomaston	Site for Property	Various				30.00	
Michigan	Site for Station Rooms				108.50		
Michigan	Thomaston Cottages					200.00	
Champion	Lunch Counter		24.00				
Nestoria	Lunch Counter		12.00				
Soo	Stall in Round House				358.00		
			36.00	4,905.00	1,632.33	922.00	7,495.33

SUMMARY

	Passenger	Freight
Allocated	36.00	4,905.00
$1,632.33 Com. divided on Revenue basis—Pass. 30.31%	494.76	1,137.57
	530.76	6,042.57
	$6,573.33	

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Joint Facility Revenue—Cr.—Year Ending June 30th, 1916.

MICHIGAN.

	Total	Freight	Passenger
From Sault Ste. Marie Bridge Switching Account, D. S. S. & A. Pro. of revenue earned by the Switching Account transferring freight across the International Bridge	1,170.49	1,170.49	
D. S. S. & A. Pro. of Sault Ste. Marie Bridge Co.'s revenue from local fares over the Bridge	217.28		217.28
D. S. S. & A. Pro. of amount collected by the Bridge Co. from the Michigan State Telephone Co. for the privilege of stringing wire over the Bridge	13.84	11.76	*2.08
D. S. S. & A. Pro. of rentals received by the Sainte Marie Union Depot Co. for:			
Lunch counter and Express Office in Passenger Station	289.65		289.65
Warehouse sites (Freight)	230.00	230.00	
Use of Passenger Facilities by C. P. Ry.	697.96		697.96
Parcel Room Receipts	25.40		25.40
	2,644.62	1,412.25	1,232.37

Assignment of "Passenger" to Intrastate and Interstate.

		Intrastate	Interstate
$ 217.28	All Interstate		217.28
2.08	All Interstate		2.08
1,013.01	70.6% Intrastate	715.19	
	29.4% Interstate		297.82
1,232.37		715.19	517.18

*Divided between Freight and Passenger on relation of D. S. S. & A. freight revenue and passenger revenue to D. S. S. & A. total revenue on traffic passing over the Bridge.

Joint Facility Revenue—Dr.—Year Ending June 30th, 1916.

MICHIGAN.

	Paid to	Total	Freight	Passenger
Pro. of rent of stall in Soo Round House	M. St. P. & S. S. M. Ry.	$396.64	$276.43	$120.21
Divided Freight 69.69%—Pass. 30.31%. Revenue basis.				
Passenger	Intra. 70.6%—$84.87			
	Inter. 29.4%— 35.34			

COMPLAINANT'S EXHIBIT 204

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Hire of Equipment—1916.

	System	%	Mich.	%	Mich. Frt.	%	Mich. Passgr.		
Rent Received from Hire of Equipment:									
Locomotives leased to Soo Bdge.Swch.Acct.	$ 7,710.00	84.82	$ 6,539.62	84.06	$ 5,497.20	15.94	*$1,042.42		
‡Locomotives leased to other Passengers	1,309.59		1,097.44				1,097.44		
Freight	5,756.97		*4,792.68		4,792.68				
Work	286.29		217.97	59.23	129.10	40.77	† 88.87		
Various	452.43		421.81		406.56		15.25		
Total Locomotives	$15,515.28		$13,069.52		$10,825.54		$2,243.98		
Passenger Cars	394.38		323.53				323.53		
Work Equipment	1,376.18		1,128.65	59.23	668.51	40.77	460.14	Intrastate	
Total Received	$17,285.84		$14,521.70		$11,494.05		$3,027.65	70.6%	$2,138
Rent Paid for Hire of Equipment:									
For Freight Train Cars (Balance)	$21,824.62		$17,902.90		$17,902.90				
Locomotives	3,473.70		2,849.48		2,844.83		4.65		
Passenger Train Cars	702.31		576.15				576.15		
Sleepers	1,357.42		1,113.45				1,113.45		
Work Equipment	2.31		1.89	59.23	1.12		.77	Intrastate	
Total Paid	$27,360.56		$22,443.87		$20,748.85		$1,695.02	70.6%	$1,197

Operating Expenses Acct. 326:
Mich. ..... $5,526—100%
Mich. Pass. ..... 2,253—40.77%

*On basis of use by the D. S. S. & A. Ry.
†On the basis of Repair of Work Equipment to Passenger and Freight.
‡On basis of mileage of individual locomotives.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Rents Received (Joint Facilities)—Year Ending June 30th, 1916.

MICHIGAN.

Main Line—Michigamme to Beaufort Jct., used by C. & N. W. Ry. freight trains	$ 2,150.98	Common
Main Line—Ishpeming to Marquette, used by C. & N. W. Passenger Trains	1,050.02	Passenger
Main Line—Negaunee to Calumet, used by C. & N. W. Ry. Passenger Trains	6,546.82	Passenger
Main Line—Champion to Calumet, used by C. M. & St. P. Ry. passenger trains	4,117.50	Passenger
Main Line—Houghton to Pilgrim, used by Mineral Range R. R. Freight Trains	3,457.77	Common
Mine Yard Tracks—Ishpeming, used by switch engines of L. S. & I. Ry	1,208.88	Freight
Land, Negaunee—Occupied by Union Depot (Passenger)	150.00	Passenger
Union Depot Tracks—Negaunee, used by C. & N. W. Ry. Co	57.00	Common
Enginehouse—Houghton, used by Mineral Range R. R. Co	212.00	Freight
Yard Tracks—Marquette, used by M. M. & S. E. Ry. Co	220.00	Freight
	19,170.97	

SUMMARY.

		Freight	Pass.
		1,640.88	11,864.34
$5,665.78 Common assigned	Rev. Basis Frt. 69.69% Pass. 30.31%	3,948.46	1,717.29
		*5,589.34	13,581.63
*Passenger, $13,582		Intra 70.6%	$ 9,599
		Inter 29.4%	3,983

Apportionment of Miscellaneous Rents Paid—Year Ending June 30th, 1916.

	Total	Freight	Passenger
Rent of land for freight sidings at Houghton, Mich.	34.00	34.00	
Rent of land for freight sidings at Negaunee, Mich.	3.00	3.00	
	37.00	37.00	

COMPLAINANT'S EXHIBIT 204

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Rents Paid (Joint Facilities)—Year Ending June 30th, 1916.

MICHIGAN.	Total	Freight	Passenger
Sault Ste. Marie Bridge Co. (International Bridge):			
Bond Interest, Sinking Fund and Taxes are paid by the D. S. S. & A. Ry. Co., C. P. Ry. Co. and "Soo Line" on basis of revenue (Frt. and Pass.), earned by each on traffic that passes over the Bridge:			
D. S. S. & A. Ry. Pro	3,247.84	2,908.06	339.78(1)
Sault Ste. Marie Switching Account:			
Yard at Sault Ste. Marie, Mich	2,580.93	2,580.93	
Sainte Marie Union Depot Co. at Sault Ste. Marie, Mich.—Proportion of Hire of Equipment and Taxes	1,509.59	402.16	1,107.43(2)
Mineral Range R. R. Co., Trackage Main Line between Houghton and Calumet—D. S. S. & A passenger trains	255.16		255.16
Mineral Range R. R. Co.—Yard Tracks at Houghton	2,064.88	2,064.88	
C. & N. W. Ry. Co.—Yard Tracks at Negaunee	253.47	253.47	
L. S. & I. Ry. Co.—Yard tracks at Negaunee	434.52	434.52	
Mineral Range R. R. Co.—Roundhouse at Calumet (Passenger engines only)	263.20		263.20
	10,609.59	8,644.02	1,965.57

Basis of division between Freight and Passenger:

(1) On relation of D. S. S. & A. freight revenue and passenger revenue to D. S. S. & A. total revenue on traffic passing over the Bridge.

(2) Rental of equipment allocated according to service. Taxes on relation of cost of passenger and freight portion of the property to total cost.

Assignment to Intrastate and Interstate:

			Intrastate	Interstate
(1) $ 339.78	All Interstate			339.78
1,625.79	70.6%	Intra	1,147.81	
	29.4%	Inter		477.98
			1,147.81	817.76

Complainant's Exhibit—Delf.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

In Michigan—Estimated Loss by Application of Act 276.

Year 1916	Intrastate	Interstate	Total
Amount that could be obtained under a Two Cent Rate, except on fares of five miles or less, and certain fares via Negaunee and Champion, included herein, on which more than two cents could be obtained, as shown below:			
Adults, 2c. per mile	$ 412,090	$ 169,014	$ 581,104
Children, 1c. per mile	4,119	2,149	6,268
	$ 416,209	$ 171,163	$ 587,372
Add:			
Amount in excess of 2c. per mile that could be obtained from fares of five miles or less	1,959		1,959
Amount in excess of 2c. per mile that could be obtained on certain business via Negaunee and Champion	123	4,660	4,783
Total	$ 418,291	$ 175,823	$ 594,114
Amount that was received under Three Cent Rate	544,181	226,574	770,755
Loss, 1916	$ 125,890	$ 50,751	$ 176,641

COMPLAINANT'S EXHIBIT 204

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Special Service Train Revenue, Entire Line—Year ended June 30th, 1916.

		Entire Line		Michigan		Mich. Intrastate	
		Frt.	Pass.	Frt.	Pass.	Frt.	Pass.
1915		6 cars	3 cars				
July	Sun Bros. Circus	766.67	383.33	580.66	290.33	566.67	283.33
		5 cars	2 cars				
Sept.	Hendershot United Shows	214.29	85.71	214.29	85.71	214.29	85.71
Sept.	H. C. Pierce		51.00				
Oct.	Mutt & Jeff Opera Co		96.43		96.43		96.43
Nov.	C. & N. W. Ry		50.00		50.00		50.00
Nov.	Pickands Mather & Co		208.31				
1916							
Jan.	C. & N. W. Ry		50.00		50.00		50.00
	C. & H. Mining Co		142.50		142.50		142.50
		12 cars	6 cars				
June	Cole Bros. Circus	774.67	387.33	774.67	387.33	774.67	387.33
		8 cars	5 cars				
	Orton Bros. Circus	615.40	384.60	360.00	225.00	338.47	211.53
		6 cars	4 cars				
	J. M. Eschman World Shows	631.80	421.20	427.26	284.83	408.60	272.40
		3,002.83	2,260.41	2,356.88	1,612.13	2,302.70	1,579.23

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Freight Statistics—Year ending June 30th, 1916.

MICHIGAN.

	Net Tons	Tons One Mile	Revenue
Freight other than Interstate Iron Ore	2,272,992	230,153,824	1,818,168.19
Iron Ore to Marquette Dock—All Interstate	1,089,395	15,034,506	249,390.55
Total Michigan Freight	3,362,387	245,188,330	2,067,558.74
Michigan Intrastate Freight	**Net Tons**	**Tons One Mile**	**Revenue**
	1,111,137	84,579,327	751,968.54
Percent of Freight other than Iron Ore	48.88	36.75	41.36
Percent of Total Michigan Freight	33.05	34.50	36.37
Michigan Interstate Freight	**Net Tons**	**Tons One Mile**	**Revenue**
Freight other than Iron Ore	1,161,855	145,574,497	1,066,199.65
Percent of Freight other than Iron Ore	51.12	63.25	58.64
Iron Ore to Marquette Docks	1,089,395	15,034,506	249,390.55
	2,251,250	160,609,003	1,315,590.20
Percent of Total Michigan Freight	66.95	65.50	63.63

Freight other than Iron Ore—Michigan:
- Rate per ton per mile ..... .00789
- Average rate per ton ..... .79990
- Average distance hauled ..... 101.25 mi.

Total Freight—Michigan:
- Rate per ton per mile ..... .00838
- Average rate per ton ..... .61490
- Average distance hauled ..... 73.35 mi.

Iron Ore to Docks—Michigan:
- Rate per ton per mile ..... .01513
- Average rate per ton ..... .22892
- Average distance hauled ..... 15.13 mi.

All Michigan Intrastate Freight:
- Rate per ton per mile ..... .00889
- Average rate per ton ..... .67675
- Average distance hauled ..... 76.11 mi.

Michigan Interstate Freight other than Iron Ore:
- Rate per ton per mile ..... .00732
- Average rate per ton ..... .91767
- Average distance hauled ..... 125.20 mi.

All Michigan Interstate Freight:
- Rate per ton per mile ..... .00843
- Average rate per ton ..... .58438
- Average distance hauled ..... 72.92 mi.

ENTIRE LINE.

Number of Net Tons carried	Freight	2,272,992
Number of Net Tons carried	Iron Ore to Docks	1,089,395
Number of Net Tons carried	All Freight	3,362,387
Number of Net Tons carried One Mile	Freight	265,008,271
Number of Net Tons carried One Mile	Iron Ore to Docks	15,034,506
Number of Net Tons carried One Mile	All Freight	280,040,777

Average Net Ton haul ..... 80.75 miles
Rate per Ton per mile ..... .00827

COMPLAINANT'S EXHIBIT 204

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statistics of Travel in Michigan in D. S. S. & A. Sleeping Cars—Year Ended June 30th, 1916.

	Passenger Miles in Sleeping Cars Michigan	Intrastate Pass. Miles in Sleeping Cars Michigan	Sleeping Car Revenue Michigan	Intrastate Sleeping Car Revenue Michigan	Number of Pass. in Sleeping Cars Michigan Total	Number Intrastate
1915						
July	573,579	154,411	3,306.74	1,178.66	2,423	971
August	589,994	158,337	3,396.51	1,236.50	2,538	1,000
September	514,316	128,658	3,177.69	964.35	2,218	751
October	423,241	99,490	2,432.43	908.90	2,001	719
November	353,298	73,143	2,292.89	623.70	1,624	517
December	371,319	72,716	2,061.87	619.35	1,630	476
1916						
January	331,632	73,326	1,827.49	589.50	1,466	450
February	282,315	58,585	1,676.51	465.75	1,304	392
March	312,232	61,045	1,983.76	570.81	1,427	418
April	251,566	63,818	2,227.48	601.60	1,602	493
May	292,825	97,171	2,582.40	871.90	1,828	693
June	456,721	164,028	3,342.69	1,211.10	2,487	959
Total Fiscal Year, 1916	4,753,038 16.01% of Total Mich. Pass. 1 Mile	1,204,728 25.34% of Mich. Sleeping Car Pass. 1 Mile	30,390.46	9,842.12 32.39% of Mich. Sleeping Car Revenue	22,548	7,848 30.32% of Total Sleeping Car Pass.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statistics of Travel in Michigan in Foreign Sleeping Cars—Year Ending June 30th, 1916.

Month	Total Pass. Miles in Sleeping Cars in Michigan	Intrastate Pass. Miles in Sleeping Cars in Michigan	Intrastate Sleeping Car Revenue Michigan	No. of Passgrs. in Sleeping Cars Michigan. Total	Intrastate
1915					
July	118,721	55,744		2,320	842
August	160,669	78,912		2,972	1,185
September	151,943	74,903		2,722	1,091
October	119,645	65,952		2,068	963
November	98,218	55,785		1,824	879
December	118,636	67,180		2,015	992
1916					
January	102,989	52,679		1,818	782
February	76,193	38,357		1,374	606
March	73,334	36,904		1,333	561
April	94,385	51,057		1,577	747
May	105,603	68,508		1,823	985
June	150,463	69,381		2,511	983
	1,370,799—100%	715,452—52.19%		24,357—100%	10,616—43.58%

COMPLAINANT'S EXHIBIT 208

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Mileage Owned.

FROM	TO	July, 1916, to Dec., 1916, incl.		Jan., 1917, to June, 1917, incl.	
		Entire Line	Mich.	Entire Line	Mich.
Main Lines:					
S. S. Marie, Mich.	Superior, Wis.	409.58	302.43	409.58	302.43
Soo Junction, Mich.	St. Ignace, Mich.	42.97	42.97	42.97	42.97
Marquette, Mich.	Winthrop Jct., Mich.	17.33	17.33	17.33	17.33
Nestoria, Mich.	Houghton, Mich.	48.20	48.20	48.20	48.20
Humboldt, Mich.	Republic, Mich.	8.76	8.76	8.76	8.76
Branches:					
	C. & N. W. Conn.:				
Negaunee, Mich.	Volunteer Mine, Mich.	5.03	5.03	5.03	5.03
Bessemer Jct., Mich.	Bessemer, Mich.	2.03	2.03	2.03	2.03
Spurs for traffic purposes		66.87	65.50	66.87	65.50
Total		600.77	492.25	600.77	492.25
Percent		100.00	81.94	100.00	81.94

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Revenue Locomotive Miles.

ENTIRE LINE.

	July, 1916, to Dec., 1916, incl.		Jan., 1917, to June, 1917, incl.		Year Ending June 30, 1917	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Freight Loco. Miles	507,664	424,441	608,233	503,261	1,115,897	927,702
Passenger Loco. Miles	476,086	394,444	465,667	386,148	941,753	780,592
Mixed Loco. Miles	8,601	8,601	8,471	8,471	17,072	17,072
Special Service Loco. Miles	1,088	1,028	1,029	840	2,117	1,868
Train Switching Loco. Miles	79,581	69,855	89,677	77,849	169,258	147,704
Yard Switching Loco Miles	176,200	169,192	150,864	140,634	327,064	309,826
	1,249,220	1,067,561	1,323,941	1,117,203	2,573,161	2,184,764
Mileage of D. S. S. & A. Locomotives on M. R. R. R.:						
Freight Loco Miles	345	345	1,487	1,487	1,832	1,832
Passenger Loco. Miles	21,798	21,798	21,496	21,496	43,294	43,294
Special Service Loco. Miles			29	29	29	29
Total	1,271,363	1,089,704	1,346,953	1,140,215	2,618,316	2,229,919
Percent	100.00	85.71	100.00	84.65	100.00	85.17

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Freight Locomotive Mileage.

ENTIRE LINE.

	July, 1916, to Dec., 1916, incl.		Jan., 1917, to June, 1917, incl.		Year Ending June 30, 1917	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Freight Loco. Miles	507,664	424,441	608,233	503,261	1,115,897	927,702
Frt. Train Switching Loco. Miles	78,471	68,745	88,573	76,745	167,044	145,490
Total	586,135	493,186	696,806	580,006	1,282,941	1,073,192
Mixed Loco. Miles (including Spl. Service Mixed)	8,224	8,224	7,511	7,468	15,735	15,692
Total	594,359	501,410	704,317	587,474	1,298,676	1,088,884
Percent	100.00	84.36	100.00	83.41	100.00	83.85
Mileage of D. S. S. & A. Locomotives on M. R. R. R.:						
Freight Loco. Miles	345	345	1,487	1,487	1,832	1,832
Mixed (Spl. Service) (83.12%)			24	24	24	24
Total	594,704	501,755	705,828	588,985	1,300,532	1,090,740
Percent	100.00	84.37	100.00	83.45	100.00	83.87

COMPLAINANT'S EXHIBIT 206

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Passenger Locomotive Mileage.

ENTIRE LINE.

	July, 1916, to Dec., 1916, inc.		Jan., 1917, to June, 1917, inc.		Year Ending June 30th, 1917.	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Passenger Loco. Miles	476,086	394,444	465,667	386,148	941,753	780,592
Pass. Train Switching Loco. Miles	1,110	1,110	1,104	1,104	2,214	2,214
Spl. Service Loco. Miles (Pass.)	159	99	451	326	610	425
Total	477,355	395,653	467,222	387,578	944,577	783,231
Percent	100.00	82.88	100.00	82.95	100.00	82.92
Mixed Loco. Miles (including Spl. Service Mixed)	1,306	1,306	1,538	1,517	2,844	2,823
Total	478,661	396,959	468,760	389,095	947,421	786,054
Percent	100.00	82.93	100.00	83.01	100.00	82.97
Mileage of D. S. S. & A. Locomotives on M. R. R. R. Passenger Loco. Miles	21,798	21,798	21,496	21,496	43,294	43,294
Mixed (Spl. Service) (16.68%)			5	5	5	5
Total	500,459	418,757	490,261	410,596	990,720	829,353
Percent	100.00	83.67	100.00	83.75	100.00	83.71

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Mixed Locomotive Mileage.

ENTIRE LINE.

	July, 1916, to Dec., 1916, inc.		
	Mich.	Wis.	Total
Mixed Locomotive Miles	8,601		8,601
Mixed Spl. Service Loco. Miles	929		929
Total	9,530		9,530
Percent	100.00		100.00

Divided between freight and passenger service on basis of mileage of cars in mixed trains.

Car Miles	Frt.	Pass.			
Mich. Frt., 136,562—86.30% of 9,530	8,224				
Mich. Pass., 21,679—13.70% of 9,530		1,306			
Wis. None.					
	8,224	1,306			9,530

	Jan., 1917, to June, 1917, inc.		
Mixed Locomotive Miles	8,471		8,471
Mixed Spl. Service Loco. Miles	514	64	578
Total	8,985	64	9,049
Percent	99.29	.71	100.00

Car Miles	Frt.	Pass.	Frt.	Pass.	
Mich. Frt., 94,638—83.12% of 8,985	7,468				
Mich. Pass. 19,227—16.88% of 8,985		1,517			
Wis. Frt. 1,300—66.67% of 64			43		
Wis. Pass. 650—33.33% of 64				21	
	7,468	1,517	43	21	9,049

COMPLAINANT'S EXHIBIT 206

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Passenger Proportion of Michigan Revenue Locomotive Mileage

Year Ending June 30th, 1917.

MICHIGAN.

	Total Mich. Revenue Locomotive Mileage		Passenger Pro. of Michigan Revenue Loco. Mileage
Freight Loco. Miles	927,702		
Passenger Loco. Miles	780,592		780,592
Mixed Loco. Miles	17,072		2,823
Special Service Loco. Miles (Mixed)	1,443		
Special Service Loco. Miles (Pass.)	425		425
Train Switching Loco. Miles	147,704		2,214
Yard Switching Loco. Miles	309,826	2.47%	7,665
Total	2,184,764		793,719
Mileage of D. S. S. & A. Locomotives on M. R. R. R. Freight Loco. Miles	1,832		
Passenger Loco. Miles	43,294		43,294
Mixed (Spl. Service)	29		5
Total	2,229,919		837,018
Percent	100.00		37.87%

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Revenue Train Mileage.

ENTIRE LINE

	July, 1916 to Dec., 1916, inc.		Mar., 1917 to June, 1917, inc.		Year ending June 30th, 1917	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Freight Train Miles	461,778	380,741	539,719	439,988	1,001,497	820,729
Passenger Train Miles*	459,889	379,797	446,819	368,927	906,708	748,724
Mixed Train Miles	8,601	8,601	8,409	8,409	17,010	17,010
Special Service Train Miles	971	911	802	622	1,773	1,533
Total*	931,239	770,050	995,749	817,946	1,926,988	1,587,996
Percent	100.00	82.69	100.00	82.14	100.00	82.41

*The mileage of C. & N. W. trains Nos. 110 and 111 between Ishpeming and Marquette and of C. M. & St. P. Trains Nos. 105 and 106 between Milwaukee Jct., Champion and Marquette not included.

Statement of Freight Train Mileage including proportion of Mixed and Special Service Train Miles.

ENTIRE LINE

	July, 1916 to Dec., 1916, inc.		Jan., 1917 to June, 1917, inc.		Year ending June 30th, 1917	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Freight Train Miles	461,778	380,741	539,719	439,988	1,001,497	820,729
Mixed Train Miles	8,124	8,124	7,383	7,340	15,507	15,464
(Including Spl. Service Mixed)						
Total	469,902	388,865	547,102	447,328	1,017,004	836,193
Percent	100.00	82.74	100.00	81.76	100.00	82.21

COMPLAINANT'S EXHIBIT 206

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Passenger Train Mileage, including proportion of Mixed and Special Service Train Miles

ENTIRE LINE

	July, 1916 to Dec., 1916 inc.		Jan., 1917 to June, 1917, inc.		Year Ending June 30, 1917	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	
Passenger Train Miles*	450,889	379,797	446,819	368,927	906,708	748,724
Spl. Service Train Miles (Pass)..	158	98	316	200	474	298
Mixed Train Miles (Including SPL. Service Mixed)	1,290	1,290	1,512	1,491	2,802	2,781
Total	461,337	381,185	448,647	370,618	909,984	751,803
Percent	100.00	82.63	100.00	82.61	100.00	82.62

*The mileage of C. & N. W. trains Nos. 110 & 111 between Ishpeming and Marquette and of C. M. & St. P. trains Nos. 105 and 106 between Milwaukee Jct., Champion and Marquette not included.

Statement of Passenger Proportion of Michigan Revenue Train Mileage

Year Ending June 30th, 1917

MICHIGAN

	Total Mich. Revenue Train Mileage	Passenger Pro. of Mich. Revenue Train Mileage
Freight Train Mileage	820,729	
Passenger Train Mileage	748,724	748,724
Spl. Service Train Mileage (Pass.)	298	298
Mixed Train Mileage	18,245	2,781
Total	1,587,996	751,803
Percent	100.00	47.34
Mileage of CM&StP Trains Nos. 105 and 106 over DSS&A Tracks	21,284	21,284
Mileage of C&NW trains Nos. 110 and 111 over DSS&A tracks	11,315	11,315
Total	1,620,595	784,402
Percent	100.00	48.40%

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Mixed Train Miles.

ENTIRE LINE.

July, 1916, to Dec., 1916, inc.

	Mich.	Wis.	Total
Mixed Train Mileage	8,601		8,601
Mixed Spl. Service Train Miles	813		813
Total	9,414		9,414
Percent	100.00		100.00

Divided between freight and passenger service on basis of mileage of cars in mixed trains.

Car Miles	Frt.	Pass.			
Mich.—Frt. 136,562—86.30% of 9,414	8,124				
Mich.—Pass. 21,679—13.70% of 9,414		1,290			
Wis.—None.					
	8,124	1,290			9,414

Jan., 1917, to June, 1917, inc.

Mixed Train Miles	8,409				8,409
Mixed Spl. Service Train Miles	422		64		486
Total	8,831		64		8,895
Percent	99.28		.72		100.00

Car Miles	Frt.	Pass.	Frt.	Pass.	
Mich.—Frt. 94,658—83.12% of 8,831	7,340				
Mich.—Pass. 19,227—16.88% of 8,831		1,491			
Wis.—Frt. 1,300—66.67% of 64			43		
Wis.—Pass. 650—33.33% of 64				21	
	7,340	1,491	43	21	8,895

COMPLAINANT'S EXHIBIT 205

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Passenger Car Mileage.

ENTIRE LINE.

	July, 1916, to Dec., 1916, inc.		Jan., 1917, to June, 1917, inc.		Year ending June 30th, 1917	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Passenger Car Miles:						
Passenger Cars	1,070,880	904,674	983,660	837,241	2,054,540	1,741,915
Sleep'g Car and Obs. Cars—Foreign	106,431	106,244	100,754	100,616	207,185	206,860
S. P. & O. Cars—D. S. S. & A. Sleepers	350,359	264,702	333,166	251,408	683,525	516,110
S. P. & O. Cars—D. S. S. & A. Obs. Cars	90,657	90,657	86,945	86,945	177,602	177,602
Dining Cars—D. S. S. & A.	86,089	57,232	86,349	58,129	172,438	115,361
Dining Cars—Foreign	24,931	24,931	24,002	24,002	48,933	48,933
Other Pass. Train Cars	519,829	438,511	497,403	421,142	1,017,232	859,653
Mixed Train Car Miles:						
Passenger Cars	17,866	17,866	17,202	17,202	35,068	35,068
Special Train Car Miles:						
Passenger Cars	3,971	3,911	316	200	4,287	4,111
Sleep'g, Parlor and Obs. Cars	98	98	3,258	2,376	3,356	2,474
Dining Cars			88	49	88	49
Other Pass. Train Cars			534	302	534	302
Total	2,271,111	1,908,826	2,133,677	1,799,612	4,404,788	3,708,438
Percent	100.00	84.05	100.00	84.34	100.00	84.19

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of D. S. S. & A. Sleeping and Dining Car Mileage, including mileage on Mineral Range R. R.

ENTIRE LINE.

	July, 1916, to Dec., 1916, inc.		Jan., 1917, to June, 1917, inc.		Year ending June 30th, 1917	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Sleeping Cars	360,833	275,176	342,888	261,130	703,721	536,306
Percent	100.00	76.26	100.00	76.16	100.00	76.21
Dining Cars	86,089	57,232	86,349	58,129	172,438	115,361
Observation Cars	95,795	95,795	91,691	91,691	187,486	187,486
Total	181,884	153,027	178,040	149,820	359,924	302,847
Percent	100.00	84.13	100.00	84.15	100.00	84.14

COMPLAINANT'S EXHIBIT 205

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of Freight Car Mileage.

ENTIRE LINE.

	July, 1916, to Dec., 1916, incl.		Jan., 1917, to June, 1917, incl.		Year Ending June 30, 1917	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Freight Train Car Miles:						
Loaded	6,748,104	5,817,708	7,328,827	6,094,288	14,076,931	11,911,996
Empty	2,445,985	2,144,444	2,506,923	2,101,830	4,952,908	4,246,274
Caboose	455,978	375,009	533,597	434,725	989,575	809,734
Mixed Train Car Miles:						
Freight—Loaded	59,031	59,031	49,830	49,830	108,861	108,861
Freight—Empty	65,935	65,935	40,763	40,763	106,698	106,698
Special Train Car Miles:						
Freight—Loaded	10,840	10,840	4,815	3,645	15,655	14,485
Freight—Caboose	756	756	550	420	1,306	1,176
Total	9,786,629	8,473,723	10,465,305	8,725,501	20,251,934	17,199,224
Percent	100.00	86.58	100.00	83.37	100.00	84.93

Statement of Non-Revenue Car Miles.

ENTIRE LINE.

	July, 1916, to Dec., 1916, incl.		Jan., 1917, to June, 1917, incl.		Year Ending June 30, 1917	
	Entire Line	Mich.	Entire Line	Mich.	Entire Line	Mich.
Non-Revenue Car Miles	251,133	219,574	80,988	49,616	332,121	269,190
Percent	100.00	87.43	100.00	61.26	100.00	81.05

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Revenues.

Year Ending June 30th, 1917.

	Entire Line	Michigan	
Freight Revenue	$2,741,033.27	$2,415,801.69	
Switching Revenue	21,330.42	13,400.48	
Special Service Train Revenue	3,180.24	3,077.04	
Other Freight Train Revenue	43.00	40.06	
Storage—Freight	2,925.02	2,813.21	
Demurrage	14,743.00	12,344.00	
Miscellaneous (Dockage and Handling Iron Ore)	44,473.79	44,473.79	
Total Freight Revenue	$2,827,728.74	$2,491,950.27	70.46%
Passenger Service Train Revenue	1,131,358.22	970,783.78	
Sleeping Car Revenue	44,106.51	34,147.80	
Parlor and Chair Car Revenue	4,706.45	4,706.45	
Dining and Buffet Revenue	40,042.85	31,865.25	
Special Service Train	2,522.76	2,173.73	
Station, Train and Boat Privileges	600.00	495.46	
Parcel Room Revenue	463.50	463.50	
Storage—Baggage	164.55	164.05	
Total Passenger Revenue	$1,223,964.84	$1,044,800.02	29.54%
Telegraph Service Revenue	816.88	766.62	
Rents of Buildings and other Property	7,709.58	7,642.73	
Miscellaneous	5,771.03	5,624.39	
Total	$14,297.49	$14,033.74	
Joint Facility Revenue—Cr	8,704.39	2,515.65	
Joint Facility Revenue—Dr	2.62	2.62	
Total	$8,701.77	$2,513.03	
Total Operating Revenue	$4,074,692.84	$3,553,297.06	

COMPLAINANT'S EXHIBIT 206

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Operating Revenues—Year Ending June 30th, 1917.

MICHIGAN.

	Total	Assigned to Freight	Passenger		Intrastate	Interstate
Freight Revenue	2,415,801.69	2,415,801.69				
Switching Revenue	13,400.48	13,400.48				
Special Service Train Revenue	3,077.04	3,077.04				
Other Freight Train Revenue	40.06	40.06				
Storage—Freight	2,813.21	2,813.21				
Demurrage	12,344.00	12,344.00				
Miscl. (Dockage and Handling Iron Ore)	44,473.79	44,473.79				
		2,491,950.27 70.46%				
Passenger Service Train Revenue	970,783.78		970,783.78	Located	678,393.51	292,390.27
Sleeping Car Revenue	34,147.80		34,147.80	Located	12,712.09	21,435.71
Parlor and Chair Car Revenue	4,706.45		4,706.45	—69.87%	3,288.40	1,418.05
Dining and Buffet Car Revenue	31,865.25		31,865.25	—69.87%	22,264.25	9,601.00
Special Service Train Revenue	2,173.73		2,173.73	Located	1,680.96	492.77
Station, Train and Boat Privileges	495.46		495.46	—69.87%	346.18	149.28
Parcel Room Revenue	463.50		463.50	—69.87%	323.85	139.65
Storage—Baggage	164.05		164.05	—69.87%	114.62	49.43
	3,536,750.20 100%		1,044,800.02	29.54%	719,123.86	325,676.16
Telegraph Service Revenue	766.62	540.16	226.46	—69.87%	158.23	68.23
Rents of Buildings and Other Property	7,642.73*	6,039.61	488.62	—69.87%	341.40	147.22
Miscel. (Other than Dockage, etc., on Ore)	5,624.39	5,036.08	588.31	—69.87%	411.05	177.26
Joint Facility Revenue (Balance)	2,513.03	1,482.36	1,030.67		670.17	360.50
	16,546.77					
Total Operating Revenue	$3,553,297.06	$2,505,048.48	$1,047,134.08		$720,704.71	$326,429.37

*$1,114.50 of the $7,642.72 is from property not in inventory and that amount is excluded from the assignments to Freight and Passenger.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Rents Paid—(Joint Facilities).

Year Ending June 30th, 1917.

	Total	Freight	Passenger
Sault Ste. Marie Bridge Co. (International Bridge)—Bond Interest, Sinking Fund and Taxes are paid by the D. S. S. & A. Ry. Co., C. P. Ry. Co. and "Soo" Line on basis of revenue (Freight and Passenger) earned by each on traffic that passes over the bridge D. S. S. & A. Ry. Pro	4,523.31	4,111.90	411.41①
Sault Bridge Switching Account—Yard at Sault Ste. Marie, Mich	2,375.24	2,375.24	
Sainte Marie Union Depot Co., at Sault Ste. Marie, Mich.—Proportion of Hire of Equipment and Taxes	1,316.93	328.90	988.03②
Mineral Range R. R. Co.—Yard Tracks at Houghton	2,332.33	2,332.33	
C. & N. W. Ry. Co.—Yard Tracks at Negaunee	579.36	579.36	
L. S. & I. Ry. Co.—Yard Tracks at Negaunee	362.10	362.10	
Mineral Range R. R. Co.—Roundhouse at Calumet (Pass. engines only)	265.60		265.60
	11,754.87	10,089.83	1,665.04

Basis of division between Freight and Passenger:

①On relation of D. S. S. & A. Freight Revenue and Passenger Revenue to D. S. S. & A. total Revenue on traffic passing over the Bridge.

②Rental of equipment allocated according to service—Taxes on relation of cost of passenger and freight portion of the property to total cost.

	Intrastate	Interstate
Passenger Located		$411.41
1,253.63—Intra. 69.87	$875.91	
—Inter. 30.13		377.72
	$875.91	$789.13

COMPLAINANT'S EXHIBIT 206

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Year Ending June 30th, 1917.

MICHIGAN.

	Number of Passengers	Passengers One Mile	Average Haul	Rate per Passenger Per Mile
Total Michigan	754,515 100%	33,436,338 100%	44.32	.02654
INTRASTATE.				
Michigan	669,363 88.71%	23,630,061 70.67%	35.30	.02624
INTERSTATE.				
Michigan	85,152 11.29%	9,806,277 29.33%	115.16	.02726
ENTIRE LINE.	820,022	39,450,131	48.11	.02618

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Year Ending June 30th, 1917.

ENTIRE LINE.

Operating Revenue	$4,074,692.84	
Operating Expenses	3,055,980.60	$1,018,712.24
Railway Tax Accruals	191,290.16	
Uncollectible Railway Revenue	43.01	191,333.17
Railway Operating Income		$827,379.07
Other Income:		
Rent from Locomotives	14,288.19	
Rent from Passenger Train Cars	306.02	
Rent from Work Equipment	1,507.43	
Joint Facility Rent Income	18,345.63	
Miscellaneous Rent Income	256.33	
Miscellaneous Non-Operating Physical Property	5,014.12	
Income from Funded Securities	4,592.51	
Income from Unfunded Securities and Accounts	17,966.78	
Income from Sinking and Other Reserve Funds	521.54	
Miscellaneous Income	19.21	62,817.76
Gross Income		$890,196.83
Deduction from Gross Income:		
Hire of Freight Cars (Balance)	100,845.82	
Rent for Locomotives	6,034.10	
Rent for Passenger Train Cars	2,019.90	
Joint Facility Rents	41,328.46	
Miscellaneous Rents	175.15	
Miscellaneous Tax Accruals	922.93	
Separately Operated Properties	27,520.42	
Miscellaneous Interest	15.96	
Miscellaneous Income Charges	733.00	
Total Deductions (Interest on Funded Debt not included)		179,595.74
		$710,601.09

Estimated loss by application of Act 276.

COMPLAINANT'S EXHIBIT 205

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

IN MICHIGAN.

Estimated Loss by Application of Act 276.

YEAR 1917	Intrastate	Interstate	Total
Amount that could be obtained under a Two Cent Rate, except on fares of five miles or less and certain fares via Negaunee and Champion included herein, on which more than two cents could be obtained, as shown below:			
Adults, 2 cents per mile	$463,338	$192,281	$655,619
Children, 1 cent per mile	4,631	1,922	6,553
	$467,969	$194,203	$662,172
Add:			
Amount in excess of 2 cents per mile that could be obtained from fares of five miles or less	2,232		2,232
Amount in excess of 2 cents per mile that could be obtained on certain business via Negaunee and Champion	123	4,660	4,783
Total	$470,324	$198,863	$669,187
Amount that was received under Three Cent Rate	$320,072	$267,349	$587,421
Loss, 1917	$149,748	$ 68,486	$218,234

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Details of Rents Received (Joint Facilities).

Year Ending June 30th, 1917.

MICHIGAN.

Main Line—Michigamme to Beaufort Jct., used by C. & N. W. Ry. freight trains	$1,200.27	Common
Main Line—Ishpeming to Marquette, used by C. & N. W. Ry. passenger trains	1,047.14	Pass.
Main Line—Negaunee to Calumet, used by C. & N. W. Ry. passenger trains	6,528.94	Pass.
Main Line—Champion to Calumet, used by C. M. & St. P. Ry. passenger trains	4,106.25	Pass.
Main Line—Houghton to Pilgrim, used by Mineral Range R. R. freight trains	3,252.16	Common
Mine Yard Tracks—Ishpeming, used by switch engines of L. S. & I. Ry	1,208.88	Freight
Land—Negaunee, occupied by Union Depot (Passenger)	150.00	Pass.
Union Depot Tracks—Negaunee, used by C. & N. W. Ry. Co	57.00	Common
Enginehouse—Houghton, used by Mineral Range R. R. Co	268.40	Freight
Yard Tracks—Marquette, used by M. M. & S. E. Ry. Co	160.00	Freight
	$17,979.04	

SUMMARY.

	Pass.	Frt.
Directly assigned	$11,832.33	$1,637.28
4,509.43 Com.—Pass. 29.54% Rev. basis	1,332.09	
Frt. 70.46% Rev. basis		3.177.34
	$13,164.42	$4,814.62

Pass. 13,164.42—Intra. 69.87%	$9,197.98	
Inter. 30.12%	3.966.44	
	$13,164.42	

Apportionment of Miscellaneous Rents Paid.

Year Ending June 30th, 1917.

MICHIGAN.

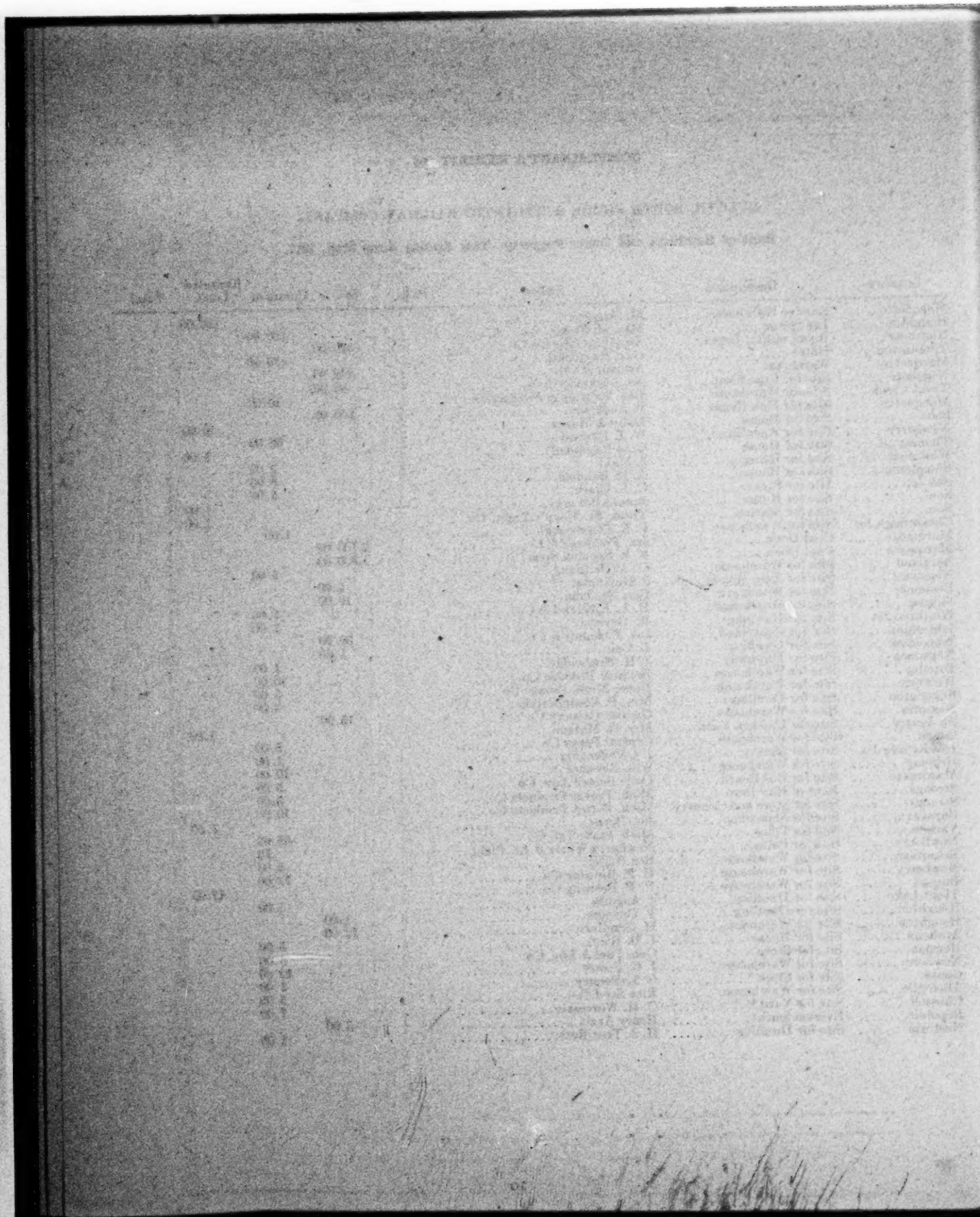
	Total	Freight	Passenger
Rent of land for freight sidings:			
At Houghton, Mich	60.00	60.00	
At Negaunee, Mich	3.00	3.00	
At Marquette, Mich	105.00	105.00	
	$168.00	$168.00	

COMPLAINANT'S EXHIBIT 205

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Rent of Buildings and Other Property—Year Ending June 30th, 1917.

Location	Description	Lessee	Pass.	Frt.	Common	Excluded Land	Total
Marquette	Site for Warehouse	M. Sweder				120.00	
Houghton	Lee House	Mrs. M. Stone			120.00		
Negaunee	Room in Frt. Depot	American Express Co		300.00			
Thomaston	Hotel	Gust Raymond			420.00		
Marquette	Warehouse	Armour & Co		240.00			
Negaunee	Site for Coal Shed	Jas. Pickands & Co		80.00			
Trout Creek	Site for Warehouse	Dul. Brewing & Malting Co			10.00		
Marquette	Site for Fish House	P. Anderson		100.00			
Soo	Site for House	Kelly & Mayer				10.00	
Newberry	Site for Warehouse	W. I. Everest			60.00		
Thomaston	Site for House	Gust Raymond				1.00	
Whitefish	Site for House	J. Maki			2.00		
Shingleton	Site for House	A. E. Bauman			6.00		
Soo Jct	Site for Store	C. L. Clark			5.00		
Soo	Site for House	Antoni Bokaski				1.00	
Soo	Site for Station	Trans. St. Mary's Tract. Co				1.00	
Chesbrough Jct.	Site for Warehouse	F. E. Chesbrough			1.00		
Marquette	Coal Dock	Jas. Pickands & Co		2,700.00			
Marquette	Coal Dock	F. B. Spear & Sons		1,300.00			
Bergland	Site for Warehouse	G. A. Bergland			5.00		
Negaunee	Site for Auto House	J. Heikkala		5.00			
Bessemer	Site for Woodyard	Geo. St. John		10.00			
Sidnaw	Site for Warehouse	H. L. Kirkland & Co			5.00		
Winthrop Jct	Site for Dwelling	W. Garceau			1.00		
Ishpeming	Site for Coal Shed	Jas. Pickands & Co		30.00			
Ishpeming	Site for Dwelling	L. Cain		1.00			
Negaunee	Site for Driveway	J. H. Sawbridge			1.00		
Brimley	Site for Warehouse	Brimley Produce Co			10.00		
Wetmore	Site for Warehouse	Upper Mich. Potato Co			5.00		
Shingleton	Site for Dwelling	Mrs. F. Chamberlain			3.00		
Nestoria	Site for Warehouse	Gannon Grocery Co		15.00			
St. Ignace	Site for Chicken Yard	Mrs. C. Matson				1.00	
Ozark	Site for Warehouse	Central Paper Co			5.00		
Isle Royale Jct.	Site for Shanty	J. Glendenning			1.00		
Brimley	Site for Warehouse	Wm. Reynard			10.00		
Marquette	Site for Bill Board	Delft Poster Adv. Co			5.00		
Strongs	Rent of Hay Barn	Mich. Forest Products Co			5.00		
Strongs	Site for Store and Granary	Mich. Forest Products Co			10.00		
Baraga	Site for Shoe Shop	Jas. Burns				7.50	
Various	Site for Poles	Mich. State Tel. Co			68.03		
Newberry	Site for Poles	Newberry Water & Lt. Plant			.70		
Eckerman	Site for Warehouse	Ben Butler			5.00		
Newberry	Site for Warehouse	U. P. Brewing Co			12.00		
Baraga	Site for Warehouse	U. P. Brewing Co				12.00	
Trout Lake	Site for Dwelling	J. Anguila			5.00		
Houghton	Site for Dwelling	P. Connors		1.00			
Houghton	Site for Warehouse	H. Gundlach		12.00			
Arnheim	Site for House	J. H. Rice			5.00		
Herman	Site for Store	Con. Fuel & Lbr. Co			5.00		
Newberry	Site for Warehouse	J. C. Foster			12.00		
Onota	Site for Store	O. LaBounty			1.00		
Allenville	Site for Warehouse	Rice Seed Co			5.00		
Chassell	Site for Yard	C. H. Worcester			1.00		
Republic	Evervachment	Henry Arala		5.00			
Nestoria	Site for Dwelling	H. J. Toutillott			1.00		



DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Rent of Buildings and Other Property—Year Ending June 30th, 1917.

Location	Description	Lessee	Pass.	Frt.	Common	Excluded Land	Total
Republic	Coal and Wood Yard	C. Peterson Estate		12.00			
Newberry	Site for Warehouse	A. Gettelman Brg. Co			12.00		
L'Anse	Site for Lumber Yard, etc.	National Pole Co				60.00	
L'Anse	Site for Pasture	Wm. Peterson				5.00	
Ishpeming	Site for Dwelling	P. Gigiere		1.00			
Ishpeming	Site for Dwelling	Jas. McGee		1.00			
Matchwood	Site for Highway	Township of Matchwood			1.00		
Soo	Site for Blacksmith Shop	Northwestern Leather Co		12.00			
L'Anse	Site for Dwelling	P. Brogan				12.00	
Kenton	Site for Warehouse	Kenton Store Co			5.00		
Baraga	Site for Oil Tank	Standard Oil Co			60.00		
St. Ignace	Site for Oil Tank	Standard Oil Co		60.00			
Soo	Site for Mill	Kelly & Mayer				25.00	
Negaunee	Site for Refrigerator	J. Perenchio		10.00			
L'Anse	Site for Garden	J. B. Belanger				5.00	
St. Ignace	Site for Porch	C. H. Stanus			5.00		
Ewen	Site for Warehouse	A. T. O'Rourke			10.00		
Ewen	Site for Warehouse	J. N. Suits			10.00		
Baraga	Site for Garden	J. J. Tribley				1.00	
Sidnaw	Site for Dwelling	J. Swanson			1.00		
L'Anse	Site for Lumber Yard	W. T. Culver				375.00	
Marquette	Site for Bill Board			5.00			
Houghton	Site for Garden	Mary M. Doughan		1.00			
Michigamme	Site for Coal Shed	A. Olson			5.00		
Baraga	Site for Warehouse	A. Gauthier				12.00	
Marquette	Site for Carp Furnace	Pioneer Iron Co			1.00		
Marquette	Site for Oil House	Marquette Gas Light Co		10.00			
Seney	Site for Warehouse	Hargrave Bros			12.00		
Baraga	Site for Warehouse	F. Clish				12.00	
Arnheim	Site for Store	Nettle Bros			5.00		
Brimley	Site for Sidewalk	Village of Brimley			1.00		
Ishpeming	Site for Warehouse	Gately Wiggins Co		25.00			
Champion	Site for Coal Shed	J. L. Cardinal		5.00			
Kenneth	Site for Dwelling	L. Hill			1.00		
Covington	Site for Warehouse	W. H. Oakley		5.00			
St. Ignace	Site for Pasture	J. T. Goulding				1.00	
Marquette	Site for Pasture	J. Schwemin				1.00	
Champion	Site for Sewer	Champ. Land & Gravel Co			1.00		
Marquette	Site for Garden	H. P. Stafford				1.00	
Republic	Site for Wood Yard	L. LaForais		6.00			
Moran	Site for Building	Standard Post & Tie Co			10.00		
Ewen	Site for Warehouse	M. Greenough			10.00		
Ewen	Site for Warehouse	Ewen Livery Co			10.00		
Trout Creek	Site for Warehouse	Trout Creek Mfg. Co			5.00		
Ewen	Site for Warehouse	Standard Oil Co			45.00		
Houghton	Site for Boat Houses	Various		8.00			
Thomaston	Site for Property	Various				15.00	
Soo	Site for Dwellings	Various				60.00	
Marquette	Site for Garden					26.00	
Michigan	Site for Station Rooms				246.00		
Michigan	Site for Thomaston Cottages					350.00	
Champion	Lunch Counter		24.00				
Nestoria	Lunch Counter		12.00				
Soo	Stalls in Round House				263.00		
			$36.00	4,960.00	1,529.73	1,114.50	7,640.23
Add acct. error in assignment to States in Sept., 1916					2.50		2.50
			36.00	4,960.00	1,532.23	1,114.50	7,642.73

Rent of Buildings and other Property—Year ending June 30th, 1917.

SUMMARY.

		Passenger	Freight	Excluded		Passenger	
		$ 36.00	$ 4,960.00		Intra. 69.87%		$341.40
$1,532.23	Common—29.54% Pass.	452.62			Inter. 30.13%		147.22
							$488.62
	70.46% Frt.		1,079.61	1,140.50			
		$488.62	$ 6,039.61	$ 1,140.50			

COMPLAINANT'S EXHIBIT 206

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Joint Facility Revenue—Cr.—Year Ending June 30th, 1917

	Total	Freight	Passenger
From Sault Ste. Marie Bridge Switching Account—D. S. S. & A. Pro. of revenue earned by the Switching Account transferring freight across the International Bridge	$1,265.34	$1,265.34	
D. S. S. & A. Pro. of Sault Ste. Marie Bridge Co.'s revenue from local fares over the Bridge	69.31		69.31
D. S. S. & A. Pro. of amount collected by the Bridge Co. from the Michigan State Telephone Co. for the privilege of stringing wires over the Bridge	15.50	13.87	① 1.63
D. S. S. & A. Pro. of rentals received by the Sainte Marie Union Depot [illegible] for:			
Lunch Counter and Express Office in Passenger Station	299.34		299.34
Warehouse sites (Freight)	205.00	205.00	
Use of Passenger Facilities by the C. P. Ry	637.21		637.21
Parcel Room Receipts	23.95		23.95
	$2,515.65	$1,484.21	$1,031.44

①Divided between Freight and Passenger on relation of D. S. S. & A. freight revenue and passenger revenue to D. S. S. & A. total revenue on traffic passing over the Bridge.

			Intrastate	Interstate
Located	$ 71.94			$ 71.94
Common	959.50—Intra. 69.87%		$670.40	
	Inter. 30.13%			289.10
	$1,030.44		$670.40	$ 361.04

Joint Facility Revenue—Dr.

	Total	Freight	Passenger
Paid M. St. P. & S. S. M. Ry. Co. One half of amount collected from C. P. Ry. for turning their passenger train on "Y" at Soo, Mich.	$2.62	$ 1.85	$ .77

Pass. Intra. 30.13%—$ .23
Inter. 69.87%— .54
.77

Rev. Basis
2.62 Frt. 70.46% $1.85
Pass. 29.54% .77

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Details of Miscellaneous Revenue—Michigan—Year Ending June 30, 1917

	Total	Freight	Passenger	Common
Dockage at St. Ignace	$3,332.54	$ 3,332.54		
Weighing Cars (Freight)	33.00	33.00		
Collections for delay to Freight Trains account unloading freight	95.10	95.10		
Trackage of trains, Freight	573.43	573.43		
Trackage of trains, Passenger	133.00		133.00	
Clergy Permits	261.94		261.94	
Commission on sale of Travelers Ins. Tkts.	43.13		43.13	
Garnishee Fees and Commission on amounts deducted on Payrolls	297.39			297.39
Commercial Allowance on tickets—C. P. Ry.	19.11		19.11	
Customs Brokerage Fees	719.75	719.75		
Turning C. P. Ry. Pass. Train on "Y" Soo	5.25		5.25	
Gravel and Cinders Sold	66.25			66.25
Rental of Hand Cars	26.50			26.50
Service of Train Crew Fighting Fire	35.00			35.00
Use of Shop Equipment at Soo, washing boilers	1.00			1.00
Refund of charge for refrigeration (Error)	18.00	18.00		
	$ 5,624.39	$ 4,735.82	462.43	426.14
$426.14—Pass. 29.54% Rev. Basis			125.88	
Frt. 70.46% Rev. Basis		300.26		
Total	$ 5,624.39	$ 5,036.08	$588.31	
Dockage & Handling Iron Ore	$44,473.79	$44,473.79		

Pass. $588.31—Intra. 30.13%—$177.26
Inter. 69.87%— 411.05
$588.31

COMPLAINANT'S EXHIBIT 205

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Special Service Train Revenue—Year Ending June 30th, 1917.

Month	Item	Entire Line		Michigan		Mich. Intrastate	
		Frt.	Pass.	Frt.	Pass.	Frt.	Pass
1916							
July	Barkoot's Carnival Co.	14 Cars 945.00	6 Cars 405.00	945.00	405.00	945.00	405.00
July	Howe's Great London Shows	13 Cars 911.24	8 Cars 560.76	911.24	560.76	911.24	560.26
July	H. C. Pierce		51.00				
Aug.	Parker Carnival	21 Cars 490.00	9 Cars 210.00	490.00	210.00	490.00	210.00
Oct.	Every Woman Theatrical Co.		98.00		98.00		
Dec.	Cole Bros. Circus (June, 1916)	108.00	54.00	108.00	54.00	108.00	54.00
1917							
Jan.	San Carlos Opera Co.		526.00		296.77		
Feb.	Daddy Long Legs Theatrical Co.		98.00		98.00		
June	La Tona's Circus	9 Cars 942.00	6 Cars 628.00	838.80	559.20	838.80	559.20
		2,180.24	2,522.76	3,077.04	2,173.73	3,077.04	1,680.96

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Detail of D. S. S. & A. Other Passenger Train Revenue in Michigan—Year ending June 30, 1917.

Month	From	To	Total Mich. Amount	Intrastate Amount	Interstate Amount	
1916						
July	Marquette	Negaunee	15.00	15.00		Haulage of Baggage Car.
	Ishpeming	Marquette	15.00	15.00		Haulage of Baggage Car.
	Sand River	Marquette	.46	.46		Excess fares on I. C. C. Car No. 19.
	Michigamme	Ohio Mine and Retn.	3.50	3.50		Dead Head Mileage on Special Train.
Aug.	Ishpeming	Humboldt	1.80	1.80		Excess fares for Car.
	Mack. City	Marquette	7.70	7.70		Excess fares acct. Mich. Fish Car.
	Chicago	Calumet and Retn.	413.34		413.34	Officials of C. & H. Mng. Co. acct. 50th Anniversary.
Sept.	Houghton	Saxon	75.39		75.39	Spl. Train for "Garden of Allah" Co.
	Marquette	Houghton	47.50	47.50		Spl. Train for "Garden of Allah" Co.
	Calumet	White Pine Mine	12.83	12.83		To Coal Deficit on Spl. Train—Calumet to White Pine Mine.
	Marquette	Negaunee	15.00	15.00		Haulage of Baggage Car.
	Negaunee	Marquette	15.00	15.00		Haulage of Baggage Car.
	Humboldt	Champion	1.74	1.74		Excess Fares on I. C. C. Car No. 19.
	Champion	Michigamme	.46	.46		Excess Fares on I. C. C. Car No. 19.
	Michigamme	Summit	1.35	1.35		Excess Fares on I. C. C. Car No. 19.
	L'Anse	Baraga	.88	.88		Excess Fares on I. C. C. Car No. 19.
	Baraga	Keweenaw Bay	.60	.60		Excess Fares on I. C. C. Car No. 19.
	Herman	Summit	1.75	1.75		Excess Fares on I. C. C. Car No. 19.
	Herman	L'Anse	1.20	1.20		Excess Fares on I. C. C. Car No. 19.
Oct.	Soo	Houghton	10.00	10.00		Excess Fares for Baggage Car.
	Raco	Soo	21.74	21.74		Deficit on Special Train.
	Mack. City	Marquette	16.72	16.72		Excess Fares for Baggage Car Haul.
	Marquette	Houghton	10.10	10.10		Excess Fares for Baggage Car Haul.
	Marquette	Republic	9.70	9.70		Excess Fares for Gov. Fisheries Car.
	Ishpeming	Saxon	5.82		5.82	Excess Fares for Baggage Car Haul.
	Republic	Marquette	9.70	9.70		Excess Fares for Gov. Fisheries Car.
	Keweenaw Bay	Arnheim	1.52	1.52		Excess Fares for I. C. C. Car No. 19.
	Chassell	Houghton	.96	.96		Excess Fares for I. C. C. Car No. 19.
	Houghton	Marquette	2.84	2.84		Excess Fares for I. C. C. Car No. 19.
	Houghton	Ishpeming	2.59	2.59		
	Kenton	Trout Creek	.20	.20		Excess Fares on I. C. C. Car No. 19.
	Paynesville	Ewen	1.89	1.89		Excess Fares on I. C. C. Car No. 19.
	Ewen	Yrocsheck	1.80	1.80		Excess Fares on I. C. C. Car No. 19.
	Thomaston	Bessemer	2.50	2.50		Excess Fares on I. C. C. Car No. 19.
Nov.	Marquette	Ishpeming	22.23	22.23		Deficit on Special Train.
	Thomaston	Tula	1.46	1.46		Excess Fares on I. C. C. Car No. 19.
	St. Ignace	Marquette	76.00	76.00		Spl. Train for "Garden of Allah" Co.
Dec.	Marquette	Ishpeming	7.20	7.20		Deficit on Special Train.
	Ishpeming	Marquette	20.08	20.08		Deficit on Special Train.
	Marquette	Ishpeming	6.40	6.40		Deficit on Special Train.
	Trout Lake	Petoskey	16.96	16.96		Excess Fares for Baggage Car Haul.
1917						
Jan.	Marquette	Ishpeming	13.75	13.75		Deficit on Special Train.
	Negaunee	Marquette	15.00	15.00		Haulage of Baggage Car.
Feb.	Ishpeming	Soo	6.80	6.80		Excess Fares for Baggage Car Haul.
	Ishpeming	Marquette	15.00	15.00		Haulage of Baggage Car.
	Champion	Ishpeming	15.00	15.00		Haulage of Baggage Car.
	Saxon	Ishpeming	13.94		13.94	Excess Fares for Baggage Car Haul.
Mar.	Soo	Houghton	37.50	37.50		Excess Fares for Baggage Car Haul.
	Soo	St. Ignace	16.70	16.70		Excess Fares for Baggage Car Haul.
	Munising	Soo	20.15	20.15		Excess Fares for Baggage Car Haul.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

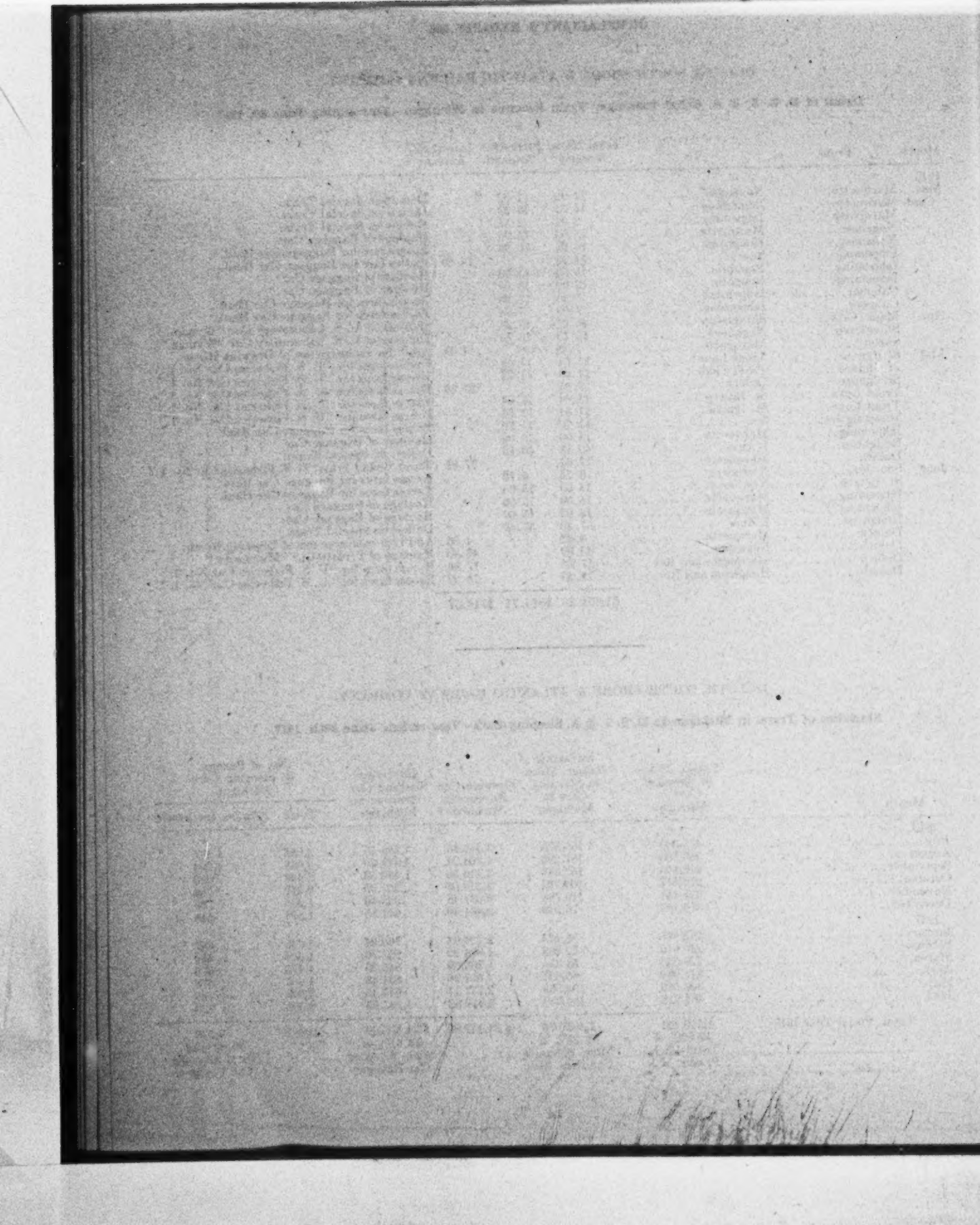
Detail of D. S. S. & A. Other Passenger Train Revenue in Michigan—Year ending June 30, 1917.

Month	From	To	Total Mich. Amount	Intrastate Amount	Interstate Amount	
1917						
Mar.	Marquette	Negaunee	11.92	11.92		Deficit on Special Train.
Cont.	Marquette	Ishpeming	14.33	14.33		Deficit on Special Train.
	Marquette	Ishpeming	2.31	2.31		Deficit on Special Train.
	Nagaunee	Marquette	15.00	15.00		Haulage of Baggage Car.
	Nagaunee	Houghton	10.06	10.06		Excess fare for Baggage Car Haul.
	Ishpeming	Saxon	14.59		14.59	Excess fare for Baggage Car Haul.
	Ishpeming	Republic	15.00	15.00		Haulage of Baggage Car.
	Ishpeming	Republic	15.00	15.00		Haulage of Baggage Car.
	Calumet	Ishpeming	7.26	7.26		Excess fares for Baggage Car Haul.
	Calumet	Ishpeming	7.98	7.98		Excess fares for Baggage Car Haul.
Apr.	Mack. City	Shingleton	25.25	25.25		Haulage of U. S. Laboratory Car "Wyman."
	Shingleton	Negaunee	15.75	15.75		Haulage of U. S. Laboratory Car "Wyman."
	Saxon	Marquette	4.48		4.48	Add'l for exclusive use of Drawing Room.
May	St. Ignace	Trout Lake	11.64	11.64		Excess fares for "U. S. Fisheries Car No. 1."
	St. Ignace	Trout Lake	11.64	11.64		Excess fares for "U. S. Fisheries Car No. 1."
	St. Ignace	Duluth	27.65		27.65	Excess fares for "U. S. Fisheries Car No. 1."
	Trout Lake	St. Ignace	11.64	11.64		Excess fares for "U. S. Fisheries Car No. 1."
	Trout Lake	St. Ignace	11.64	11.64		Excess fares for "U. S. Fisheries Car No. 1."
	Munising Jct	Soo	11.70	11.70		Excess fares for Baggage Car Haul.
	Ishpeming	Marquette	15.00	15.00		Haulage of Baggage Car.
	Houghton	L'Anse	40.13	40.13		Deficit on Special Train.
	Duluth	Marquette	77.91		77.91	Three Round Trips "U. S. Fisheries Car No. 1."
June	Soo. Jct	Newberry	6.75	6.75		Excess fares for Baggage Car Haul.
	St. Ignace	Newberry	13.05	13.05		Excess fares for Baggage Car Haul.
	Ishpeming	Marquette	15.00	15.00		Haulage of Baggage Car.
	Ishpeming	Marquette	15.00	15.00		Haulage of Baggage Car.
	Houghton	L'Anse	57.40	57.40		Deficit on Special Train.
	Duluth	Marquette	4.06		4.06	Add'l for exclusive use of Drawing Room.
	Duluth	Negaunee	43.30		43.30	Haulage of Private Car "Minnesota."
	Duluth	Marquette and Ret.	17.86		17.86	Excess fares for "U. S. Fisheries Car No. 1."
	Duluth	Houghton and Ret.	18.23		18.23	Excess fares for "U. S. Fisheries Car No. 1."
			$1,601.28	$884.71	$716.57	

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statistics of Travel in Michigan in D. S. S. & A. Sleeping Cars—Year ending June 30th, 1917.

Month	Passgr. Miles in Sleeping Cars in Michigan	Intrastate Passgr. Miles in Sleeping Cars in Michigan	Sleeping Car Revenue in Michigan	Intrastate Sleeping Car Revenue in Michigan	No. of Passgrs. in Sleeping Cars Michigan	
					Total	Number Intrastate
1916						
July	475,336	185,575	3,416.88	1,366.15	2,658	1,167
August	543,266	187,236	4,104.34	1,541.60	3,061	1,204
September	446,806	152,348	3,416.50	1,160.50	2,448	920
October	276,617	108,701	3,213.06	957.95	2,312	784
November	321,461	119,784	2,631.45	923.40	1,965	785
December	310,462	76,229	2,431.40	641.85	1,831	516
1917						
January	267,845	88,413	2,226.93	768.04	1,719	647
February	230,615	72,263	1,896.20	581.70	1,393	459
March	229,333	58,334	1,985.39	540.25	1,473	470
April	317,080	95,991	2,654.96	851.45	1,987	678
May	326,582	103,863	2,737.11	945.45	2,038	780
June	464,918	152,339	3,433.58	1,197.65	2,596	923
Total, Fiscal Year 1917	4,210,321 12.59% of Total Mich. Passgr. Mile	1,401,076 33.28% of Mich. Sleeping Car Pass. Mile	$ 34,147.80	$ 11,475.99 33.61% of Mich. Sleeping Car Revenue	25,481	9,333 36.63% of Total Sleeping Car Passgrs.



DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statistics of Travel in Michigan in Foreign Sleeping Cars—Year ending June 30th, 1917.

Month	Total Passenger Miles in Sleeping Cars in Michigan	Intrastate Passenger Miles in Sleeping Cars in Michigan	Number of Passengers in Sleeping Cars—Michigan	
			Total	Intrastate
1916				
July	121,210	56,649	2,383	853
August	166,416	81,023	3,044	1,156
September	158,191	84,851	2,838	1,272
October	128,364	68,200	2,148	992
November	116,661	66,809	2,140	1,114
December	125,356	63,576	2,171	951
1917				
January	127,610	56,232	2,084	833
February	78,877	39,567	1,343	562
March	78,897	39,216	1,355	559
April	122,938	61,205	2,029	846
May	105,716	58,480	1,782	809
June	146,850	70,705	2,576	1,038
	1,477,086—100%	746,513—50.54%	25,893—100%	10,985—42.42%

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Hire of Equipment—1917.

	System	%	Mich.	%	Mich. Frt.	%	Mich. Passgr.		
Rent Received from Hire of Equipment:									
Locomotives leased to Soo Bdge. Swch. A/C	$ 7,495.00	84.91	$ 6,364.00	84.08	(a) $ 5,350.85	15.92	$ 1,013.15		
(c) Locomotives leased to other:									
Passengers	1,012.16		839.79				839.79		
Freight	4,008.20		2,360.88		3,360.88				
Work	613.00		443.00	61.44 (b)	272.18	38.56	170.82		
Various	1,159.83		1,133.39		1,100.91		32.48		
	$ 14,288.19		$ 12,141.06						
Passenger Train Cars	306.02		250.75				250.75		
Work Equipment	1,507.43		1,235.19	61.44 (b)	758.90	38.56	476.29		
								Intrastate %	
Total Received	$ 16,101.64		$ 13,627.00		$ 10,843.72		$ 2,783.28	69.87	$ 1,945
Rent Paid for Hire of Equipment:									
For Freight Cars	$ 100,845.82		$ 82,633.06		$ 82,633.06				
For Locomotives, Passengers	13.73		11.25				11.25		
Freight	6,020.37		4,933.09		4,933.09				
For Passenger Cars	499.29		409.12				409.12		
For Sleepers	1,520.61		1,245.99				1,245.99		
								Intrastate %	
Total Paid	$ 108,899.82		$ 89,232.51		$ 87,566.15		$ 1,666.36	69.87	$1,165

Operating Expense Acct. 326.

Mich. ..... $11,342—100%
Mich. Pass. ..... 4,374—38.56%

(a) On basis of use by D. S. S. & A. Ry.
(b) On basis Repair Work Equipment.
(c) On basis of use of Individual Locomotives by D. S. S. & A.

COMPLAINANT'S EXHIBIT 206

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of { The Total Operating Expenses. / The Operating Expenses in Michigan. / The Passenger Operating Expenses in Michigan.

Year Ended June 30, 1914.

Acct. No.		Operating Expenses Entire Line	Operating Expenses Michigan	Michigan Operating Expenses			Passenger Proportion of Common		Total Mich. Passenger Operating Expenses
				Assigned to Pass.	Common (1)	Common (2)	%	Amount	
	Maintenance of Way and Structures:								
1	Superintendence	$ 23,233	$ 19,283			19,283	42.39 (D-2)	8,174	$ 8,174
2	Ballast	20,376	20,198		20,198		45.09 (D-1)	9,107	9,107
3	Ties	117,364	91,620		91,620		45.09 (D-1)	41,311	41,311
4	Rails	50,034	48,268		48,268		45.09 (D-1)	21,764	21,764
5	Other Track Material	30,509	27,132		27,132		45.09 (D-1)	12,234	12,234
6	Roadway and Track	332,089	276,353		276,353		45.09 (D-1)	124,608	124,608
7	Removal of Snow, Sand and Ice	20,071	18,450		18,450		45.09 (D-1)	8,319	8,319
9	Bridges, Trestles and Culverts	76,702	45,886		45,886		45.09 (D-1)	20,690	20,690
10	Over and Under Grade Crossings	74	74		74		45.09 (D-1)	33	33
11	Grade Crossings, Fences and Cattle Guards and Signs	9,795	8,758		8,758		45.09 (D-1)	3,949	3,949
12	Snow and Sand Fences and Snowsheds	1,051	1,021		1,021		45.09 (D-1)	460	460
13	Signals and Interlocking Plants	442	180		180		45.09 (D-1)	81	81
14	Telegraph and Telephone Lines	3,340	3,072		3,072		45.09 (D-1)	1,385	1,385
16	Buildings, Fixtures and Grounds	62,160	57,581	688		54,474	(D-3)	17,479	18,167
17	Docks and Wharves	34,364	34,364	885					885
18	Roadway Tools and Supplies	9,526	7,906			7,906	42.39 (D-2)	3,351	3,351
19	Injuries to Persons	3,630	2,734	2		2,706	42.39 (D-2)	1,147	1,149
20	Stationery and Printing	853	708			708	42.39 (D-2)	300	300
21	Other Expenses	167	139			139	42.39 (D-2)	59	59
22	Maint'g Jt. Trks., Yds. and other Fac.—Dr.	9,462	8,138	830	36		45.09 (D-1)	16	846
23	Maint'g Jt. Trks., Yds. and other Fac.—Cr.	10,156	10,156	2,576	4,306		45.09 (D-1)	1,943	4,518
		$ 795,086	$ 661,709	171	536,742			272,525	$ 272,354
	Changes arising from allocation of cost of maintenance of Exclusive Freight Tracks—Deduct								21,517
	Total Maint. of Way and Struct.	$ 795,086	$ 661,709	171	536,742				$ 250,837

COMPLAINANT'S EXHIBIT 206

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of { **The Total Operating Expenses.** / **The Operating Expenses in Michigan.** / **The Passenger Operating Expenses in Michigan.**

Year Ended June 30, 1914.

Acct. No.		Operating Expenses Entire Line	Operating Expenses Michigan	Michigan Operating Expenses Assigned to Pass.	Common (1)	Common (2)	Passenger Proportion of Common %	Passenger Proportion of Common Amount	Total Mich. Passenger Operating Expenses
	Maintenance of Equipment:								
24	Superintendence	$ 12,662	$ 10,637			10,637	28.54 (D-4)	3,036	$ 3,036
25	Steam Locomotives—Repairs	113,758	95,640	34,979					34,979
26	Steam Locomotives—Renewals	206	151	7					7
27	Steam Locomotives—Depreciation	24,560	20,784	6,335					6,335
31	Passenger Train Cars—Repairs	41,855	35,083	35,083					35,083
33	Passenger Train Cars—Depreciation	7,199	6,034	6,034					6,034
34	Freight Train Cars—Repairs	141,008	118,672						
35	Freight Train Cars—Renewals	698	588						
36	Freight Train Cars—Depreciation	65,205	54,876						
43	Work Equipment—Repairs	10,784	8,859		8,114		45.09 (D-1)	3,658	3,658
45	Work Equipment—Depreciation	3,469	2,850		2,611		45.09 (D-1)	1,177	1,177
46	Shop Machinery and Tools	7,071	5,940			5,940	28.54 (D-4)	1,695	1,695
48	Injuries to Persons	866	881			577	28.54 (D-4)	165	165
49	Stationery and Printing	1,303	1,095			1,095	28.54 (D-4)	312	312
50	Other Expenses	25	21			21	28.54 (D-4)	6	6
51	Maint'g Jt. Equip. at Terminals—Dr.	803	35	16					16
		$ 431,060	$ 361,844	$ 82,440				10,049	$ 92,489
	Traffic Expenses:								
53	Superintendence	$ 31,901	$ 26,441	11,857					$ 11,857
54	Outside Agencies	44,617	37,009	23,153					23,153
55	Advertising	5,046	4,193	4,186					4,186
56	Traffic Association	297	245						
57	Fast Freight Lines	660	546						
58	Industrial and Immigration Bureaus	11,056	9,583			9,583	(D-5)	3,517	3,517
59	Stationery and Printing	12,130	10,050	3,502					3,502
		$ 105,707	$ 88,967	42,698				3,517	$ 46,215

COMPLAINANT'S EXHIBIT 206

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of { The Total Operating Expenses. / The Operating Expenses in Michigan. / The Passenger Operating Expenses in Michigan.

Year Ended June 30, 1914.

Acct. No.	Transportation Expenses:	Operating Expenses Entire Line	Operating Expenses Michigan	Michigan Operating Expenses			Passenger Proportion of Common		Total Michigan Passenger Operating Expenses
				Assigned to Pass.	Common (1)	Common (2)	%	Amount	
61	Superintendence	21,998	18,786			18,786	(D-8)	5,200	5,200
62	Dispatching Trains	16,585	13,944			13,944	40.72 (D-6)	5,678	5,678
63	Station Employes	166,606	147,375	10,756		69,510	40.72 (D-6)	28,304	39,060
64	Weighing and Car Service Assos	1,793	1,483						
65	Coal and Ore Docks	21,704	21,704						
66	Station Supplies and Expenses	12,272	10,856			10,856	26.50 (D-9)	2,878	2,878
67	Yard Masters and their Clerks	4,659	4,659			4,659	3.18 (D-15)	148	148
68	Yard Conductors and Brakemen	47,655	47,655			47,655	3.18 (D-15)	1,515	1,515
69	Yard Switch and Signal Tenders	4,052	4,052			4,052	3.18 (D-15)	129	129
70	Yard Supplies and Expenses	1,312	1,312			1,312	3.18 (D-15)	42	42
71	Yard Enginemen	27,328	27,328			27,328	3.18 (D-15)	869	869
72	Enginehouse Expenses—Yard	14,310	14,310			14,310	(D-10)	408	408
73	Fuel for Yard Locomotives	22,745	22,745			22,745	3.18 (D-15)	723	723
74	Water for Yard Locomotives	1,520	1,520			1,520	3.18 (D-15)	48	48
75	Lubricants for Yard Locomotives	280	280			280	3.18 (D-15)	9	9
76	Other Supplies for Yard Locomotives	425	425			425	3.18 (D-15)	14	14
77	Operating Jt. Yards & Terminals—Dr.	42,671	18,595	6,492		3,213			6,492
78	Operating Jt. Yards & Terminals—Cr.	14,341	14,341				61.89 (D-12)	1,989	1,989
80	Road Enginemen	180,007	149,480	60,445					60,445
81	Enginehouse Expenses—Road	51,807	42,917			42,917	41.70 (D-11)	17,896	17,896
82	Fuel for Road Locomotives	323,794	268,348	92,012					92,012
83	Water for Road Locomotives	18,773	15,558	5,335					5,335
84	Lubricants for Road Locomotives	4,328	3,587	1,230					1,230
85	Other Supplies for Road Locomotives	5,654	4,675	1,265					1,265
88	Road Trainmen	214,038	177,749	58,444					58,444
89	Train Supplies and Expenses	40,664	33,998	27,071					27,071
90	Interlockers, Block and Other Signals —Operation	1,277	24		24		45.09 (D-1)	11	11
91	Crossing Flagmen and Gatemen	8,362	7,922			7,922	5.24	415	415
93	Clearing Wrecks	4,100	3,045	871		29	40.72 (D-6)	12	883
94	Telegraph and Telephone—Operation	143	143			143	40.72 (D-6)	58	58
97	Stationery and Printing	12,432	10,652			10,652	30.53 (D-7)	3,252	3,252
98	Other Expenses	1,067	918	67		193	30.53 (D-7)	59	126
99	Loss and Damage—Freight	8,513	7,040						
100	Loss and Damage—Baggage	667	347	347					347
101	Damage to Property	6,815	4,810	27		1,727	40.72 (D-6)	703	730
102	Damage to Stock on Right of Way	1,002	934	860					860
103	Injuries to Persons	19,981	17,040	4,016		773	40.72 (D-6)	315	4,331
104	Operating Joint Tracks—Dr	2,541	714	96		67	40.72 (D-6)	27	123
105	Operating Joint Tracks—Cr	4,981	3,563	808			(D-13)	205	1,013
		1,294,558	1,089,026	268,526	24			66,519	335,045

COMPLAINANT'S EXHIBIT 208

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of { **The Total Operating Expenses.** / **The Operating Expenses in Michigan.** / **The Passenger Operating Expenses in Michigan.**

Year Ended June 30, 1914.

Acct. No.		Operating Expenses Entire Line	Operating Expenses Michigan	Michigan Operating Expenses			Passenger Proportion of Common		Total Michigan Passenger Operating Expenses
				Assigned to Pass.	Common (1)	Common (2)	%	Amount	
	General Expenses:								
106	Salaries and Expenses of General Officers	$ 24,949	20,905			20,905	32.92 (D-14)	6,882	$ 6,882
107	Salaries and Expenses of Clerks and Attendants	38,681	32,411			32,411	32.92 (D-14)	10,670	10,670
108	Gen. Office Supplies and Expenses	3,741	3,135			3,135	32.92 (D-14)	1,032	1,032
109	Law Expenses—Cost of Suit 32,092 / —Other 9,949	9,949	8,336			8,336	32.92 (D-14)	2,744	2,744
110	Insurance	10,592	9,233	411		4,286	32.92 (D-14)	1,411	1,822
112	Pensions	720	603			603	32.92 (D-14)	198	198
113	Stationery and Printing	5,033	4,217			4,217	32.92 (D-14)	1,388	1,388
114	Other Expenses	3,266	2,726			2,726	32.92 (D-14)	897	897
115	Gen'l Administration Jt. Tr'ks Y'ds and Ter'ls—Dr.	555	151	92					92
116	Gen'l Administration Jt. Tr'ks, Y'ds and Ter'ls—Cr.	197	197			197	32.92 (D-14)	65	65
	Valuation Expenses	8,208	6,809			6,800	32.92 (D-14)	2,241	2,241
		$ 105,497	88,329	503		83,231		27,398	$ 27,901

SUMMARY, 1914.

	Entire Line Operating Expense	Michigan Operating Expense				Michigan Passenger Operating Expense
Maint. of Way and Structures	$ 795,086	661,709	171			$ 250,837
Maint. of Equipment	431,060	361,844	82,440		10,049	92,489
Traffic Expenses	105,707	88,067	42,698		3,517	46,215
Transportation Expenses	1,294,558	1,089,026	268,526		66,519	335,045
General	105,497	88,329	503		26,999	27,901
Total	$2,731,908	2,288,975	393,996			$ 752,487

COMPLAINANT'S EXHIBIT 206

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Passenger Business in Michigan—Year ended June 30th, 1914.

	Total Michigan	Intrastate	Interstate
Passenger Revenue (Intra. 64.98% actually located)	$ 954,037	$ 619,934	$ 334,103
Excess Baggage Rev. (Intra. 69.48% actually located)	8,411	5,844	2,567
Mail Revenue (Divided between Intra. and Inter. on Rev. Basis)	54,434	35,371	19,063
Express Revenue (Divided between Intra. and Inter. on Rev. Basis)	29,659	19,272	10,387
Milk Revenue on Passenger Trains (All Intrastate)	316	316	.....
Other Pass. Train Revenue (Intra. actually located)	1,682	948	734
Other Pass. Train Revenue (Intra. 64.98% Rev. Basis)	5,475	3,558	1,917
Special Service Train Revenue (Intra. actually located)	1,075	1,050	25
Station and Train Privileges (Intra. 64.98% Rev. Basis)	498	324	174
Parcel Room Receipts (Intra. 64.98% Rev. Basis)	79	51	28
Storage of Baggage (Intra. 64.98% Rev. Basis)	66	43	23
Telegraph Service Rev. (Pass. 35.98% Intra. 64.98%)	210	136	74
Rent of Buildings and Other Property (Intra. 64.98%)	1,064	691	373
Joint Facility Revenue (Balance) (Intra. 64.98% Rev. Basis)	781	457	324
Miscellaneous Revenue (Intra. 64.98% Rev. Basis)	1,183	769	414
	$1,058,970	$ 688,764	$ 370,206
Sleeping Car Revenue (Intra. 32.39%) (1916 Ratio)	$ 30,482	$ 9,873	$ 20,609
Dining Car Revenue (Intra. 64.98%)	34,966	22,721	12,245
Rents Rec'd. (Joint Facil.) (Intra. 64.98%)	8,393	5,454	2,939
Interest (Pass. 35.98%—Intra. 64.98%)	1,794	1,166	628
Total Income	$1,134,605	$ 727,978	$ 406,627
Operating Expenses—Michigan	$ 752,497	$ 481,695	$ 270,802
Sleeping Car Expenses—Michigan (Intra. 25.34%)	18,540	4,698	13,842
Dining Car Expenses—Michigan (Intra. 64.98%)	44,076	28,641	15,435
Rents Paid (Joint Facil.)—Michigan	2,379	1,036	1,343
Hire of Equipment (Bal. Dr.)—Michigan (Intra. 64.98%)	1,272	826	446
Taxes	83,390	41,001	22,379
	$ 982,134	$ 557,897	$ 324,247
Net Income	$ 252,471	$ 170,091	$ 82,380
Estimated Loss by Application of Act 276	$ 196,046	$ 131,299	$ 64,747
	$ 56,425	$ 38,792	$ 17,633
Less Mail and Express	$ 1,921	$ 2,043	$ 122
	$ 54,504	$ 36,749	$ 17,755

COMPLAINANT'S EXHIBIT 207

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of { The Total Operating Expenses. / The Operating Expenses in Michigan. / The Passenger Operating Expenses in Michigan.

Year Ended June 30, 1915.

Acct. No.		Operating Expenses Entire Line	Operating Expenses Michigan	Michigan Operating Expenses			Passenger Proportion of Common		Total Mich. Passenger Operating Expenses
				Assigned to Pass.	Common (1)	Common (2)	%	Amount	
	Maintenance of Way and Structures:								
201	Superintendence	$ 22,331	17,362			17,362	47.81 (D-2)	8,301	$ 8,301
202	Roadway Maintenance	47,209	39,269		39,269		48.65 (D-1)	19,104	19,104
208	Bridges, Trestles and Culverts	86,936	39,368		39,368		48.65 (D-1)	19,153	19,153
212	Ties	95,352	79,393		79,393		48.65 (D-1)	38,625	38,625
214	Rails	20,682	19,782		19,782		48.65 (D-1)	9,624	9,624
216	Other Track Material	23,469	21,806		21,806		48.65 (D-1)	10,608	10,608
218	Ballast	10,362	9,703		9,703		48.65 (D-1)	4,721	4,721
220	Track Laying and Surfacing	178,067	145,548		145,548		48.65 (D-1)	70,809	70,809
221	Right-of-Way Fences	5,616	3,309		3,309		48.65 (D-1)	1,610	1,610
223	Snow and Sand Fences and Snow Sheds	244	199		199		48.65 (D-1)	97	97
225	Crossings and Signs	1,656	1,304		1,304		48.65 (D-1)	634	634
227	Station and Office Buildings	7,089	6,409	1,351	3,723		48.65 (D-1)	1,811	3,162
229	Roadway Buildings	1,933	1,193		1,193		48.65 (D-1)	580	580
231	Water Stations	5,065	4,438			4,438	35.31 (D-16)	1,567	1,567
233	Fuel Stations	2,581	1,330			1,330	35.31 (D-16)	470	470
235	Shops and Enginehouses	3,519	3,464			3,464	30.62 (D-17)	1,090	1,090
241	Wharves and Docks	884	884	190					190
243	Coal and Ore Wharves	2,091	2,091						
244	Coal and Ore Wharves—Depreciation	19,146	19,146						
247	Telegraph and Telephone Lines	2,857	2,539		2,539		48.65 (D-1)	1,235	1,235
249	Signal and Interlockers	492	198		198		48.65 (D-1)	96	96
267	Paving	8	8		8		48.65 (D-1)	4	4
269	Roadway Machines	845	657			657	47.81 (D-2)	314	314
271	Small Tools and Supplies	7,954	6,184			6,184	47.81 (D-2)	2,956	2,956
272	Removing Snow, Ice and Sand	21,306	20,060		20,060		48.65 (D-1)	9,759	9,759
273	Assessments for Public Improvements	233	99		99		48.65	48	48
274	Injuries to Persons	2,826	1,810			1,785	47.81 (D-2)	853	853
275	Insurance	4,532	3,979	127		2,456	(D-18)	987	1,114
276	Stationery and Printing	713	554			554	47.81 (D-2)	264	264
277	Other Expenses	105	82			82	47.81 (D-2)	39	39
278	Maint'g Jt. Trks. Yds. and Other Facilities—Dr	8,505	6,098	608	66		48.65 (D-1)	32	640
279	Maint'g Jt. Trks. Yds. and Other Facilities—Cr	13,632	13,632	4,160	6,752			3,285	7,445
		$570,976	444,634	1,884	380,815			202,106	$200,222
	Changes made by allocating cost of exclusive freight tracks—Deduct								15,200
	Total Maint. of Way and Structures	$570,976	444,634		380,815			202,106	$185,022

COMPLAINANT'S EXHIBIT 207

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of { **The Total Operating Expenses.** / **The Operating Expenses in Michigan.** / **The Passenger Operating Expenses in Michigan.**

Year Ended June 30, 1915.

Acct. No.		Operating Expenses Entire Line	Operating Expenses Michigan	Michigan Operating Expenses: Assigned to Pass.	Common (1)	Common (2)	Passenger Proportion of Common: %	Passenger Proportion of Common: Amount	Total Mich. Passenger Operating Expenses
	Maintenance of Equipment:								
301	Superintendence	$ 12,520	10,617			10,617	30.66 (D-4)	3,255	$ 3,255
302	Shop Machinery	6,694	5,676			5,676	30.66 (D-4)	1,740	1,740
308	Steam Locomotives—Repairs	93,458	79,744	33,725					33,725
309	Steam Locomotives—Depreciation	23,945	20,643	6,064					6,064
310	Steam Locomotives—Retirements	233	187	2					2
314	Freight Train Cars—Repairs	146,902	125,816						
315	Freight Train Cars—Depreciation	62,766	53,753						
316	Freight Train Cars—Retirements	2,151	1,842						
317	Passenger Train Cars—Repairs	50,303	41,350	41,350					41,350
318	Passenger Train Cars—Depreciation	12,367	10,007	10,007					10,007
326	Work Equipment—assigned 7.83% Repairs Excl. Frt	5,735	4,445		4,097		48.65	1,993	1,993
327	Work Equipment—Depreciation 7.83% assigned Excl. Frt	3,498	2,711		2,499		48.65	1,216	1,216
328	Work Equipment—Retirements 7.83% assigned Excl. Frt	320	248		229		48.65	111	111
332	Injuries to Persons	2,831	2,401	4		1,162	30.66 (D-4)	356	360
333	Insurance	1,789	1,601	331		665	(D-19)	210	541
334	Stationery and Printing	1,101	934			934	30.66 (D-4)	286	286
336	Maint'g Jt. Equip. at Terminals—Dr.	605							
337	Maint'g Jt. Equip. at Terminals—Cr.	13	13			13	30.66 (D-4)	4	4
		$426,749	361,588	91,483				9,163	$100,646
	Traffic Expenses:								
351	Superintendence	$ 31,298	25,938	11,730					$ 11,730
352	Outside Agencies	37,255	30,856	17,830					17,830
353	Advertising	4,549	3,760	3,727					3,727
354	Traffic Associations	346	287						
355	Fast Freight Lines	5	5						
356	Industrial and Immigration Bur's	9,456	8,307			8,307	(D-5)	2,851	2,851
357	Insurance	101	56	56					56
358	Stationery and Printing	12,350	10,239	3,826					3,826
		$ 95,360	79,448	37,169				2,851	$ 40,020

COMPLAINANT'S EXHIBIT 207

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of { The Total Operating Expenses. / The Operating Expenses in Michigan / The Passenger Operating Expenses in Michigan. }

Year Ended June 30, 1915.

Acct. No.	Transportation—Rail Line:	Operating Expenses Entire Line	Operating Expenses Michigan	Michigan Operating Expenses: Assigned to Pass.	Common (1)	Common (2)	Passenger Proportion of Common: %	Passenger Proportion of Common: Amount	Total Michigan Passenger Operating Expenses
371	Superintendence	$ 21,469	18,483			18,483	(D-8)	5,501	$ 5,501
372	Dispatching Trains	12,821	10,662			10,662	44.15 (D-6)	4,707	4,707
373	Station Employees	155,950	138,098	10,933		68,984	44.15 (D-6)	30,456	41,389
374	Weighing, Inspection and Demurrage Bureaus	1,621	1,347						
375	Coal and Ore Wharves	16,704	16,704						
376	Station Supplies and Expenses	10,490	9,289			9,289	29.97 (D-9)	2,784	2,784
377	Yard Masters and Yard Clerks	4,705	4,705			4,705	3.38 (D-15)	159	159
378	Yard Conductors and Brakemen	37,207	37,207			37,207	3.38 (D-15)	1,258	1,258
379	Yard Switch and Signal Tenders	3,992	3,992			3,992	3.38 (D-15)	135	135
380	Yard Enginemen	23,842	23,842			23,842	3.38 (D-15)	806	806
382	Fuel for Yard Locomotives	21,417	21,417			21,417	3.38 (D-15)	724	724
385	Water for Yard Locomotives	1,213	1,213			1,213	3.38 (D-15)	41	41
386	Lubricants for Yard Locomotives	338	338			338	3.38 (D-15)	11	11
387	Other Supplies for Yard Locomotives	380	380			380	3.38 (D-15)	13	13
388	Enginehouse Expenses—Yard	12,912	12,912			12,912	(D-10)	389	389
389	Yard Supplies and Expenses	1,290	1,290			1,290	3.38 (D-15)	44	44
390	Operating Jt. Yds and Terminals—Dr.	38,694	17,081	6,937		2		1	6,938
391	Operating Jt. Yds. and Terminals—Cr.	13,579	13,579			2,988	61.89 (D-12)	1,849	1,849
392	Train Enginemen	155,965	130,182	57,762					57,762
394	Fuel for Train Locomotives	267,712	223,235	85,655					85,655
397	Water for Train Locomotives	14,695	12,253	4,702					4,702
398	Lubricants for Train Locomotives	4,453	3,713	1,425					1,425
399	Other Supplies for Train Locomotives	3,202	2,667	983					983
400	Enginehouse Expenses—Train	44,812	38,019			38,019	41.7 (D-11)	15,854	15,854
401	Trainmen	183,652	152,460	55,158					55,158
402	Train Supplies and Expenses	36,619	30,519	23,193					23,193
403	Operating Sleeping Cars	14,273	10,943	10,943					10,943
404	Signal and Interlocker Operation	1,241	41		41		48.65 (D-1)	20	20
405	Crossing Protection	8,590	8,110			7,749	5.24	406	406
407	Telegraph and Telephone Operation	143	143			143	44.15 (D-6)	63	63
410	Stationery and Printing	11,332	9,756			9,756	33.62 (D-7)	3,280	3,280
411	Other Expenses	1,160	958	14		343	33.62 (D-7)	115	129
412	Operating Jt. Trks. and Fac.—Dr.	3,302	936	118		76	44.15 (D-6)	34	152
413	Operating Jt. Trks. and Fac.—Cr.	4,999	3,550	788		664	Spl. (D-13)	280	1,068
414	Insurance	2,476	1,374	67		488	33.62 (D-7)	164	231
415	Clearing Wrecks	1,287	1,281						
416	Damage to Property	4,927	4,065			390	44.15 (D-6)	172	172
417	Damage to Live Stock on Right-of-Way	1,511	809	691		46	44.15 (D-6)	20	711
418	Loss and Damage—Freight	10,292	8,548						
419	Loss and Damage—Baggage	282	198	198					198
420	Injuries to Persons	23,480	20,836	3,576		257	44.15 (D-6)	113	3,689
		$1,141,873	962,877	261,567				65,141	$326,708

COMPLAINANT'S EXHIBIT 207

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

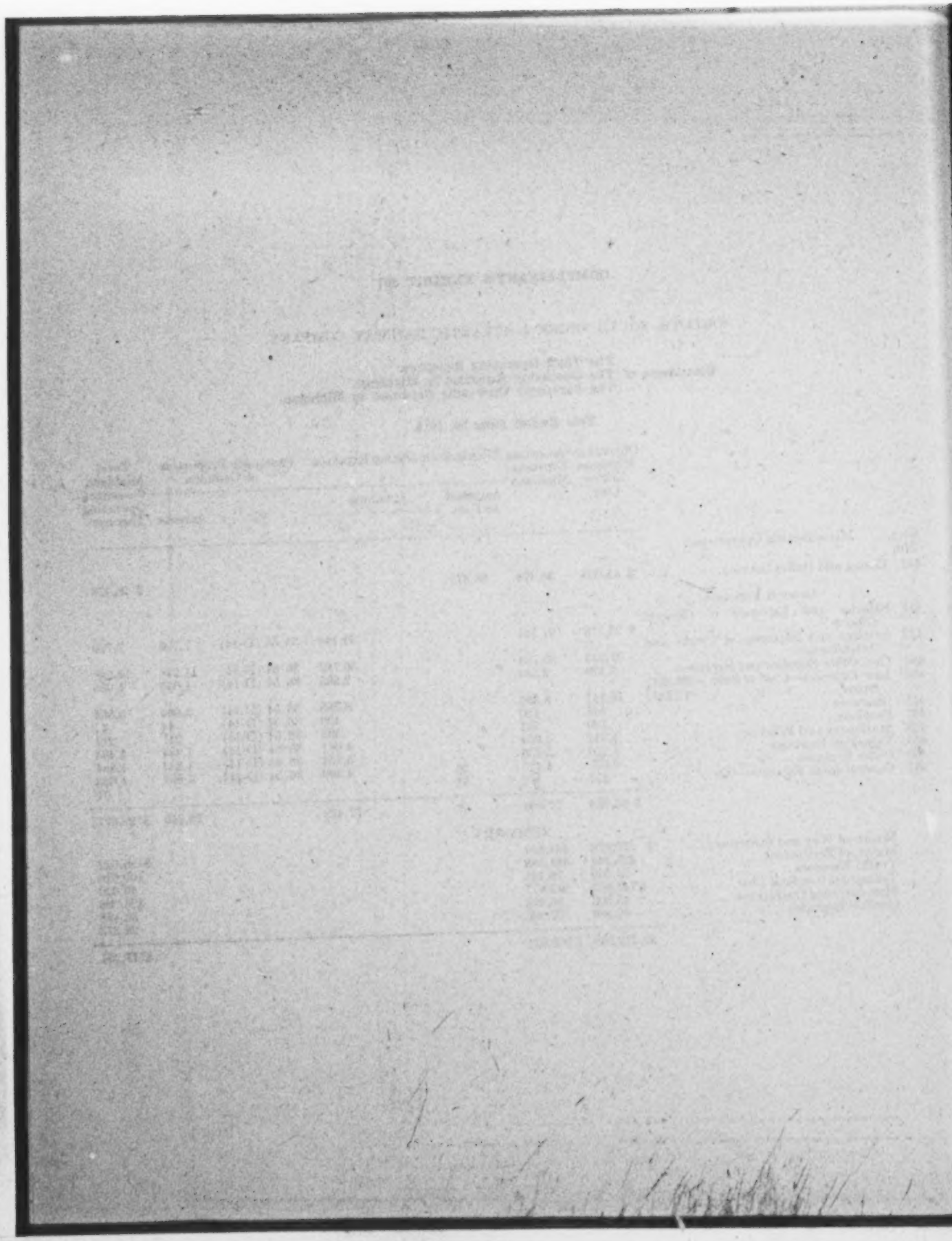
Statement of { The Total Operating Expenses. / The Operating Expenses in Michigan. / The Passenger Operating Expenses in Michigan.

Year Ended June 30, 1915.

Acct. No.		Operating Expenses Entire Line	Operating Expenses Michigan	Michigan Operating Expenses			Passenger Proportion of Common		Total Michigan Passenger Operating Expenses
				Assigned to Pass.	Common (1)	Common (2)	%	Amount	
	Miscellaneous Operations:								
441	Dining and Buffet Service	$ 45,006	36,478	36,478					$ 36,478
	General Expenses:								
451	Salaries and Expenses of General Officers	$ 25,573	21,144			21,144	36.54 (D-14)	7,726	7,726
452	Salaries and Expenses of Clerks and Attendants	37,232	30,783			30,783	36.54 (D-14)	11,248	11,248
453	Gen. Office Supplies and Expenses	3,429	2,835			2,835	36.54 (D-14)	1,036	1,036
454	Law Expenses—Cost of Suit.. 28,884 / Other 10,141	10,141	8,385			8,385	36.54 (D-14)	3,064	3,064
455	Insurance	145	120			120	36.54 (D-14)	44	44
457	Pensions	720	595			595	36.54 (D-14)	217	217
458	Stationery and Printing	4,912	4,061			4,061	36.54 (D-14)	1,484	1,484
459	Valuation Expenses	5,304	5,156			5,156	36.54 (D-14)	1,884	1,884
460	Other Expenses	5,077	4,415	16		4,399	36.54 (D-14)	1,607	1,623
461	General Joint Facilities—Dr	451	112	51					51
		$ 92,984	77,606	67		77,478		28,310	$ 28,377

SUMMARY

Maint. of Way and Structures	$ 570,976	444,634	$185,022
Maint. of Equipment	426,749	361,588	100,646
Traffic Expenses	95,360	79,448	40,020
Transportation Rail Line	1,141,873	962,877	326,708
Miscellaneous Operations	45,006	36,478	36,478
General Expenses	92,984	77,606	28,377
	$2,372,948	1,962,631	$717,251



COMPLAINANT'S EXHIBIT 207

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Passenger Business in Michigan—Year ended June 30th, 1915.

	Total Michigan	Intrastate	Interstate
Passenger Revenue (Intra. 70.97% Actually located)	$ 746,872	$ 530,048	$ 216,824
Excess Baggage (Intra. and Inter., Actually located)	7,291	4,427	2,864
Mail Revenue (Intra. 70.97% Rev. Basis)	54,520	38,693	15,827
Express Revenue (Intra. 70.97% Rev. Basis)	26,863	19,065	7,798
Milk Rev. on Pass. Trains (All Intrastate)	129	129	.....
Other Pass. Train Rev	1,767	1,278	489
Special Service Train Rev	1,033	755	278
Station and Train Privileges (Intra. 70.97% Rev. Basis)	495	351	144
Parcel Room Receipts (Intra. 70.97% Rev. Basis)	449	319	130
Storage-Baggage (Intra. 70.97% Rev. Basis)	87	62	25
Telegraph Service Rev. (Pass. 35.25%—Intra. 70.97% Rev. Basis)	219	155	64
Rents of Bldgs. and Other Property (Intra. 70.97% Rev. Basis)	747	530	217
Joint Facility Rev. (Balance) (Intra. 70.97% Rev. Basis)	1,138	715	423
Miscellaneous Rev. (Intra. 70.97% Rev. Basis)	1,349	958	391
Sleeping Car Rev. (32.39% Intra) (1916 ratio)	27,734	8,983	18,751
Dining Car Rev. (70.97% Intra. on Rev. Basis)	28,284	20,073	8,211
Chair Car Rev. (70.97% Intra. on Rev. Basis)	4,022	2,855	1,167
Rents Received:			
For Hire of Equipment (Intra. 70.97% Rev. Basis)	2,161	1,534	627
For Joint Facilities (Intra. 70.97% Rev. Basis)	13,893	9,860	4,033
Interest (Pass. 35.25%) (Intra. 70.97% Rev. Basis)	1,035	735	300
Total Income	$ 920,088	$ 641,525	$ 278,563
Operating Expenses—Michigan	$ 717,251	$ 492,206	$ 225,045
Rent paid for Hire of Equipment (Intra. 70.97% Rev. Basis)	1,859	1,319	540
Rent paid for Joint Facilities ($497.58 Inter. Bal. Rev. Basis)	1,893	990	903
Taxes on Sleeping Car Tickets (Intra. 30.32% number of Pass.)	77	23	54
Taxes on Observation Car Tickets (Intra. 70.97% Pass. Rev. Basis)	38	27	11
Taxes paid the State of Michigan	63,190	44,416	18,774
	$ 784,308	$ 538,981	$ 245,327
Net	135,780	102,544	33,236
Estimated Loss by Application of Act 276	167,535	125,180	42,355
Loss	$ 31,755	$ 22,636	$ 9,119
Less Mail and Express	8,238	7,012	1,126
Loss	$ 39,993	$ 29,748	$ 10,245

COMPLAINANT'S EXHIBIT 208

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of { The Total Operating Expenses. / The Operating Expenses in Michigan. / The Passenger Operating Expenses in Michigan.

Year Ended June 30, 1916.

Acct. No.	Maintenance of Way and Structures:	Operating Expenses Entire Line	Operating Expenses Michigan	Michigan Operating Expenses Assigned to Pass.	Common (1)	Common (2)	Passenger Proportion of Common %	Passenger Proportion of Common Amount	Total Mich. Passenger Operating Expenses
201	Superintendence	$ 24,651	20,643			20,643	41.83 (D-2)	8,635	$ 8,635
202	Roadway Maintenance	67,951	57,992		57,992		44.63 (D-1)	25,882	25,882
208	Bridges, Trestles and Culverts	60,082	45,887		45,887		44.63 (D-1)	20,479	20,479
212	Ties	70,021	56,379		56,379		44.63 (D-1)	25,162	25,162
214	Rails	5,433	4,661		4,661		44.63 (D-1)	2,080	2,080
216	Other Track Material	23,218	20,097		20,097		44.63 (D-1)	8,969	8,969
218	Ballast	3,035	2,976		2,976		44.63 (D-1)	1,328	1,328
220	Track Laying and Surfacing	180,349	145,613		145,613		44.63 (D-1)	64,987	64,987
221	Right-of-Way Fences	6,928	6,081		6,081		44.63 (D-1)	2,714	2,714
223	Snow and Sand Fences and Snow Sheds	432	198		198		44.63 (D-1)	88	88
225	Crossings and Signs	1,667	904		904		44.63 (D-1)	403	403
227	Station and Office Buildings	9,724	9,069	789	4,278		44.63 (D-1)	1,909	2,698
229	Roadway Buildings	2,571	2,515		2,515		44.63 (D-1)	1,122	1,122
231	Water Stations	8,294	7,663			7,663	31.22 (D-16)	2,392	2,392
233	Fuel Stations	2,426	2,419			2,419	31.22 (D-16)	755	755
235	Shops and Enginehouse	20,314	20,147			20,147	(D-17)	6,123	6,123
241	Wharves and Docks	1,316	1,316	131					131
243	Coal and Ore Wharves	12,812	12,812						
244	Coal and Ore Wharves—Depreciation	19,146	19,146						
247	Telegraph and Telephone Lines	3,487	3,032		3,032		44.63 (D-1)	1,353	1,353
249	Signal and Interlockers	279	178		178		44.63 (D-1)	79	79
265	Miscellaneous Structures	140	140		140		44.63 (D-1)	62	62
269	Roadway Machines	1,776	1,487			1,487	41.83 (D-2)	622	622
271	Small Tools and Supplies	6,416	5,373			5,373	41.83 (D-2)	2,248	2,248
272	Removing Snow, Ice and Sand	42,980	38,075		38,075		44.63 (D-1)	16,993	16,993
274	Injuries to Persons	1,407	823		726		44.63 (D-1)	324	324
275	Insurance	4,299	3,830	120		2,610	(D-18)	985	1,114
276	Stationery and Printing	1,109	929			929	41.83 (D-2)	389	389
277	Other Expenses	244	204			204	41.83 (D-2)	85	85
278	Maint'g Jt. Trks., Yds. and Other Facilities—Dr.	13,434	8,402	858	32		44.63 (D-1)	14	872
279	Maint'g Jt. Trks., Yds. and Other Facilities—Cr.	13,818	13,818	3,983	6,606		44.63	2,948	6,931
		$582,103	485,133	2,076				193,234	$191,158
	Changes made by allocating cost of exclusive freight tracks—Deduct								15,520
		$582,103	485,133						$175,638

COMPLAINANT'S EXHIBIT 208

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of { The Total Operating Expenses. / The Operating Expenses in Michigan. / The Passenger Operating Expenses in Michigan.

Year Ended June 30, 1916.

Acct. No.		Operating Expenses Entire Line	Operating Expenses Michigan	Michigan Operating Expenses			Passenger Proportion of Common		Total Mich. Passenger Operating Expenses
				Assigned to Pass.	Common (1)	Common (2)	%	Amount	
	Maintenance of Equipment:								
301	Superintendence	$ 12,673	10,771			10,771	28.29 (D-4)	3,047	$ 3,047
302	Shop Machinery	8,784	7,466			7,466	28.29 (D-4)	2,112	2,112
308	Steam Locomotive—Repairs	102,989	87,830	31,160					31,160
309	Steam Locomotives—Depreciation	23,012	19,653	5,949					5,949
310	Steam Locomotive—Retirements	832	809	22		845	(D-20)	25	47
314	Freight Train Cars—Repairs	139,181	119,806						
315	Freight Train Cars—Depreciation	60,752	52,292						
316	Freight Train Cars—Retirements	4,349	3,742						
317	Passenger Train Cars—Repairs	46,155	37,489	37,489					37,489
318	Passenger Train Cars—Depreciation	12,367	9,963	9,963					9,963
326	Work Equipment—Repairs 8.63% Excl. Frt	6,599	5,526		5,049		44.63 (D-1)	2,253	2,253
327	Work Equipment—Depreciation 8.63% Excl. Frt	3,483	2,917		2,665		44.63 (D-1)	1,189	1,189
328	Work Equipment—Retirements 8.63% Excl. Frt	8	7	6			44.63 (D-1)	3	3
332	Injuries to Persons	4,325	3,718	71		217	28.29 (D-4)	61	132
333	Insurance	2,417	2,147	291		825	(D-19)	233	524
334	Stationery and Printing	1,316	1,118			1,118	28.29 (D-4)	316	316
336	Maint'g Jt. Equip. at Terminals—Dr.	792	15			15	44.63 (D-1)	7	7
		$430,018	365,255	84,945				9,240	$ 94,185
	Traffic Expenses:								
351	Superintendence	$ 31,604	26,123	11,580					$ 11,580
352	Outside Agencies	35,100	29,005	14,211					14,211
353	Advertising	4,078	3,363	3,319					3,319
354	Traffic Associations	278	230						
356	Industrial and Immigration Bureaus	8,464	7,477			7,477	(D-5)	2,206	2,206
357	Insurance	113	59	59					59
358	Stationery and Printing	9,385	7,758	3,138					3,138
355	Fast Freight Lines	10	8						
		$ 89,012	74,007	32,307		7,477		2,206	$ 34,513

COMPLAINANT'S EXHIBIT 208

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of { The Total Operating Expenses. / The Operating Expenses in Michigan / The Passenger Operating Expenses in Michigan. }

Year Ended June 30, 1916.

Acct. No.		Operating Expenses Entire Line	Operating Expenses Michigan	Michigan Operating Expenses: Assigned to Pass.	Common (1)	Common (2)	Passenger Proportion of Common: %	Passenger Proportion of Common: Amount	Total Michigan Passenger Operating Expenses
	Transportation—Rail Line:								
371	Superintendence	$ 20,755	17,907			17,907	(D-8)	4,834	$ 4,834
372	Dispatching Trains	12,804	10,648			10,648	39.76 (D-6)	4,234	4,234
373	Station Employes	150,423	141,572	11,955		69,457	39.76 (D-6)	27,616	39,571
374	Weighing, Inspection and Demurrage Bureaus	2,033	1,683						
375	Coal and Ore Wharves	25,323	25,323						
376	Station Supplies and Expenses	10,710	9,751	1,332		5,470	39.76 (D-6)	2,175	3,507
377	Yard Masters and Yard Clerks	4,743	4,743			4,743	(D-15)	99	99
378	Yard Conductors and Brakemen	48,036	46,858			46,858	(D-15)	1,174	1,174
379	Yard Switch and Signal Tenders	4,209	4,198			4,198	(D-15)	132	132
380	Yard Enginemen	34,640	33,645			33,645	(D-15)	845	845
382	Fuel for Yard Locomotives	29,504	28,289			28,289	(D-15)	717	717
385	Water for Yard Locomotives	1,821	1,731			1,731	(D-15)	50	50
386	Lubricants for Yard Locomotives	581	569			569	(D-15)	10	10
387	Other Supplies for Yd. Locomotives	433	426			426	(D-15)	7	7
388	Enginehouse Expenses—Yard	15,814	15,489			15,489	(D-10)	332	332
389	Yard Supplies and Expenses	1,387	1,360			1,360	(D-15)	45	45
390	Operating Jt. Yds. and Terminals—Dr.	25,994	17,212	6,199					6,199
391	Operating Jt. Yds. and Terminals—Cr.	13,477	13,477	1,748					1,748
392	Train Enginemen	174,317	146,769	61,069					61,069
394	Fuel for Train Locomotives	301,342	251,254	86,546					86,546
397	Water for Train Locomotives	14,354	11,968	4,122					4,122
398	Lubricants for Train Locomotives	5,615	4,960	1,927					1,927
399	Other Supplies for Train Locomotives	2,667	2,222	766					766
400	Enginehouse Expenses—Train	45,259	39,329	16,398					16,398
401	Trainmen	201,769	168,967	53,065					53,065
402	Train Supplies and Expenses	34,399	28,620	22,163					22,163
403	Operating Sleeping Cars	13,954	10,566	10,566					10,566
404	Signal and Interlocker Operation	1,540	311		311		44.63 (D-1)	139	139
405	Crossing Protection	8,639	8,159			8,159	5.24	428	428
407	Telegraph and Telephone Operation	174	174			174	39.76 (D-6)	69	69
410	Stationery and Printing	12,105	10,444	2,437		3,116	30.43 (D-7)	948	3,385
411	Other Expenses	1,214	997	16		194	30.43 (D-7)	59	75
412	Operating Jt. Trks. and Facilities—Dr.	4,502	1,083	76		68	39.76 (D-6)	27	103
413	Operating Jt. Trks. and Facilities—Cr.	4,928	3,479	755		644	(D-13)	246	1,001
414	Insurance	1,827	1,443	67		542	30.43 (D-7)	165	232
415	Clearing Wrecks	1,151	1,065	270					270
416	Damage to Property	599	594			212	39.76 (D-6)	84	84
417	Damage to Live Stock on Rt.-of-Way	422	400	322		3	39.76 (D-6)	1	323
418	Loss and Damage—Freight	6,971	5,773						
419	Loss and Damage—Baggage	155	138	138					138
420	Injuries to Persons	10,618	6,916	1,574		938	39.76 (D-6)	373	1,947
		$1,223,398	1,046,600	278,505				44,317	$322,822

COMPLAINANT'S EXHIBIT 208

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of { The Total Operating Expenses. / The Operating Expenses in Michigan. / The Passenger Operating Expenses in Michigan.

Year Ended June 30, 1916.

Acct. No.		Operating Expenses Entire Line	Operating Expenses Michigan	Michigan Operating Expenses			Passenger Proportion of Common		Total Michigan Passenger Operating Expenses
				Assigned to Pass.	Common (1)	Common (2)	%	Amount	
	Miscellaneous Operations:								
441	Dining and Buffet Service	$ 43,984	35,899	35,899					$ 35,899
	General Expenses:								
451	Salaries and Expenses of General Officers	$ 25,342	21,472			21,472	33.04 (D-14)	7,094	7,094
452	Salaries and Expenses of Clerks and Attendants	37,898	32,111	5,628		16,247	33.04 (D-14)	5,368	10,996
453	Gen. Office Supplies and Expenses	4,070	3,449			3,449	33.04 (D-14)	1,140	1,140
454	Law Expenses—Cost of Suit..$ 9,676 Other,..... 10,230	10,230	8,826	923		7,693	33.04 (D-14)	2,542	3,465
455	Insurance	143	121			121	33.04 (D-14)	40	40
457	Pensions	4,020	3,406			3,406	33.04 (D-14)	1,125	1,125
458	Stationery and Printing	5,005	4,241	119		3,792	33.04 (D-14)	1,253	1,372
459	Valuation Expenses	12,034	10,010			10,010	33.04 (D-14)	3,307	3,307
460	Other Expenses	4,756	4,030			4,030	33.04 (D-14)	1,332	1,332
461	General Jt. Facilities—Dr	456	62	17					17
		$ 103,953	87,728	6,687				23,201	$ 29,888
	SUMMARY								
	Maintenance of Way and Structures	582,103	485,133						$ 175,638
	Maint. of Equipment	430,018	365,255						94,185
	Traffic Expenses	89,012	74,007						34,513
	Transportation Expenses	1,223,398	1,046,600						322,822
	Miscellaneous Operations	43,984	35,899						35,899
	General Expenses	103,953	87,728						29,888
	Total	$2,472,468	2,094,622						$ 692,945

COMPLAINANT'S EXHIBIT 208

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Passenger Business in Michigan—Year ended June 30th, 1916.

	Total Michigan	Intrastate	Interstate
Passenger Revenue (Intra. 70.6% Actually located)	$ 770,755	$ 544,181	$ 226,574
Excess Baggage (Intra. 70.6% Intra. and Inter. Actually located)	7,482	4,621	2,861
Mail Revenue (Intra. 70.6% Rev. Basis)	58,203	41,091	17,112
Express Revenue (Intra. 70.6% Rev. Basis)	27,818	19,640	8,178
Milk Rev. on Pass. Trains (All Intrastate)	101	101	.....
Other Pass. Train Revenue	906	606	300
Special Train Revenue	1,612	1,579	33
Station and Train Privileges (Intra. 70.6% Rev. Basis)	495	349	146
Parcel Room Receipts (Intra. 70.6% Rev. Basis)	523	369	154
Storage-Baggage (Intra. 70.6% Rev. Basis)	82	58	24
Telegraph and Telephone Rev. (Intra. 70.6% Rev. Basis)	181	128	53
Rent of Bldgs. and Other Property (Intra. 70.6% Rev. Basis)	531	375	156
Joint Facility Rev. (Balance)	1,112	630	482
Miscellaneous Revenue (Intra. 70.6% Rev. Basis)	677	478	199
Sleeping Car Revenue (Intra. 32.39% Actually located)	30,390	9,842	20,548
Dining Car Revenue (Intra. 70.6% Rev. Basis)	27,939	19,725	8,214
Chair Car Revenue (Intra. 70.6% Rev. Basis)	4,489	3,169	1,320
Rents Received:			
For Hire of Equipment (Intra. 70.6% Rev. Basis)	3,028	2,138	890
For Joint Facilities (Intra. 70.6% Rev. Basis)	13,582	9,599	3,983
Interest (Intra. 70.6% Rev. Basis)	2,315	1,634	681
Total Income	$ 952,221	$ 660,313	$ 291,908
Operating Expenses, Michigan	$ 692,945	$ 480,618	$ 212,327
Rents Paid for Hire of Equipment (Intra. 70.6% Rev. Basis)	1,695	1,197	498
Rents Paid for Joint Facilities	1,966	1,148	818
Miscellaneous Interest (Intra. 70.6% Rev. Basis)	2	1	1
Taxes on Sleeping Car Tickets	168	51	117
Taxes on Observation Car Tickets	90	64	26
Taxes paid State of Michigan—Total $203,642—Pass	62,359	44,156	18,203
	$ 759,225	$527,235	$ 231,990
Net	$ 192,996	$133,078	$ 59,918
Less estimated Loss by Application of Act 276	176,641	125,890	50,751
	16,355	7,188	9,167
Less Mail and Express	15,426	11,316	4,110
	$ 929	Loss $ 4,128	$ 5,057

COMPLAINANT'S EXHIBIT 209

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of { The Total Operating Expenses. / The Operating Expenses in Michigan. / The Passenger Operating Expenses in Michigan.

Year Ended June 30, 1917.

Acct. No.		Operating Expenses Entire Line	Operating Expenses Michigan	Michigan Operating Expenses			Passenger Proportion of Common		Total Mich. Passenger Operating Expenses
				Assigned to Pass.	Common (1)	Common (2)	%	Amount	
	Maintenance of Way and Structures:								
201	Superintendence	$ 27,129	21,657			21,657	36.07 (D-2)	7,811	$ 7,811
202	Roadway Maintenance	67,154	51,501	80	48,289		42.21 (D-1)	20,383	20,463
208	Bridges, Trestles and Culverts	56,221	17,621	.....	16,798		42.21 (D-1)	7,275	7,275
212	Ties	78,794	60,335	106	51,335		42.21 (D-1)	21,669	21,775
214	Rails	35,448	34,075		33,758		42.21 (D-1)	14,249	14,249
216	Other Track Material	36,880	30,616	450	25,473		42.21 (D-1)	10,752	11,202
218	Ballast	15,604	14,838		14,726		42.21 (D-1)	6,216	6,216
220	Track Laying and Surfacing	264,791	218,853	157	197,157		42.21 (D-1)	83,220	83,377
221	Right-of-Way Fences	7,515	5,790		5,714		42.21 (D-1)	2,412	2,412
223	Snow and Sand Fences and Snow Sheds	796	757		718		42.21 (D-1)	303	303
225	Crossings and Signs	2,911	2,583		1,711		42.21 (D-1)	722	722
227	Station and Office Buildings	12,750	11,933	1,764	4,541		42.21 (D-1)	1,917	3,681
229	Roadway Buildings	6,363	6,197		6,197		42.21 (D-1)	2,616	2,616
231	Water Stations	6,834	5,601			5,601	29.62 (D-16)	1,659	1,659
233	Fuel Stations	8,542	8,499			8,499	29.62 (D-16)	2,517	2,517
235	Shops and Enginehouses	7,620	6,921			6,921	(D-17)	1,970	1,970
241	Wharves and Docks	2,878	2,878	1,113					1,113
243	Coal and Ore Wharves	17,285	17,285						
244	Coal and Ore Wharves—Depreciation	19,146	19,146						
247	Telegraph and Telephone Lines	6,053	4,707		4,707		42.21 (D-1)	1,987	1,987
249	Signal and Interlockers	1,382	687		687		42.21 (D-1)	290	290
265	Miscellaneous Structures	58	58		52		42.21 (D-1)	22	22
269	Roadway Machines	2,216	1,993			1,993	36.07 (D-2)	719	719
271	Small Tools and Supplies	9,223	7,767			7,767	36.07 (D-2)	2,802	2,802
272	Removing Snow, Ice and Sand	49,937	45,184	452	31,629		42.21 (D-1)	13,351	13,803
274	Injuries to Persons	2,472	2,202			2,028	36.07 (D-2)	731	731
275	Insurance	4,235	3,757	128		2,351	(D-18)	845	973
276	Stationery and Printing	972	776			776	36.07 (D-2)	280	280
277	Other Expenses	130	120			120	36.07 (D-2)	43	43
278	Maint'g Jt. Trks., Yds. and other Facilities—Dr.	8,903	7,259	317	112		42.21 (D-1)	47	364
279	Maint'g Jt. Trks., Yds. and other Facilities—Cr.	16,373	16,214	4,022	5,092		42.21 (D-1)	2,149	6,171
		743,950	595,391	1,045				204,659	205,704

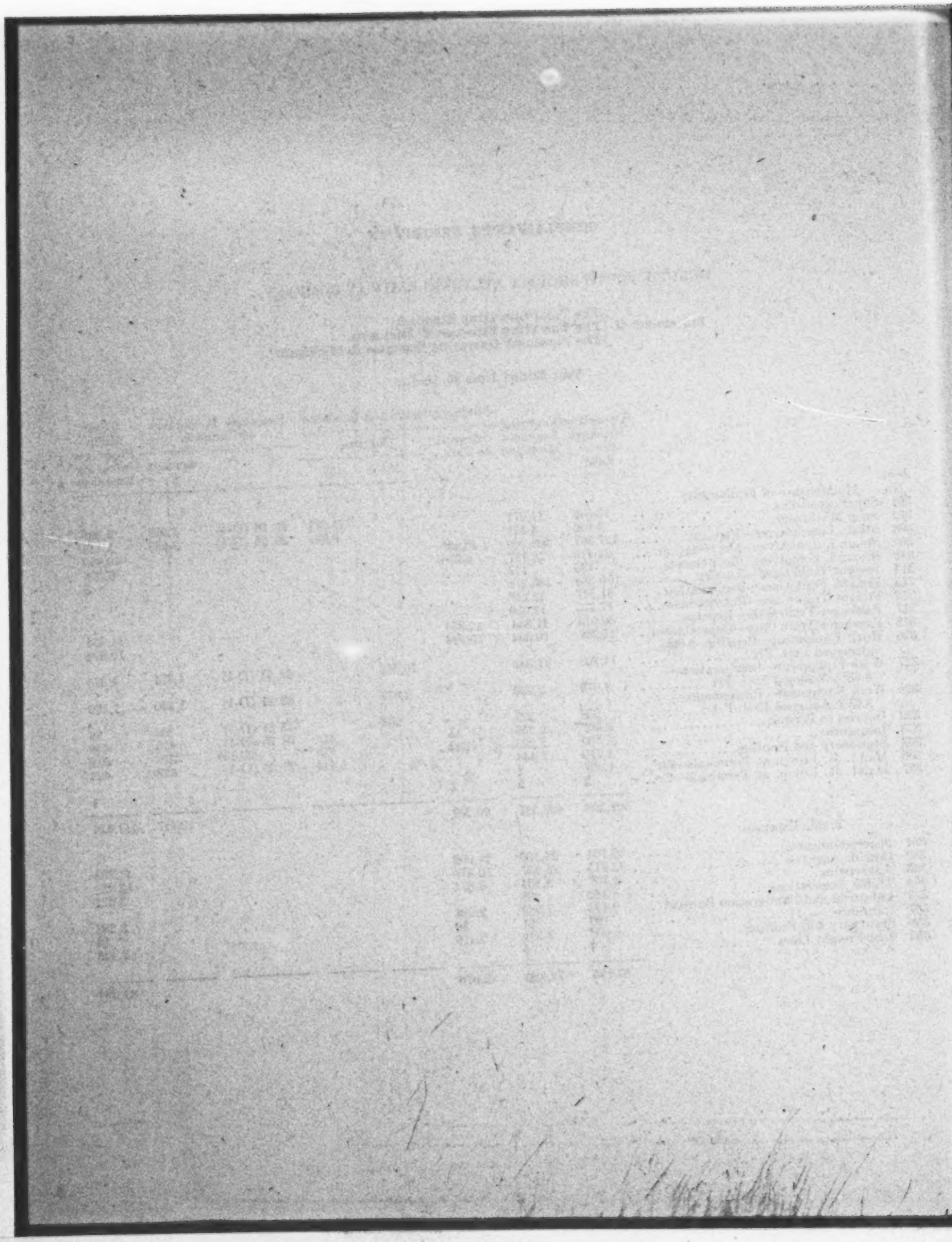
COMPLAINANT'S EXHIBIT 209

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of { **The Total Operating Expenses.** / **The Operating Expenses in Michigan.** / **The Passenger Operating Expenses in Michigan.**

Year Ended June 30, 1917.

Acct. No.		Operating Expenses Entire Line	Operating Expenses Michigan	Michigan Operating Expenses			Passenger Proportion of Common		Total Mich. Passenger Operating Expenses
				Assigned to Pass.	Common (1)	Common (2)	%	Amount	
	Maintenance of Equipment:								
301	Superintendence	13,349	11,271			11,271	29.26 (D-4)	3,298	3,298
302	Shop Machinery	9,856	8,321			8,321	29.26 (D-4)	2,435	2,435
308	Steam Locomotives—Repairs	127,367	108,260	40,880					40,880
309	Steam Locomotives—Depreciation	22,413	19,117	6,076					6,076
310	Steam Locomotives—Retirements	136	117	5					5
314	Freight Train Cars—Repairs	160,384	136,214						
315	Freight Train Cars—Depreciation	61,517	52,247						
316	Freight Train Cars—Retirements	17,233	14,636						
317	Passenger Train Cars—Repairs	50,613	41,854	41,854					41,854
318	Passenger Train Cars—Depreciation	12,367	10,094	10,094					10,094
326	Work Equipment—Repairs—8.63% Assigned Excl. Frt	14,208	11,342		10,363		42.21 (D-1)	4,374	4,374
327	Work Equipment—Depreciation—8.63% Assigned Excl. Frt	3,670	2,030		2,677		42.21 (D-1)	1,130	1,130
328	Work Equipment—Retirements—8.63% Assigned Excl. Frt	278	222		203		42.21 (D-1)	86	86
332	Injuries to Persons	2,667	2,256	15		1,515	29.26 (D-4)	443	458
333	Insurance	2,500	2,223	284		779	(D-19)	228	512
334	Stationery and Printing	1,710	1,444			1,444	29.26 (D-4)	423	423
336	Maint. Jt. Equip. at Terminals—Dr.	1,997	1						
337	Maint. Jt. Equip. at Terminals—Cr.	2	2	1					1
		502,263	422,547	99,207				12,417	111,624
	Traffic Expenses:								
351	Superintendence	32,164	26,500	11,698					11,698
352	Outside Agencies	32,715	26,957	12,553					12,553
353	Advertising	3,757	3,104	3,071					3,071
354	Traffic Associations	362	298						
356	Industrial and Immigration Bureaus	9,128	7,983	2,288					2,288
357	Insurance	109	51	50					50
358	Stationery and Printing	8,903	7,331	2,416					2,416
355	Fast Freight Lines	7	6						
		87,145	72,230	32,076					32,076



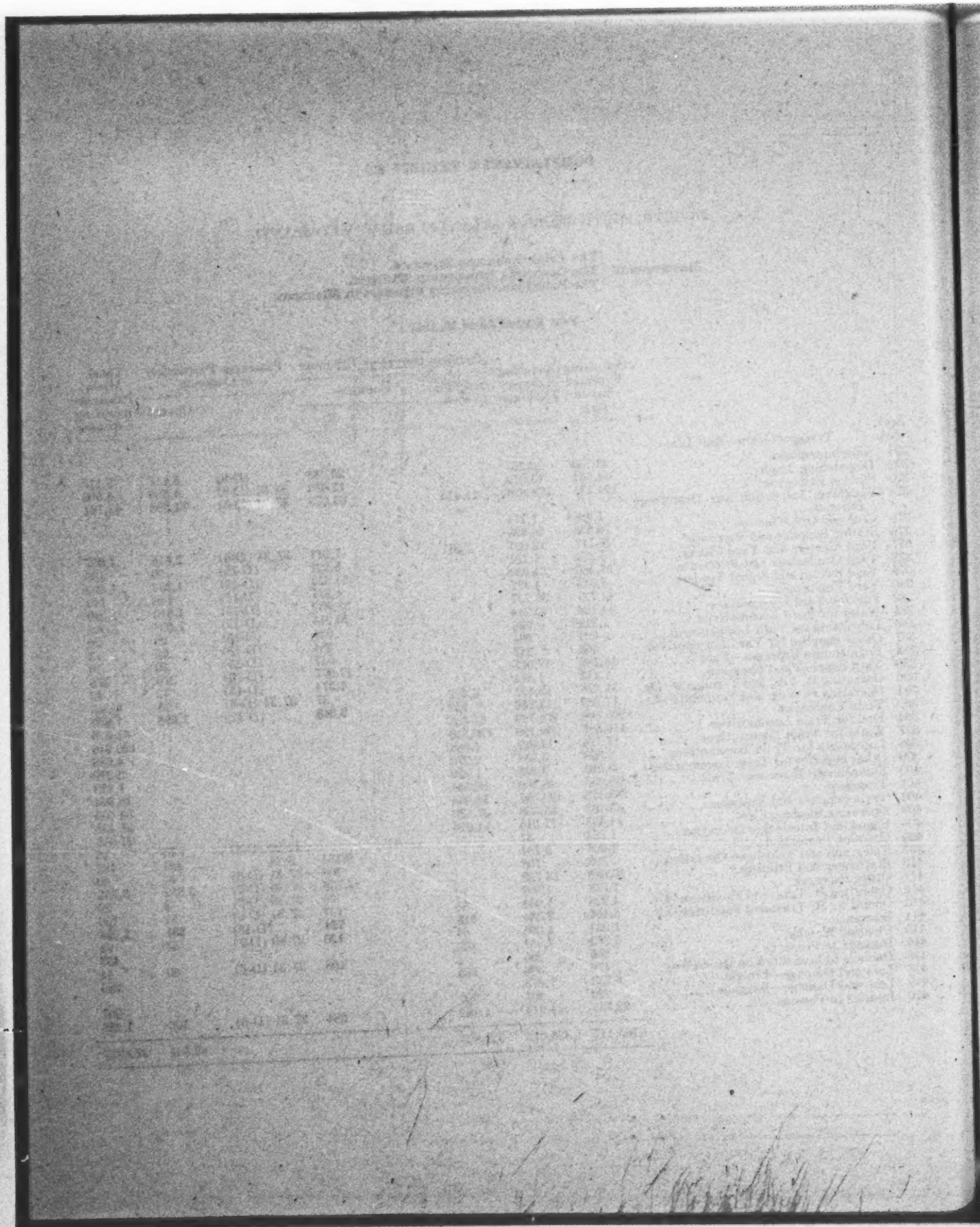
COMPLAINANT'S EXHIBIT 209

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of { **The Total Operating Expenses.**
The Operating Expenses in Michigan.
The Passenger Operating Expenses in Michigan.

Year Ended June 30, 1917.

Acct. No.	Transportation—Rail Line	Operating Expenses Entire Line	Operating Expenses Michigan	Michigan Operating Expenses: Assigned to Pass.	Common (1)	Common (2)	Passenger Proportion of Common: %	Passenger Proportion of Common: Amount	Total Mich. Passenger Operating Expenses
371	Superintendence	23,736	20,253			20,253	(D-8)	5,117	5,117
372	Dispatching Trains	14,584	12,076			12,076	37.31 (D-6)	4,506	4,506
373	Station Employes	194,131	174,816	11,413		84,073	37.31 (D-6)	31,368	42,781
374	Weighing, Inspection and Demurrage Bureaus	1,428	1,174						
375	Coal and Ore Wharves	26,636	26,636						
376	Station Supplies and Expenses	13,117	12,021	1,441		7,011	37.31 (D-6)	2,616	4,057
377	Yard Masters and Yard Clerks	5,221	5,221			5,221	(D-15)	106	106
378	Yard Conductors and Brakemen	58,460	54,633			54,633	(D-15)	1,392	1,392
379	Yard Switch and Signal Tenders	4,915	4,877			4,877	(D-15)	146	146
380	Yard Enginemen	41,721	38,737			38,737	(D-15)	1,010	1,010
382	Fuel for Yard Locomotives	44,126	40,214			40,214	(D-15)	1,068	1,068
385	Water for Yard Locomotives	1,218	936			936	(D-15)	26	26
386	Lubricants for Yard Locomotives	621	564			564	(D-15)	13	13
387	Other Supplies for Yard Locomotives	568	547			547	(D-15)	10	10
388	Enginehouse Expenses—Yard	18,788	17,977			17,977	(D-15)	376	376
389	Yard Supplies and Expenses	1,443	1,374			1,374	(D-15)	42	42
390	Operating Jt. Yds. and Terminals—Dr.	31,426	19,421	6,527		37	37.31 (D-6)	13	6,540
391	Operating Jt. Yds. and Terminals—Cr.	17,280	17,280	222		3,848	(D-12)	1,598	1,820
392	Train Enginemen	205,500	174,789	61,628					61,628
394	Fuel for Train Locomotives	440,587	369,290	120,246					120,246
397	Water for Train Locomotives	17,176	14,397	4,688					4,688
398	Lubricants for Train Locomotives	6,898	5,781	2,270					2,270
399	Other Supplies for Train Locomotives	3,936	3,299	1,229					1,229
400	Enginehouse Expenses—Train	55,955	48,306	18,364					18,364
401	Trainmen	235,476	198,387	54,666					54,666
402	Train Supplies and Expenses	42,403	35,328	27,136					27,136
403	Operating Sleeping Cars	14,455	11,016	11,016					11,016
404	Signal and Interlocker Operation	1,364	31		31		42.21 (D-1)	13	13
405	Crossing Protection	9,664	9,184			9,184	5.24	481	481
407	Telegraph and Telephone Operation	108	108			108	37.31 (D-6)	40	40
410	Stationery and Printing	16,086	13,739			13,739	27.89 (D-7)	3,832	3,832
411	Other Expenses	1,778	1,509	12		29	27.89 (D-7)	8	20
412	Operating Jt. Trks. and Facilities—Dr.	4,228	1,041	55		137	37.31 (D-6)	51	106
413	Operating Jt. Trks. and Facilities—Cr.	5,464	3,884	813		784	(D-13)	281	1,094
414	Insurance	1,251	1,095	66		120	27.89 (D-7)	33	99
415	Clearing Wrecks	5,785	3,951	433					433
416	Damage to Property	265	265	4		108	37.31 (D-6)	40	44
417	Damage to Live Stock on Rt.-of-Way	479	389	285					285
418	Loss and Damage—Freight	9,333	7,673						
419	Loss and Damage—Baggage	220	207	207					207
420	Injuries to Persons	32,765	14,914	1,152		284	37.31 (D-6)	106	1,258
		1,565,117	1,325,012	321,803				50,534	372,337



COMPLAINANT'S EXHIBIT 209

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Statement of { **The Total Operating Expenses.** / **The Operating Expenses in Michigan.** / **The Passenger Operating Expenses in Michigan.**

Year Ended June 30, 1917.

Acct. No.		Operating Expenses Entire Line	Operating Expenses Michigan	Michigan Operating Expenses Assigned to Pass.	Common (1)	Common (2)	Passenger Proportion of Common %	Passenger Proportion of Common Amount	Total Mich. Passenger Operating Expenses
	Miscellaneous Operations:								
441	Dining and Buffet Service	50,588	41,319	41,319					41,319
	General Expenses:								
451	Salaries and Expenses of General Officers	30,367	25,296			25,296	31.06 (D-14)	7,857	7,857
452	Salaries and Expenses of Clerks and Attendants	35,612	29,665	5,892		13,655	31.06 (D-14)	4,241	10,133
453	Gen. Office Supplies and Expenses	4,276	3,562			3,562	31.06 (D-14)	1,106	1,106
454	Law Expenses—Cost of Suit.. 4,645 Other 11,109	11,109	9,213	702		8,357	31.06 (D-14)	2,596	3,298
455	Insurance	117	97			97	31.06 (D-14)	30	30
457	Pensions	1,367	1,139			1,139	31.06 (D-14)	354	354
458	Stationery and Printing	6,712	5,591	228		4,818	31.06 (D-14)	1,496	1,724
459	Valuation Expenses	6,701	5,563			5,563	31.06 (D-14)	1,728	1,728
460	Other Expenses	5,446	4,489	95		4,242	31.06 (D-14)	1,318	1,413
461	General Joint Facilities—Dr	556	78	18					18
		102,263	84,693	6,935				20,726	27,661
	SUMMARY								
	Maint. of Way and Structures	743,950	595,391						205,704
	Maint. of Equipment	502,263	422,547						111,624
	Traffic Expenses	87,145	72,230						32,076
	Transportation Expenses	1,565,117	1,325,012						372,337
	Miscellaneous Operations	50,588	41,319						41,319
	General Expenses	102,263	84,693						27,661
	Total	3,051,335	2,541,192						790,721

COMPLAINANT'S EXHIBIT 209

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Passenger Business in Michigan—Year ended June 30th, 1917.

	Total Michigan	Intrastate	Interstate
Passenger Revenue (Intra. 69.87%. Actually located)	$ 887,421	$ 620,072	$ 267,349
Excess Baggage (Intra. and Inter. Actually located)	7,095	5,209	1,886
Mail Revenue (Intra. 69.87% Rev. Basis)	40,478	28,282	12,196
Express Revenue (Intra. 69.87% Rev. Basis)	33,995	23,752	10,243
Milk Rev. on Pass. Trains (All Intrastate)	194	194	.....
Other Pass. Train Revenue	1,601	885	716
Special Train Revenue	2,174	1,681	493
Station and Train Privileges (Intra. 69.87% Rev. Basis)	495	346	149
Parcel Room Receipts (Intra. 69.87% Rev. Basis)	464	324	140
Storage-Baggage (Intra. 69.87% Rev. Basis)	164	115	49
Telegraph and Telephone Rev. (Intra. 69.87% Rev. Basis)	226	158	68
Rents of Bldgs. and Other Prop. (Intra. 69.87% Rev. Basis)	489	342	147
Joint Facility Rev. (Balance)	1,031	670	361
Miscellaneous Revenue (Intra. 69.87% Rev. Basis)	588	411	177
Sleeping Car Revenue (Intra. 37.23% Actually located)	34,148	12,712	21,436
Dining Car Revenue (Intra. 69.87% Rev. Basis)	31,865	22,264	9,601
Chair Car Revenue (Intra. 69.87% Rev. Basis)	4,706	3,288	1,418
Rents Received:			
For Hire of Equipment (Intra. 69.87% Rev. Basis)	2,783	1,945	838
For Joint Facilities (Intra. 69.87% Rev. Basis)	13,164	9,198	3,966
Interest (Intra. 69.87% Rev. Basis)	1,719	1,201	518
Total Income	$1,064,800	$ 733,049	$ 331,751
Operating Expenses, Michigan	$ 790,721	$ 551,782	$ 238,939
Rents paid for Hire of Equipment (Intra. 69.87% Rev. Basis)	1,666	1,165	501
Rents paid for Joint Facilities	1,665	876	789
Miscellaneous Interest (Intra. 69.87% Rev. Basis)	4	3	1
Taxes on Sleeping Car Tickets	48	18	30
Taxes on Observation Car Tickets	26	18	8
Taxes paid the State of Michigan	58,203	41,132	17,071
	$ 852,333	$ 594,994	$ 257,339
Net Income	$ 212,467	$ 138,055	$ 74,412
Less estimated Loss by application of Act 276	$ 218,234	$ 149,743	$ 68,496
	$ 5,767	$ 11,688	$ 5,926
Less Mail and Express	$ 6,159	$ 4,632	$ 1,527
	$ 392	Loss $ 7,061	$ 7,453

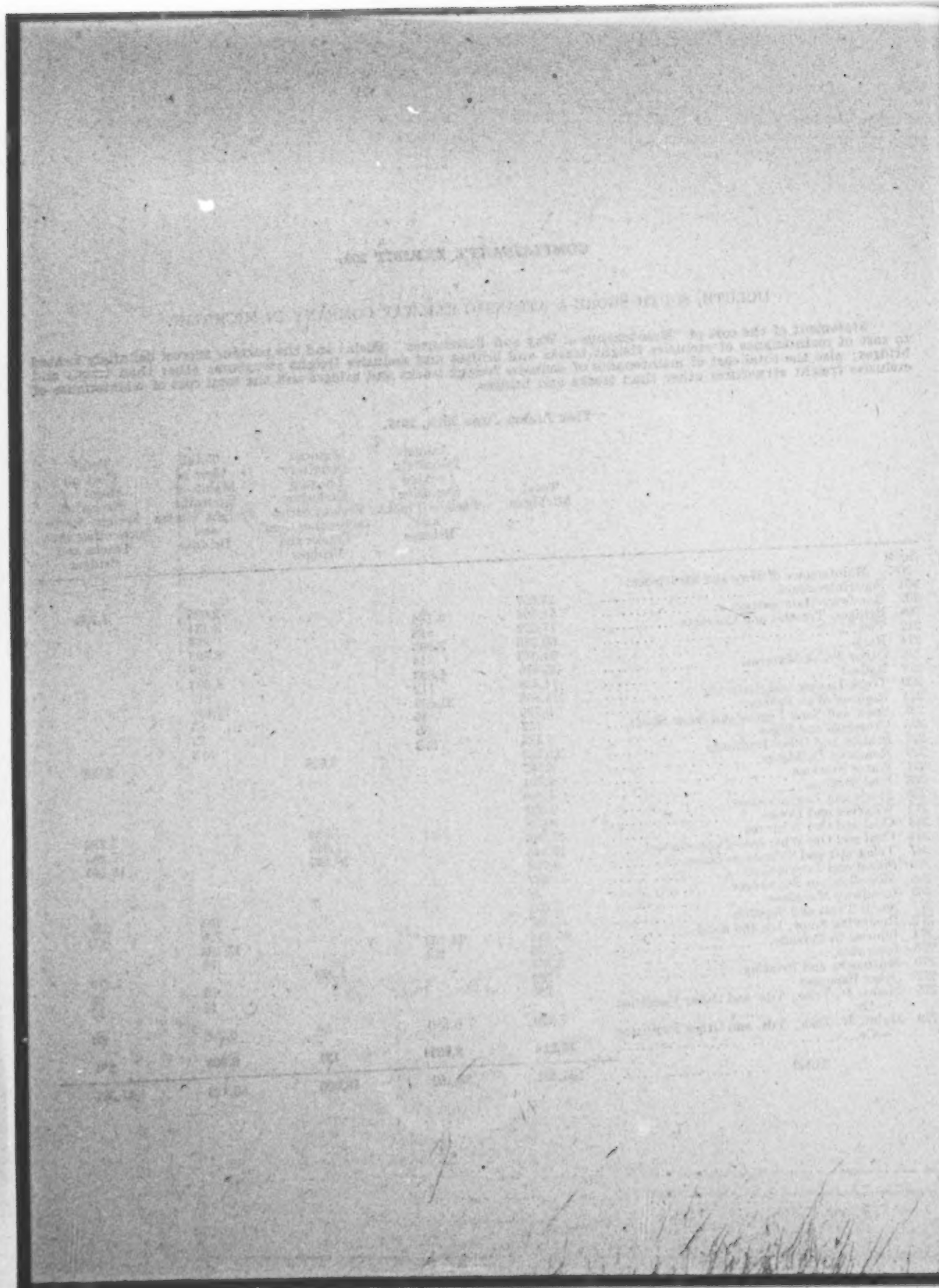
COMPLAINANT'S EXHIBIT 209

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY IN MICHIGAN.

Statement of the cost of "Maintenance of Way and Structures" (Mich.) and the portion thereof definitely located to cost of maintenance of exclusive freight tracks and bridges and exclusive freight structures other than tracks and bridges; also the total cost of maintenance of exclusive freight tracks and bridges and the total cost of maintenance of exclusive freight structures other than tracks and bridges.

Year Ended June 30th, 1917.

Acct. No.		Total Michigan	Amount Definitely Located Exclusive Freight Tracks and Bridges	Amount Definitely Located Exclusive Freight Structures other than Tracks and Bridges	Total Cost of Maint. of Exclusive Freight Tracks and Bridges	Total Cost of Maint. of Exclusive Freight Structures other than Tracks and Bridges
	Maintenance of Way and Structures:					
201	Superintendence	21,657			2,025	1,730
202	Roadway Maintenance	51,501	3,134		3,134	
208	Bridges, Trestles and Culverts	17,621	828		828	
212	Ties	60,335	8,893		8,893	
214	Rails	34,075	318		318	
216	Other Track Material	30,616	4,693		4,693	
218	Ballast	14,838	112		112	
220	Track Laying and Surfacing	218,853	21,539		21,539	
221	Right-of-Way Fences	5,799	85		85	
223	Snow and Sand Fences and Snow Sheds	757	39		39	
225	Crossings and Signs	2,583	873		873	
227	Station and Office Buildings	11,933		5,628		5,628
229	Roadway Buildings	6,197				
231	Water Stations	5,601				
233	Fuel Stations	8,499				
235	Shops and Enginehouses	6,921				
241	Wharves and Docks	2,878		1,736		1,736
243	Coal and Ore Wharves	17,285		17,285		17,285
244	Coal and Ore Wharves—Depreciation	19,146		19,146		19,146
247	Telegraph and Telephone Lines	4,707				
249	Signal and Interlockers	687				
265	Miscellaneous Structures	58		7		7
269	Roadway Machines	1,993			186	159
271	Small Tools and Supplies	7,767			726	620
272	Removing Snow, Ice and Sand	45,184	13,103		13,103	
274	Injuries to Persons	2,202	174		174	
275	Insurance	3,757		1,279		1,279
276	Stationery and Printing	776			73	62
277	Other Expenses	120			11	10
278	Maint. Jt. Trks., Yds. and Other Facilities —Dr.	7,259	6,280	50	6,280	50
279	Maint. Jt. Trks., Yds. and Other Facilities —Cr.	16,214	6,969	131	6,969	131
	Total	595,391	53,102	45,000	56,123	47,581



COMPLAINANT'S EXHIBIT 209

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY CO. (MICH.)

Apportionment of Cost of Maintenance of Exclusive Freight Tracks in 1914, 1915 and 1916.

The apportionment is made on the Basis of the 1917 Allocations, Except Account No. 208, "Bridges, Trestles and Culverts," which for 1914 and 1915 is assigned on the basis of 1916 and 1917 Allocations.

Accounts 201, 209, 271, 276, 277 in 1915 and 1916 assigned overhead to Accounts 202, 208, 212, 214, 216, 218, 220, 221, 222, 225, 272, 274, 278 and 279.

Accounts 1, 15, 20 and 21 in 1914 assigned overhead to Accounts 2, 3, 4, 5, 6, 7, 9, 11, 12, 19, 22 and 23.

Account		1917 Except Acct. 208, which is 1916 and 1917	1916 Total Mich.	1916 Cost of Maint. of Excl. Frt. Tracks	1915 Total Mich.	1915 Cost of Maint. of Excl. Frt. Tracks		Account	1914 Total Mich.	1914 Cost of Maint. of Excl. Frt. Tracks
201 Superintendence.	Total Mich.	21,657								
	Excl. Frt...	2,025	20,643	1,781	17,362	1,359	1	Superintendence.....	19,283	1,624
202 Road Maint.....	Total Mich.	51,501—100%								
	Excl. Frt...	3,134— 6.09%	57,992	3,532	30,269	2,301				
208 Bridges, T. & C.	1916—45,887									
Total Mich.....	1917—17,621									
	1916— 1,940	63,508—100%								
Excl. Frt.....	1917—828...	2,768— 4.36%	45,887	1,940	30,368	1,716	9	Bridges, T. and C...	45,886	2,001
212 Ties.....	Total Mich.	60,335—100%								
	Excl. Frt...	8,893—14.74%	56,379	8,310	79,393	11,703	3	Ties.....	91,620	13,505
214 Rails.....	Total Mich.	34,075—100%								
	Excl. Frt...	318— 93%	4,661	43	19,782	184	4	Rails.....	48,268	449
216 Other Trk. Mat'l	Total Mich.	30,616—100%								
	Excl. Frt...	4,693—15.33%	20,097	3,081	21,806	3,343	5	Other Tk. Mat'l....	27,132	4,139
218 Ballast.....	Total Mich.	14,838—100%								
	Excl. Frt...	112— 75%	2,976	22	9,703	73	2	Ballast.....	20,198	151
220 Track, L. & S...	Total Mich.	218,853—100%								
	Excl. Frt...	21,539— 9.84%	145,613	14,328	145,548	14,322	6	Roadway and Trk...	276,353	*25,231
221 Rt. of W. Fences	Total Mich.	5,799—100%								
	Excl. Frt...	85— 1.47%	6,081	89	3,309	49	11	Grade Crossings, Fences, Cattle Gd's and Signs....	8,738	‡1,001
223 Snow and Sand Fences.....	Total Mich.	757—100%								
	Excl. Frt...	39— 5.15%	198	10	199	10	12	Snow and Sand Fences.....	1,021	53
225 Crossings and Signs.....	Total Mich.	2,583—100%								
	Excl. Frt...	873—33.79%	904	305	1,304	441				
265 Misc'l. Struc....	Total Mich.	58—100%								
	Excl. Frt...	7—12.06%	140	17						
272 Snow, Sand and Ice.....	Total Mich.	45,184—100%								
	Excl. Frt...	13,103— 29%	38,075	11,042	20,060	5,817	7	Remv. Snow, S. and Ice.....	18,450	5,351
274 Inj. to Persons..	Total Mich.	2,202—100%								
	Excl. Frt..	174— 7.9%	7,823	65	1,810	143	19	Inj. to Persons.....	2,734	216
269 Rdw. Maint.....		1,993								
		186	1,487	128	657	51				
271 Small Tools and Supplies.....		7,767								
		726	5,373	464	6,184	484	18	Rdw. Tools and Sup.	7,906	666
276 Stationery and Printing.....		776								
		73	929	80	554	43	20	Sta. and Ptg.....	708	60
277 Other Expenses.		120								
		11	204	18	82	6	21	Other Ex.....	139	11
278 Joint Facility—Dr.....		7,259								
		6,290	8,402	3,154	6,098	2,614	22	Jt. Fac.—Dr.....	8,138	3,178
279 Joint Facility—Cr.....		16,214								
		6,969	13,818	13,694	13,632	13,506	23	Jt. Fac.—Cr.....	10,188	9,926
Total.....			$403,046	$34,775	$332,856	$31,244			$566,438	$47,720
			100%	8.63%	100%	7.83%			100%	8.42%

	1917 Total Mich.	1917 Exclusive Frt.
Acct. 202	$ 51,501	$ 3,134
220	218,853	21,539
	$270,354	$24,673
	100%	9.13% *
Acct. 221	$ 5,799	85
225	2,583	873
	$ 8,382	$ 958
	100%	11.43% ‡

COMPLAINANT'S EXHIBIT 210

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Mich. Modified Revenue Train Miles. D-1

	1914		1915		1916		1917	
Total Frt. Train Switching Loco. Miles (Mich.)	126,878		96,820		120,775		145,490	
56.94% (of 126,878) on common tracks	72,244	Miles	55,129		68,769		82,842	
Mich. Rev. Frt. Train Miles	797,192		672,641		767,717		836,193	
Mich. Frt. Train Loco. Swchg. on common tracks	72,244		55,129		68,769		82,842	
Mich. Frt. Yard Loco Swchg. on common tracks	122,853		106,940		140,171		161,099	
Total Freight	992,289	54.91%	834,710	51.35%	976,657	55.37%	1,080,134	57.79%
Mich. Rev. Pass. Train Miles (Mileage of Trains Nos. 110, 111, 105, 106, not included)	779,623		754,165		751,454		751,803	
Mich. Pass. Train Loco. Swchg. on common tracks	2,248		2,220		2,202		2,214	
Mich. Pass. Yard Loco. Swchg. on common tracks	2,034		2,034		2,040		2,190	
	783,905		758,419		755,696		756,207	
Mileage of trains 110, 111, 105, 106	30,982		32,448		31,704		32,599	
Total Passenger	814,887	45.09%	790,867	48.65%	787,400	44.63%	788,806	42.21%

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

1914 D-2

M. of W. & S. Acct. No.		Mich.		Mich. Pass.
Total		$661,709		$272,354
Less 1	19,283		8,174	
17	19,146			
18	7,906		3,351	
19	2,734		1,149	
20	708		300	
21	139	49,916	59	13,033
		$611,793—100%		$259,321—42.39%

For assignment of "Com" in 1, 18, 19, 20, 21, to "Passenger" (42.39%).

1915 D-2

M. of W. & S. Acct. No.		Mich.		Mich. Pass.
Total		$444,634		$200,222
Less 201	17,362		8,301	
244	19,146			
269	657		314	
271	6,184		2,956	
274	1,810		853	
276	554		264	
277	82		39	
278	6,098		640	
279	13,632	38,261	7,445	5,922
		$406,373—100%		$194,300—47.81%

1916 D-2

M. of W. & S. Acct. No.		Mich.		Mich. Pass.
Total		$485,133		$191,158
Less 201	20,643		8,635	
244	19,146			
269	1,487		622	
271	5,373		2,248	
276	929		389	
277	204		85	
278	8,402		672	
279	13,818	42,366	6,931	5,920
		$442,767—100%		$185,238—41.83%

1917 D-2

M. of W. & S. Acct. No.		Mich.		Mich. Pass.
Total		$595,391		$205,704
Less 201	21,657		7,811	
244	19,146			
269	1,993		719	
271	7,767		2,802	
274	2,202		731	
276	776		280	
277	120		43	
278	7,259		864	
279	16,214	44,706	6,171	7,079
		$550,685—100%		$198,625—36.07%

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

1914 D-3

Acct. 16—Buildings, Fixtures and Grounds—Assignment to Michigan Passenger.

Mich.			Allocated Passenger	Frt.	Common	%		Passenger
16-A	Shops and Storehouses				1,269	28.54	(D-4)	362
16-B	Round Houses and Turntables:							
	Thomaston	$30,000						
	Other	2,383			32,383	31.90#		10,359
16-C	Stations and Grounds		688	2,419				688
	Stations and Grounds				3,602	45.09	(D-1)	1,624
16-D	Section Houses and other Road Bldgs				3,009	45.09		1,357
16-E	Coal Sheds and Trestles				5,269	31.86	(D-16)	1,678
16-F	Water Tanks and Pump Houses				6,038	31.86		1,924
16-G	Track Scales			2,350				
16-H	Fixtures				554	31.55*		175
			688	4,769	52,124			18,167

	Total Mich.	Pass.		Acct.	Mich.	Pass.
*16-A to 16-H	57,027	17,992		#72	14,310	408
	100%	31.55%	for assignment of 16-H	81	42,917	17,896
					57,227	18,304—31.99%

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

1914 D-4

Maint. of Equipment		Mich.	Pass.
Acct. No.	25	$ 95,640	$34,979
Acct. No.	31	35,083	35,083
Acct. No.	34	118,672	.....
Acct. No.	43	8,859	3,658
		$258,254—100%	$73,720—28.54%

1915 D-4

Maint. of Equipment		System	Mich.	Mich. Passenger
Acct. No.	308	$ 93,458	$ 79,744	$33,725
	314	146,912	125,816	.....
	317	50,303	41,350	41,350
	326	5,735	4,445	1,993
		$296,408	$251,355—84.8% of System	$77,068—30.60% of Mich.

1916 D-4

Maint. of Equipment		System	Mich	Mich. Passenger
Acct. No.	308	$102,989	$ 87,830	$31,160
	314	139,181	119,806	.....
	317	46,155	37,489	37,489
	326	6,599	5,526	2,253
		$294,924	$250,651—84.99% of System	$70,902—28.29% of Mich.

89.49% of System Accts. 301, 302, 334 assigned to Mich.
28.29% of Mich. Common Accts. 301, 302, 332, 334 assigned to Passenger.

1917 D-4

Maint. of Equipment		System	Mich.	Mich. Passenger
Acct. No.	308	$127,367	$108,260	$40,880
	314	160,384	136,214	.....
	317	50,613	41,854	41,854
	326	14,208	11,342	4,374
		$352,572	$297,670—84.43% of System	$87,108—29.26% of Mich.

COMPLAINANT'S EXHIBIT 210

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

1914 A/C 66-Indust. & Immigration Bureaus.

1914 D-5

Total Rev.—System	$3,313,552.—100%	I. & I. B. Exp.—Total	$11,056.
Frt. Rev.—System	2,091,597.—63.12%	I. & I. B. Exp.—Frt. 63.12	6,979.
Pass. Rev.—System	1,221,955.—36.88%	I. & I. B. Exp.—Pass. 36.88	4,077.
Total Frt. Rev.	$2,091,597.—100%	I. & I. B. Ex. Frt	$6,979.
Out of Mich. Frt. Rev.	273,536.—13.08%	I. & I. B. Ex. Frt. Out of Mich	913.
Mich. Frt. Rev.	1,818,061.—86.92%	I. & I. B. Ex. Frt. Mich	6,066.
Total Pass. Rev.	$1,221,955.—100%	I. & I. B. Ex. Pass.	$4,077.
Out of Mich. Pass. Rev.	167,941.—13.74%	I. & I. B. Ex. Pass. Out of Mich	560.
Mich. Pass. Rev	1,054,014.—86.26%	I. & I. B. Ex. Pass. Mich	3,517.

$6,066.+$3,517.=$9,583. Total Mich.

1915 D-5

Traffic A/C No. 366—Industrial & Immigration Bureaus.

	Per Cent	Indust. & Im. Bureau Exp.	
System Revenue	$2,778,099—100	$9,456	Total (System)
System Frt. Revenue	1,813,059— 65.26	6,171	Frt. (System)
System Pass. Revenue	965,040— 34.74	3,285	Pass. (System)
	Per Cent	Indust. & Im. Bureau Exp.	
System Frt. Revenue	$1,813,059—100	6,171	System Frt.
Mich. Frt. Revenue	1,603,110— 88.42	5,456	Mich. Frt.
Other States Frt. Revenue	209,949— 11.58	715	Other States Frt.
	Per Cent	Indust. & Im. Bureau Exp.	
System Pass. Revenue	$ 965,040—100	$3,285	System Pass.
Mich. Pass. Revenue	837,443— 86.78	2,851	Mich. Pass.
Other States Pass. Rev.	127,597— 13.22	434	Other States Pass.

Mich. Pass.	$2,851
Mich. Frt.	5,456
Total	$8,307

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

Traffic Acct. 366—Indust. and Im. Bureaus.

1916 D-5

	Per Cent	Indust. and Im. Bureau Expense	
System Rev.	$3,320,130—100	$8,464	System
System Frt. Rev.	2,316,448— 69.77	5,905	Frt.
System Pass. Rev.	1,003,682— 30.23	2,559	Pass.
	Per Cent	Indust. and Im. Bureau Expense	
System Frt. Rev.	$2,316,448—100	$5,095	System Frt.
Mich. Frt. Rev.	2,067,559— 89.26	5,271	Mich. Frt.
Other States Frt. Rev.	248,889— 10.74	634	Other States Frt.
	Per Cent	Indust. and Im. Bureau Expense	
System Pass. Rev.	$1,003,682—100	$2,559	System Pass.
Mich. Pass. Rev.	865,266— 86.20	2,206	Mich. Pass.
Other States Pass. Rev.	138,416— 13.80	353	Other States Pass.

Mich. Frt.	$5,271
Mich. Pass.	2,206
Mich. Total	$7,477

1917 D-5

Traffic Acct. 366—Indust. and Im. Bureaus.

System Revenue		Indust. and Im. Bureau Expense
Frt.	$2,741,033— 70.79%	$6,462
Pass.	1,131,358— 29.21%	2,666
Total	$3,872,391—100	$9,128
		Indust. and Im. Bureau Exp. Frt.
Frt. Rev. Mich.	$2,415,802— 88.13%	$5,695
Frt. Rev. Other	325,231— 11.87%	767
Frt. Rev. Total	$2,741,033—100%	$6,462
		Indust. and Im. Bureau Pass. Exp.
Pass. Rev. Mich.	$ 970,784— 85.81%	$2,288
Pass. Rev. Other	160,574— 14.19%	378
Pass. Rev. Total	$1,131,358—100%	$2,666

Mich. Frt.	$5,695
Mich. Pass.	2,288
Total Mich.	$7,983

COMPLAINANT'S EXHIBIT 210

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Michigan Revenue Train Miles and All Switching Miles D-6

	1914	1915	1916	1917
Mich. Rev. Frt. Train Miles	797,192	672,641	767,717	836,193
Mich. Frt. Train Loco. Switching Miles	126,878	96,820	120,775	145,490
♯Mich. Frt. Yard Loco. Switching Miles	290,497	237,728	312,326	343,885
Total Frt	1,194,567—59.28%	1,007,189—55.85%	1,200,818—60.23%	1,325,568—62.69%
Mich. Rev. Pass. Train Miles	{779,623	754,165	751,454	751,803
	{ 30,982	32,448	31,704	32,599
Mich. Pass. Train Loco. Swchg. Miles	2,248	2,220	2,202	2,214
Mich. Pass. Yard Loco. Swchg. Miles	7,765	7,288	7,304	2,190
Total Pass	820,618—40.72%	796,111—44.15%	792,664—39.76%	788,806—37.31%
Total	2,015,185—100%	1,803,300—100%	1,993,482—100%	2,114,374—100%

♯Includes switching in Soo Yard.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

1914 D-7

Transportation Exp.		Mich.		Passenger
Total		$1,089,026		$335,045
Less 61	$18,786		$5,200	
77	18,595		6,492	
78	14,341		1,980	
94	143		58	
97	10,652		3,252	
98	918		126	
104	714		123	
105	3,563	31,904	1,013	12,249
		$1,057,122—100%		$322,796—30.53%

1915 D-7

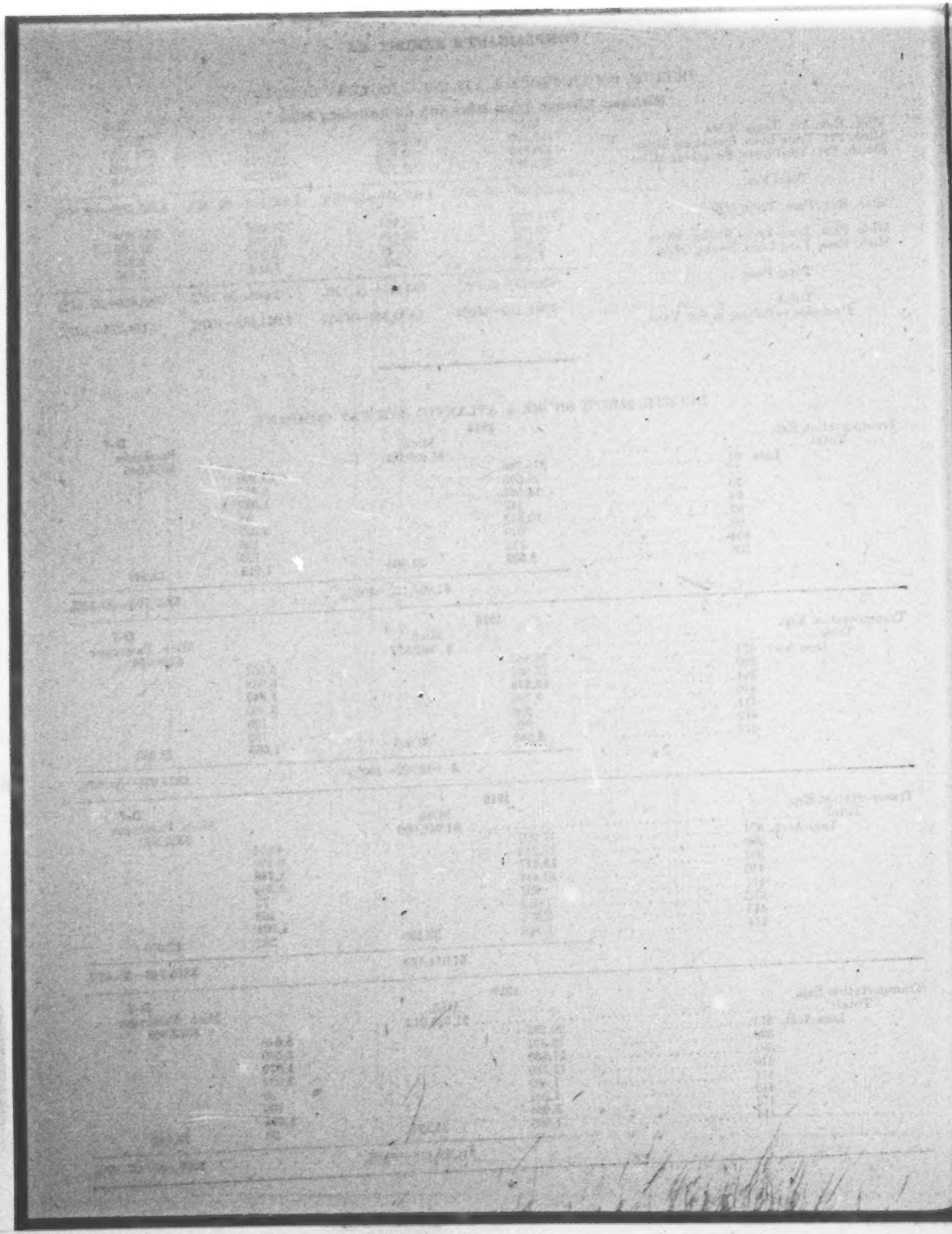
Transportation Exp.		Mich.		Mich. Passenger
Total		$ 962,877		$326,708
Less Acct. 371	18,483		5,501	
390	17,081		6,938	
391	13,579		1,849	
410	9,756		3,280	
411	958		129	
412	936		152	
413	3,550	30,085	1,068	13,083
		$ 932,792—100%		$313,625—33.62%

1916 D-7

Transportation Exp.		Mich.		Mich. Passenger
Total		$1,046,600		$322,822
Less Acct. 371	17,907		4,834	
390	17,212		6,199	
391	13,477		1,748	
410	10,444		3,385	
411	997		75	
412	1,083		103	
413	3,479		1,001	
414	1,443	32,130	232	12,079
		$1,014,470		$310,743—30.63%

1917 D-7

Transportation Exp.		Mich.		Mich. Passenger
Total		$1,325,012		$372,869
Less Acct. 371	20,253		5,640	
390	19,421		6,540	
391	17,280		1,830	
410	13,739		3,832	
411	1,509		20	
412	1,041		106	
413	3,884		1,094	
414	1,095	35,894	99	13,332
		$1,289,118—100%		$359,537—27.89%



COMPLAINANT'S EXHIBIT 210

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

1914 D-8

Acct. 61 System	$21,998	Car Acct's Office	$ 4,740			
		Balance	17,258			
	Assigned	System				Mich.
Car Acct's Office	15% Pass.	711	84.62%	Mich. (P. Car M.)		$ 686 Pass.
	85% Frt.	4,029	84.32%	Mich. (F. Car M.)		3,313 Frt.
		$4,740				$ 3,999

	System		
Balance Acct. 61	17,258—85.68%	Mich. Ohd. to all Transportation Accts. other than 61, 77, 78, 94, 97, 98, 104, 105	$14,787
		Total Mich.	$18,786
	Pass.		
	14,787—30.53%	Ohd. to all Transportation Accts. other than above	$ 4,514
		Car Acct's Office—Pass.	686
			$ 5,200

1915 D-8

Transportation Exp. Acct. 371					
Total Mich.	$18,483				
Less. Exp. of Car Acct's Office (Mich.)	3,778		Percent		Passenger
	$14,705		33.62	(D-7)	$4,944
		System			
Car Acct's Office	$4,425		Percent	Mich.	Passenger
Car Acct's Office Pass. 15%	664		83.92	557	557
Car Acct's Office Frt. 85%	3,761		85.64	3,221 Frt.	
				$3,778	$5,501

The 15% Pass. and 85% Frt. for division of Expenses of Car Accts. Office is arbitrary.
The 83.92% assigned to Mich. of the Pass. Expenses and the 85.64% of the Freight Expense is on the basis of Passenger and Freight Car Miles respectively.

1916 D-8

Transportation Exp. Acct. 371.				
Total Mich.	$17,907			
Less Expense of Car Acct's Office (Mich.)	3,872			Mich. Pass.
	$14,035—30.43%	(D-7)		$4,270
	System	Mich.		
Car Acct's Office	$4,521			
Car Acct's Office Pass. 15%	678	$ 564 Pass.		$ 564
Car Acct's Frt. 85%	3,843	3,308 Frt.		
		$3,872		$4,834

1917 D-8

Acct. 371 Superintendence—Transportation Exp.					
System.	$23,736		Michigan		Mich. Pass.
Less Car Acct's Office	4,885				
	$18,851—85.41%		16,100—27.89%	(D-7)	4,490
Car Acct's Office					
System.	$ 4,885	To Mich.			
Pass. 15%	733	84.19%	Pass. Car Miles	627	627
Frt. 85%	4,152	84.93%	Frt. Car Miles	3,526	
Total Mich.				$20,253 Mich. Pass	$5,117

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

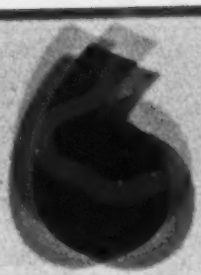
1914 D-9

Transportation Exp.		
Acct. 63 Station Employes	Total Mich.	Mich. Passenger
	$147,375—100%	39,060—26.50%

1915 D-9

Transportation Exp.		
Acct. No. 373 Station Employes	Total Mich.	Mich. Passenger
	$138,098—100%	$41,390—29.97%

5



COMPLAINANT'S EXHIBIT 210

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

1914 D-10

Acct. 72—Enginehouse Expenses, Yard.

Total Mich.	$14,310
Amt. arising from Soo Rd. House (Soo B. Sw. Acct)	1,488

		Pass.
$12,822—3.18%		$408

1915

Transportation Expenses Acct. 388—Enginehouse Expenses, Yard.

Total Mich.	$12,912
Amount of Soo Roundhouse	1,403

	Mich. Pass.
$11,509—3.38%	$389

1916 D-10

Acct. 388—Enginehouse Expenses—Yard.

Marq. Yard—Total	$7,497—Pass. 3.53%	$265
St. Ignace Yard—Total	1,630—Pass. 4.14%	67
		$332

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

1914 D-11

Transportation Exp.	Total Mich.	Mich. Passenger
Acct. 400 in 1916	$39,328—100%	$16,398—41.7%

There being no record of the number of engine housings in 1914, the 1916 ratio is used for dividing this Acct. in 1914.

1915 D-11

Transportation Exp.	Total Mich.	Mich. Passenger
Acct. 400 in 1916	$39,329—100%	$16,398—41.7%

There being no record of the number of engine housings in 1915, the 1916 ratio is used to divide this Acct. in 1915.

COMPLAINANT'S EXHIBIT 210

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

1914

D-13

Acct. 108—Operating Joint Tracks and Fac.—Cr.

	Total Mich. Common	Passenger
Water Supply (Tank Michigamme)	$ 202—34.29%	(1) $ 69
Station Sup. and Expenses	327—26.50%	(2) 87
Station Sewier—Chassell	120—40.72%	(3) 49
	$ 649	$305 Cr.

(1) Basis Acct. 83 Water for Yard Loco.
(2) Basis Acct. 66 Sta. Sup. and Exp.
(3) Basis Acct. 63 Sta. Emp. (Common).

1915

D-13

Transportation Exp. Acct. 413—Operating Joint Tracks and Fac.—Cr.

		Mich. Pass.
Water Tanks	$ 222—38.37%	(1) $ 85
Wells and Supplies—Various Stations	442—44.15%	(D-6) 195
		Cr. $280

(1) Basis Acct. 397 Water for Train Loco. Total Mich. $12,253—100% Mich. Pass. $4,702—38.37%

1916

D-13

Transportation Acct. 413—Operating Joint Tracks and Facil.—Cr.

		Mich. Pass.
Water Tanks	$ 183—34.44%	(1) $ 63
Various Stations	461—39.76%	(D-6) 183
	$ 644	$246

Water for Train Loco. Mich. $11,068—100% Mich. Pass. $4,122—34.44% (1)

1917

D-13

Transportation Acct. 413—Operating Joint Track and Fac.—Cr.

		Percent	Mich. Pass.
Water Supply	$ 249	32.56 (Below)	$ 81
Station Supplies, etc	535	37.31 (D-6)	200
	$ 784		$281

Water for Train Loco. Mich. $14,397—100% Mich. Pass. $4,688—32.56%

COMPLAINANT'S EXHIBIT 210

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

1914

	Michigan	D-14 Passenger
Maint. of Way and Structures	$ 661,709	$250,837
Maint. of Equipment	361,844	92,489
Traffic Expenses	88,067	46,215
Transportation Expenses	1,089,026	335,045
	$2,200,646—100%	$724,586—32.92%

1915

	Total Mich.	D-14 Mich. Pass.
Maint. of Way and Structures	$ 444,634	$185,022
Maint. of Equipment	361,588	100,646
Traffic Expenses	79,448	40,020
Transportation Expenses	962,877	326,708
Miscellaneous Operations	36,478	36,478
	$1,885,025—100%	$688,874—36.54%

1916

	Total Mich.	D-14 Mich. Pass.
Maint. of Way and Structures	$ 485,133	$175,638
Maint. of Equipment	365,255	94,185
Traffic Expenses	74,007	34,513
Transportation Expenses	1,046,600	322,822
Miscellaneous Operations	35,899	35,899
	$2,006,894—100%	$663,057—33.04%

1917

	System	Total Mich.	D-14 Mich. Pass.
Maint. of Way and Structures	$ 743,959	$ 595,391	$305,704
Maint. of Equipment	502,263	422,547	111,624
Traffic Expenses	87,145	72,230	32,076
Transportation Expenses	1,565,117	1,325,012	372,337
Miscellaneous Operations	50,588	41,319	41,319
	$2,949,072	$2,456,499—83.30% of System	$763,060—31.06% of Mich.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY CO.

Fuel Apportionment for use in Division of Maintenance of Fuel and Water Stations. D-16

	Acct. No.		Total Mich.	Pass. Pro.
1914	73	Yard	$ 22,745	$ 723
	82	Train	268,348	92,012
			$291,093	$ 92,735—31.86% of Mich.
1915	382	Yard	$ 21,417	$ 724
	394	Train	223,235	85,655
			$244,642	$ 86,379—35.31% of Mich.
1916	382	Yard	$ 28,288	$ 717
	394	Train	251,254	86,546
			$279,542	$ 87,263—31.22% of Mich.
1917	382	Yard	$ 40,214	$ 1,068
	394	Train	369,290	120,246
			$409,504	$121,314—29.62% of Mich.

COMPLAINANT'S EXHIBIT 210

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

1915 D-17

Maint of Way & Structures.
Acct. 235 Shops and Enginehouses:

	Mich.	Mich. Pass.	
Marquette Shops	$ 1,328	30.66% (D-4)	$ 407
Enginehouses	2,136	31.90% (‡)	683
			$1,090

‡Assigned on basis of Accts. 388 and 400.

	Mich.	Mich. Pass
Acct. 388—Eng. House Expense. Yard	$12,912	$ 389
Acct. 400—Eng. House Expense. Train	38,019	15,854
	$50,931	$16,243
	100%	31.9%

1916 D-17

Maint. of Way and Structures.
Acct. 235—Shops and Enginehouses.

Marquette Shops	$ 1,119 Pass. 28.29% (Basis Accts. 308, 314, 317, 326)—	$ 316
Eng. Houses	19,028 Pass. 30.52% (Basis Accts. 388, 400)—	5,807
		$6,123

	Mich.	Pass.
Acct. 388	$15,489	$ 332
Acct. 400	39,329	16,398
	$54,818	$16,730
	100%	30.52%

1917 D-17

Maint. of Way and Structures.
Acct. 235—Shops and Enginehouses.

Marquette Shops	$1,320	Mich. Pass.
St. Ignace Shops	10	$ 389
	$1,330—Pass. 29.26% (D-4)	1,581
Enginehouses	$5,591—Pass. 28.27%	$1,970

	Mich.	Pass.
Acct. 388	17,977	376
Acct. 400	48,306	18,364
	66,283	18,740
	100%	28.27%

COMPLAINANT'S EXHIBIT 210

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Acct. 275. Insurance. 1915 D-18

		Ratio	% Mich. Pass	
Insurance on Station and Road Bldgs., Freight	$ 283			
Insurance on Station and Road Bldgs., Pass.	127			$127
Insurance on Station and Road Bldgs., Common	473	M.T.M.	48.65	230
Insurance on Bridges and Trestles, Common	666	M.T.M.	48.65	324
Insurance on Round Houses and Enginehouses, Common	464	Acct. 388-400	31.90	148
Insurance on Shops, Common	340	Acct. 305-314 317-326	30.62	104
Insurance on Water Tanks and Pump Houses, Common	314	Acct. 382-394	35.31	111
Insurance on Coal Trestles, Common	198	Acct. 382-394	35.31	70
	$2,865			$1,114
Insurance on Ore Docks	1,134			
Insurance on Ridge St. House	30			
	$3,979			

Acct. 275. Maing. of Way and Struc. 1916 D-18

Schedule:	Insurance Frt.	Michigan Pass.	Common	Pass. Pro. of Common %	
1. Station and Road Bldgs	109.94	128.90	709.54	44.63 (D-1)	$317
2. Eng. and Round H	31.80		415.80	30.52 (Acct. 388-400)	127
5. Shops, etc., Marq			238.00	28.29 (D-4)	67
5. Shops, Other			23.71	28.29 (D-4)	7
6. Tanks and Pump Houses	7.20		332.40	31.22 (D-16)	104
7. Bridges and Ties	3.12		638.50	44.63 (D-1)	285
9. Coal Ties	3.12		252.10	31.22 (D-16)	78
Ore Docks	937.50				
	1.10				
$60.00 of the $128.90 Marq. Pass. Station	1,091.50	128.90	2,610.05		$985

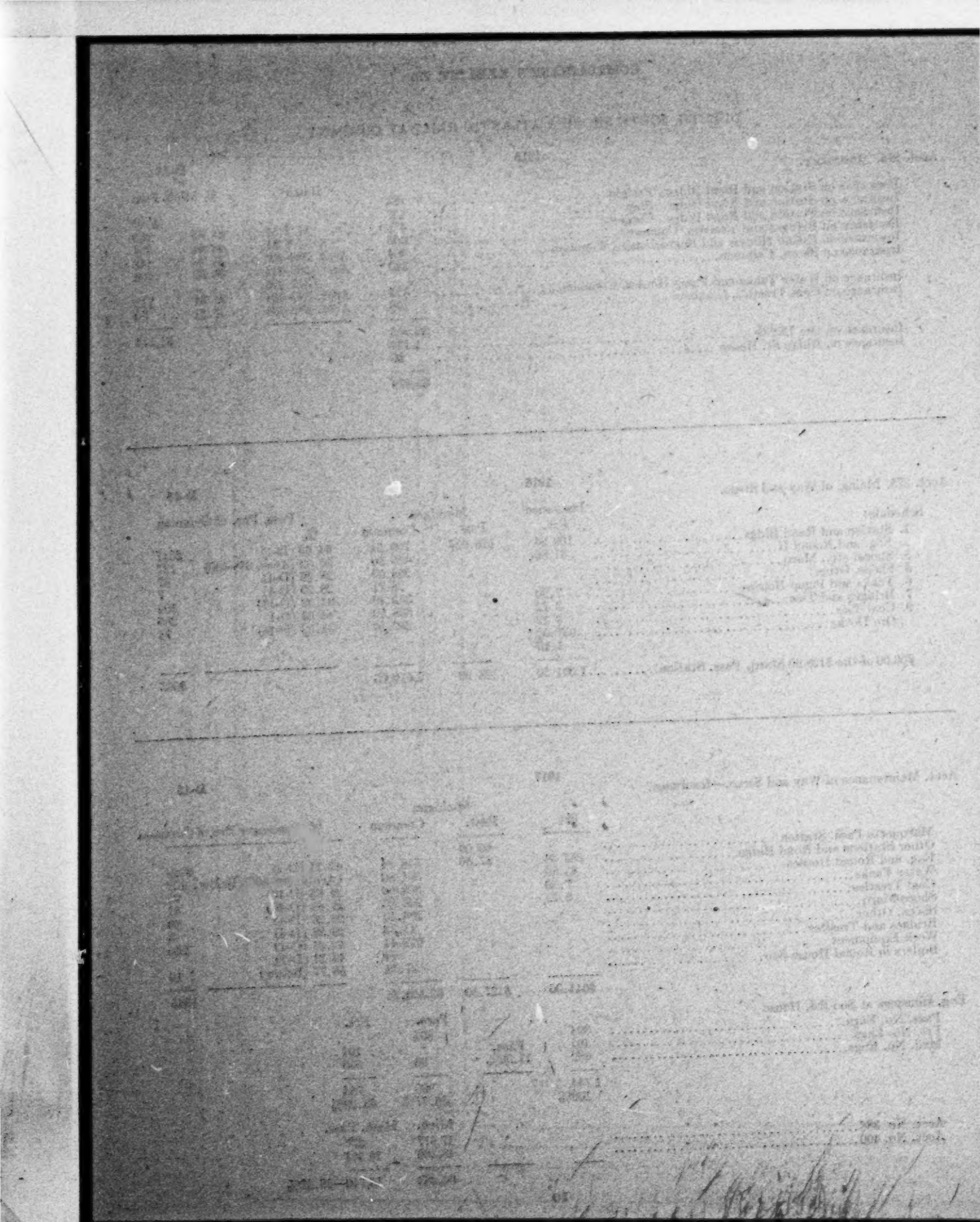
Acct. Maintenance of Way and Struc.—Insurance. 1917 D-18

	Frt.	Michigan Pass.	Common	% Passenger Pro of Common	
Marquette Pass. Station		60.00			
Other Stations and Road Bldgs	283.34	67.50	518.34	42.21 (D-1)	$219
Eng. and Round Houses	43.80		361.80	(Accts. 388-400) (Below)	102
Water Tanks	7.20		302.60	29.62 (D-16)	90
Coal Trestles	6.72		205.86	29.62 (D-16)	61
Shops-Marq			294.40	29.26 (D-4)	89
Shops, Other			11.32	29.26 (D-4)	3
Bridges and Trestles			628.44	42.21 (D-1)	265
Work Equipment			64	42.21 (D-1)	
Boilers in Round House Soo			27.34	56.77 (Below)	16
	$341.05	$127.50	$2,350.74		$845

Eng. Housings at Soo Rd. House

			Pass.	Frt.
Pass. No. Engs	894		894	
Frt. No. Engs	161	Pass.		161
Mxd. No. Engs	689	13.99%	96	593
	1,744		990	754
	100%		56.77%	43.23%

	Mich.	Mich. Pass.
Acct. No. 388	17,977	376
Acct. No. 400	48,306	18,364
	66.283	18,740—28.27%



COMPLAINANT'S EXHIBIT 210

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

1915

D-19

Acct. 333. Insurance—Maintenance of Equipment:	System	%	Mich.	%		Passenger
Marquette Shops	599.40	100	599	30.66	(D-4)	$184
Pass. Cars	182.08	82.83	153	100		153
Sleeping Cars	76.80	75.97	59	100		59
Dining Cars	70.40	84.46	60	100		60
Freight Cars	609.88	85.64	522			
Work Cars	53.04	77.26	41	48.65	(D-1)	20
Freight Locomotives	110.40	83.48	92			
Passenger Locomotives	72.00	82.75	60	100		59
Switch Locomotives	14.80	100	15	3.38	(D-15)	6
			$1,601			$541

1916

D-19

Acct. 333. Insurance—Maintenance of Equipment:	Mich. Frt.	Mich. Pass.	Mich. Common		Assignment of Common to Pass.
Sched.					
1—Miscl. Bldgs. other than Shops	.80		42.80		
4—Contents of Round Houses	4.80	.30	29.20		
5—Marq. Elec. Light Plant			24.00		
5—Marq. Paint Shop (Contents)		12.00			
5—Marq. Shops			479.20		
10—Pass. Cars		279.14			
Locomotives			206.25		
Frt. Cars	1,025.03				
Work Cars			43.20	(D-4)	
	1,030.63	291.44	824.65—28.29%		$233

1917

D-19

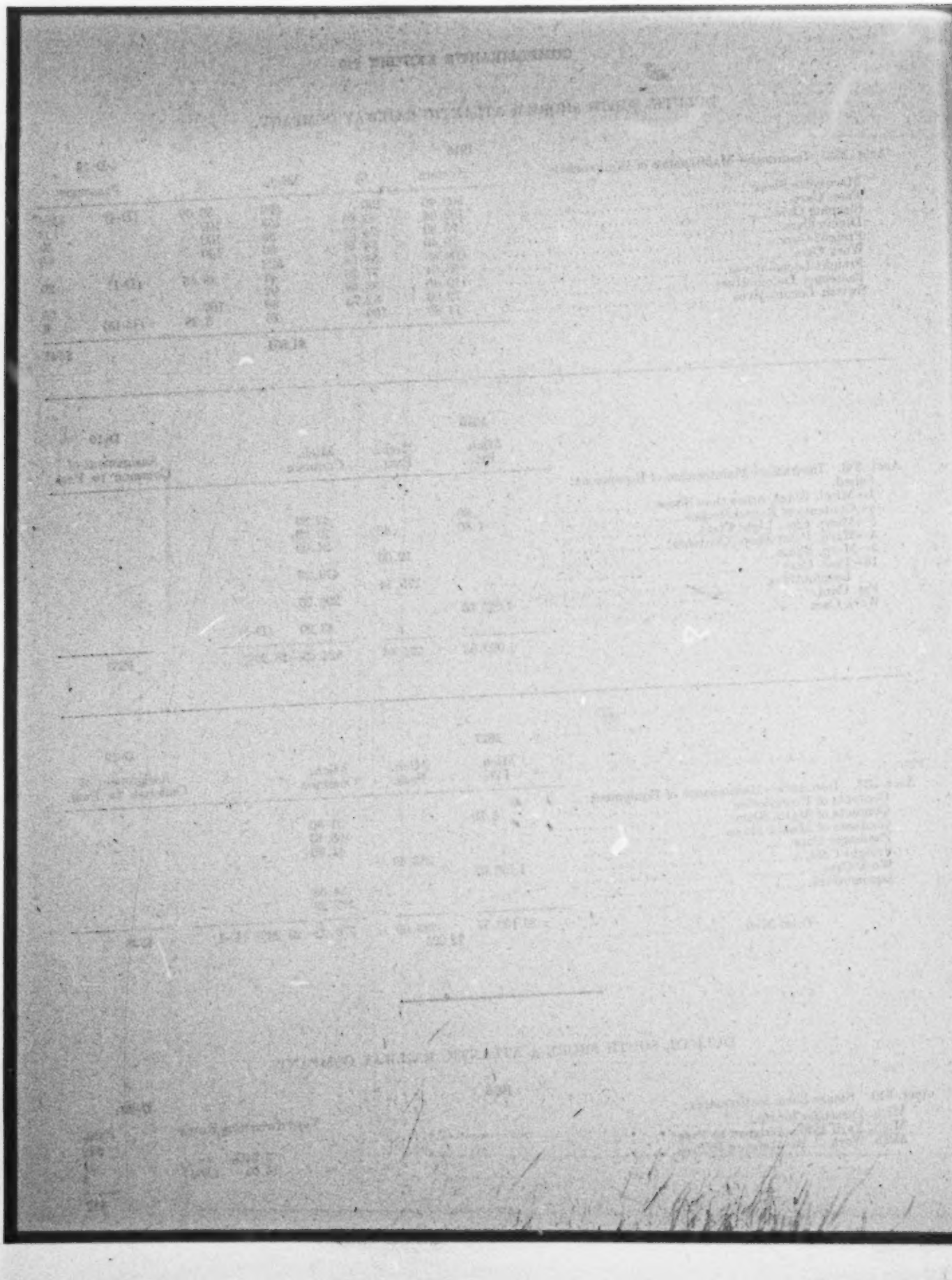
Acct. 333. Insurance—Maintenance of Equipment:	Mich. Frt.	Mich. Pass.	Mich. Common		Assignment of Common to Pass.
Contents of Roundhouse	4.50		31.80		
Contents of Marq. Shops			498.40		
Contents of Miscel. Shops			41.60		
Passenger Cars		283.69			
Freight Cars	1,156.07				
Work Cars			34.93		
Locomotives			172.29		
Total Mich.	$1,160.57	283.69	779.02—29.26%	(D-4)	$228
		$2,223			

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

1916

D-20

Acct. 310. Steam Loco. Retirements:	Yard Switching Rates		Pass.
Mich. Passenger located			$22
Mich. Yard $836—Assigned to Pass	2.54%		21
Mich. Work 9—Assigned to Pass	44.63	(D-1)	4
			$47



COMPLAINANT'S EXHIBIT 210

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Taxes Paid State of Michigan.

Date Paid	Amount	For Cal. Year	Application to Fiscal Years Fiscal, 1914	Fiscal, 1915	Fiscal, 1916	Fiscal, 1917
April, 1914	$215,585	1913	$107,792			
April, 1915	192,926	1914	96,463	$ 96,463		
April, 1916	214,358	1915		107,179	$107,179	
April, 1917	187,569	1916			93,784	$ 93,785
					Estimated,	93,785
			$204,255	$203,642	$200,963	$187,570

	Total	Passenger		Passenger Intrastate	Passenger Interstate
1914 Taxes—Mich	$204,255	31.03%	$63,380	64.69%	$41,001	$22,379
1915 Taxes—Mich	203,642	31.03%	63,190	70.29%	44,416	18,774
1916 Taxes—Mich	200,963	31.03%	62,359	70.81%	44,156	18,203
1917 Taxes—Mich	187,570	31.03%	58,203	70.67%	41,132	17,071

Basis for Division of Taxes between Pass. and Frt.:

Total Mich. Property—June 30, 1917		$18,070,158
Less Schedule 34 Ferries	$171,000	
36 Soo Depot	47,673	219,573
Total Mich. Pass. Property—June 30, 1917		$17,850,585—100%
Less Schedule 34 Ferries—Pass.		$ 5,569,514
36 Soo Depot	$31,173	31,173
		$ 5,538,341—31.03% Passenger.

Assignment to Intra. and Inter. on Passenger Miles of the respective years.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Internal Rev. Tax on D. S. S. & A. Ry. Sleeping Car and Observation Car Tickets Sold by D. S. S. & A. Ry.

Number of Passengers on which 1 Cent Tax was Computed.

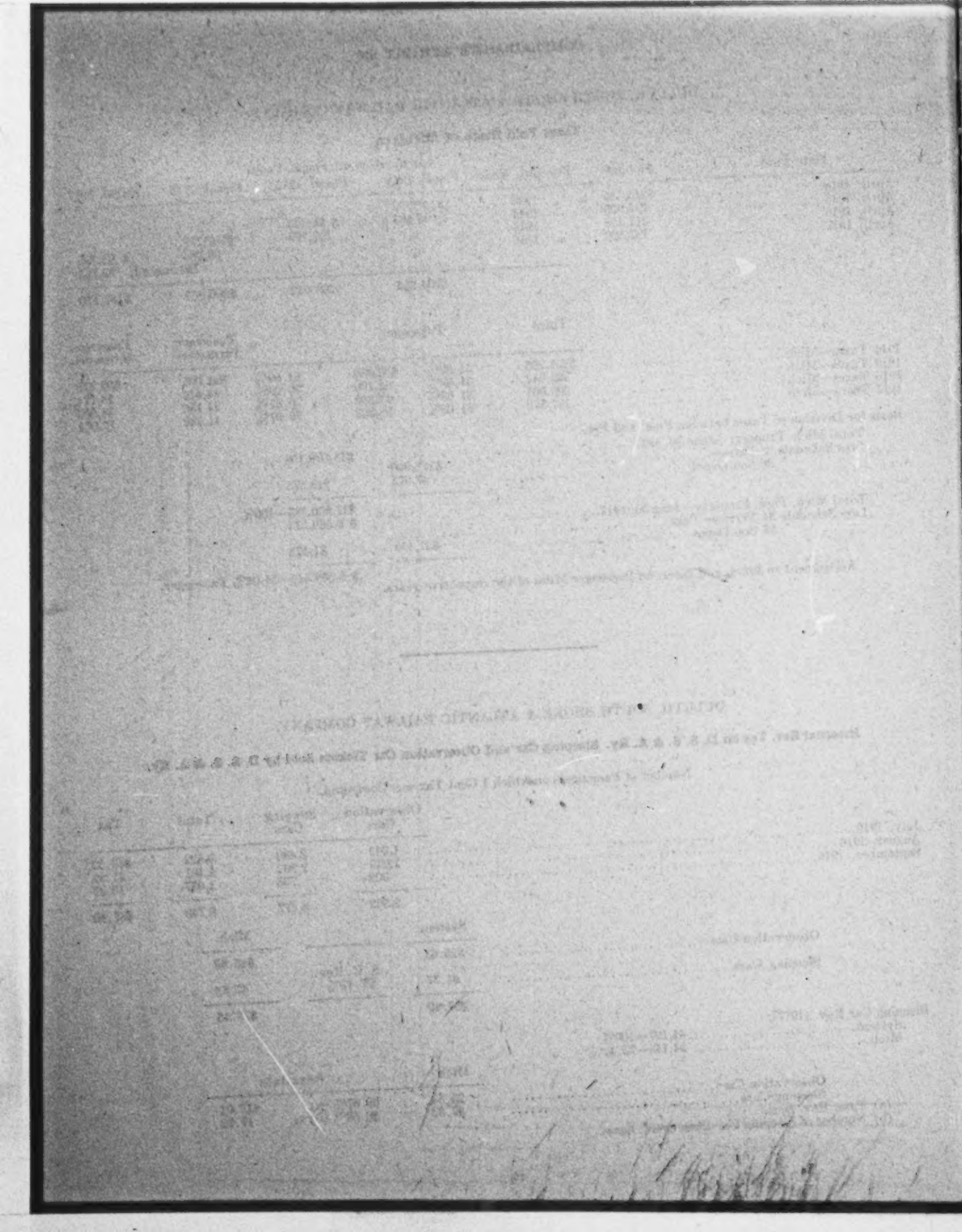
	Observation Cars	Sleeping Cars	Total	Tax
July, 1916	1,042	2,480	3,522	$35.22
August, 1916	1,219	2,962	4,181	41.81
September, 1916	302	735	1,037	10.37
	2,563	6,177	8,740	$87.40

	System		Mich.
Observation Cars	$25.63		$25.63
Sleeping Cars	61.77	S. C. Rev. 77.42%	47.82
	$87.40		$73.45

Sleeping Car Rev. (1917):
System..... 44,107—100%
Mich..... 34,148—77.42%

	Mich.		Intrastate
Observation Cars	25.63	69.87% (a)	$17.91
Sleeping Cars	47.82	36.63% (b)	17.52

(a) Pass. Rev. Basis.
(b) Number of Sleeping Car Passengers, basis.



COMPLAINANT'S EXHIBIT 210

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

Assignment of Mich. Pass. Operating Expenses to Intrastate and Interstate.

1914

	Mich. Pass. Expenses	%	Intrastate
Outside Agencies (Traffic Expenses)	$ 23,153	7.97	$ 1,845
Advertising (Traffic Expenses)	4,186	30.94	1,295
Station Employees	39,060	87.42	34,146
Station Sup. and Expenses	2,878	87.42	2,516
Expenses arising from operation of Soo Bdge	132	All Inter.	
Bal. of Operating Expenses	683,078	64.69	441,883
	$752,487		$481,685

1915

	Mich. Pass. Expenses	%	Intrastate
Outside Agencies (Traffic Expenses)	$ 17,830	$ 7.97	$ 1,421
Advertising (Traffic Expenses)	3,727	30.94	1,153
Station Employees	41,389	89.20	36,919
Station Sup. and Expenses	2,784	89.20	2,483
Expenses arising from operation of Soo Bdge	181		
Operating Sleeping Cars	10,943	25.34	2,773
Sleeping Car Repairs	3,900	25.34	988
Sleeping Car Depreciation	2,057	25.34	521
Bal. of Operating Expenses	634,440	70.29	445,948
	$717,251		$492,206

1916

	Mich. Pass. Expenses	%	Intrastate
Outside Agencies (Traffic Expenses)	$ 14,211	7.97	$ 1,133
Advertising (Traffic Expenses)	3,319	30.94	1,027
Station Employees	39,571	89.20	35,297
Station Supplies and Expenses	3,507	89.20	3,128
Expenses arising from operation of Soo Bdge	343		
Operating Sleeping Cars	10,566	25.34	2,677
Sleeping Car Repairs	3,853	25.34	976
Sleeping Car Depreciation	2,033	25.34	515
Bal. of Operating Expenses	615,542	70.81	435,865
	$692,945		$480,618

1917

	Mich. Pass. Expenses	%	Intrastate
Outside Agencies (Traffic Expenses)	$ 12,553	7.97	$ 1,000
Advertising (Traffic Expenses)	3,071	30.94	950
Station Employees	42,781		37,951
Station Supplies and Expenses	4,057		3,509
Expenses arising from operation of Soo Bridge	64		
Operating Sleeping Cars	11,016	33.28	3,666
Sleeping Car Repairs	3,877	33.28	1,290
Sleeping Car Depreciation	2,045	33.28	681
Bal. of Operating Expenses	711,257		502,645
	$790,721		$551,782

IN THE

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1918.

No. 760.

ALEX. J. GROESBECK, CASSIUS L. GLASGOW, CHARLES S. CUNNINGHAM, ADDISON A. KEISER, ET AL., DEFENDANTS AND APPELLANTS,

vs.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY, PLAINTIFF AND APPELLEE.

MOTION TO ADVANCE CASE.

To the Honorable the Chief Justice and Associate Justices of the Supreme Court of the United States:

Now comes the Duluth, South Shore & Atlantic Railway Company, a corporation of the States of Michigan and Wisconsin, and moves that the abovetentitled case be advanced upon the docket of this court.

Your petitioner respectfully represents that the following is a brief statement of the matter involved, to wit:

Your petitioner owns, and, until its property was taken over by the Director General of Railroads of the United States,

was operating a system of railroads between Duluth, in the State of Minnesota, and Sault Ste. Marie, in the State of Michigan, with branches thereof in the States of Michigan and Wisconsin, and was engaged in the business of transporting freight and passengers for hire in said States. Prior to 1911 it was authorized by the statutes of the State of Michigan to charge for the carriage of intrastate passengers in said State at a rate not to exceed three cents per passenger mile. In 1911 the legislature of said State enacted a law, the effect of which was to require your petitioner to put into effect on that portion of its railroad which runs in the State of Michigan rates of fare not to exceed two cents per passenger mile, under extreme penalties for failure to comply with said act. On July 26, 1911, your petitioner filed this suit in the District Court of the United States for the Eastern District of Michigan, to restrain the enforcement of said act. Said case was assigned by the District Judge for hearing before Herbert L. Baker, Esq., Special Master, who, after an exhaustive hearing, lasting five years, reported to the court that the rate of fare prescribed in the act complained of was insufficient to allow your petitioner to earn a fair return on the value of the property employed in its intrastate passenger business in Michigan, and that said act complained of was confiscatory and void as in violation of the Fourteenth Amendment to the Constitution of the United States. Said case later came on for hearing before the Honorable Clarence W. Sessions, District Judge, upon exceptions to the Master's Report and upon additional proofs taken in open court, resulting in a decree perpetually enjoining the defendants from attempting to enforce said act against your petitioner. From that decree the defendants have appealed to this court. At the time of filing of this suit a temporary restraining order was entered, restraining the defendants, who are the Attorney General and the Members of the Railroad Commission of the State of Michigan, from attempting to enforce said act

against your petitioner. Said restraining order was thereafter continued, upon your petitioner agreeing to issue to each intrastate passenger carried upon its line a coupon by which it agreed to repay to such passenger the difference between the fare paid by him and the rate of fare fixed in the act complained of, if and when, in such suit, said act should be declared constitutional, and upon your petitioner filing a bond in the sum of $200,000 to secure the prompt payment of such coupons. Later, after your petitioner had issued coupons to the amount of said sum of $200,000 and was unable to provide any further bond, your petitioner was required, by order of the court, to deposit in certain banks, as security for the payment of such coupons, all of its receipts from the carriage of intrastate passengers in Michigan in excess of said rate of two cents per passenger mile, and your petitioner, in compliance with said order of court, proceeded to issue such coupons and to make such deposits until the final decree of the court in this case.

Your petitioner further represents that its reasons for this application are that this case presents certain questions of great interest and importance at the present time, both to your petitioner and to the people of the State of Michigan, which demand speedy decision. Although on December 31, 1917, the President of the United States, under authority of the act of Congress entitled "An act making appropriations for the support of the army for the fiscal year ending June 30, 1917, and for other purposes (Acts of 64th Congress, chapter 418, U. S. Statutes at Large, vol. 39, part I, Public Laws, pages 619, 645)," took possession of and assumed control of your petitioner's entire railroad system, and on June 1, 1918, the Director General of Railroads of the United States filed new passenger tariffs, fixing the rate of fare to be paid by passengers on such railroad at the sum of three cents per passenger mile and since such date said railroad has ceased to issue coupons under such restraining order, said act of the Legislature of the State of Michigan prescrib-

ing the rate of two cents per mile is still in force and effect and has never been repealed. Under the terms of the statute by which the President took possession of such railroad system, he may return the same to the control of your petitioner at any time after the conclusion of a peace with Germany, which time is now very near, and when such railroad is returned to your petitioner, the State of Michigan will insist upon the enforcement of such statute and it it most important to your petitioner and to the people of said State to know, as soon as possible, whether such statute is valid and constitutional in so far as it effects your petitoner or not.

Your petitioner further represents that it has large debts and obligations for accounts payable, incurred prior to the taking over of its property by the Director General of Railroads of the United States and for equipment trust notes and other corporate obligations, which debts and obligations it is utterly unable to meet; that its railroad property has been taken from it by the President of the United States, under the authority of the act of Congress above referred to, and your petitioner is, therefore, unable, by further mortgaging its property, to obtain any money to pay its said accounts and obligations; and that the amount of money in the banks, deposited there under the orders of the court for the redemption of the coupons issued by your petitioner under said restraining order issued in this case, is $815,585.83, all of which funds will be immediately available to your petitioner if and when the decree in this cause shall be affirmed by this court, and which funds will enable your petitioner to save its credit and to take care of its outstanding obligations, if the same can be obtained without too great delay.

The questions presented in this case may be properly stated as follows:

1. What is the reasonable value of the property of your petitioner in the State of Michigan used by it in its intrastate passenger business?

2. What is the estimated probable return which would be

received by your petitioner from its intrastate passenger business in the State of Michigan under the rates of fare prescribed under the act complained of?

3. If the rates of fare fixed by the act complained of had been in force and effect during the years 1911, 1912, 1913, 1914, 1915, 1916, 1917, and 1918, what would have been the annual net return to your petitioner from its intrastate passenger business in Michigan?

4. Said questions above stated involve also the several questions as to the methods of valuation of property, the division of property used in common between the passenger and the freight services, and the division of the passenger property between intrastate and interstate. They involve also the division of revenues and expenses, so as to determine what portion of the revenues and expenses of your petitioner's entire system arose or are chargeable to its business in the State of Michigan, how these Michigan expenses should be divided between the passenger and the freight services, and how the passenger expenses in the State of Michigan should be divided between intrastate and interstate.

Both parties have filed with the clerk notice of the portions of the record which they deem should be printed, and it is expected that the portions of the record included in said notices will be printed without undue delay.

WILLIAM D. McHUGH,
JOHN E. TRACY,
Counsel for Petitioner.

SUBJECT INDEX.

PAGE

Statement of the Case..... 1
Designation of Errors relied on..... 11
Discussion of Errors Designated..... 15
Valuation of the Property..... 12

I.

The Court should have excluded the South Line and the expenses of its operation and maintenance, for the purposes of this case.....15-21

II.

The Western Division was improperly valued and plaintiff should have been required to segregate its revenues and expenses.....22-30

III.

The operations on the Mineral Range should be excluded 31-33

IV.

The Sleeper and Diner Businesses are not an integral part of the intrastate passenger and must be treated as outside operations.....34-45

V.

PAGE

The Trial Court erred in employing improper factors for the division of common property and common expenses 46-63

VI.

Plaintiff failed to overcome by proper proof the presumption of validity of the statute attacked..64-75

INDEX OF CASES CITED.

PAGE

Arkansas Railroad Rates, in re, 168 Fed. 720, 732... 26
Arkansas Rate Case, 187 Fed. 290..... 38
Covington & Lexington Turnpike Road Company vs. Sanford, 164 U. S. 578..... 20
Denver vs. Denver Union Water Co., 246 U. S. 178... 72
Louisville & Nashville R. R. Co. vs. Railroad Commission, 208 Fed. 35..... 39
Minnesota Rate Cases, 230 U. S. 352.....47, 66
Norfolk & Western Ry. Co. vs. Conley, 236 U. S. 605.. 36
Northern Pacific R. R. Co. vs. North Dakota, 236 U. S. 585..... 36
Reagan vs. Farmers Loan & Trust Co., 154 U. S. 412.. 29
Rowland vs. Boyle, 244 U. S. 106..... 50
San Diego Land & Town Co. vs. Jasper, 189 U. S. 439, 443 .....13, 18, 73

PAGE

San Diego Land Co. vs. National City, 174 U. S. 739, 758 ..... 33, 37, 66
Smyth vs. Ames, 169 U. S. 466, 541 ..... 19, 28
Southern Pacific R. R. Co. vs. Bartine, 170 Fed. 725.. 28
Stanislaus County vs. San Joaquin C. & I. Co., 192 U. S. 201 73
Western Passenger Fares Case, 37 I. C. C. Rep. 1.... 50
Wilcox vs. Consolidated Gas Co., 212 U. S. 19.... 70, 72
4 R. C. L., 632 71

UNITED STATES OF AMERICA

IN THE SUPREME COURT

ALEX. J. GROESBECK, et al,
Defendants and Appellants,
vs.
DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY,
Plaintiff and Appellee.

No. 759
October Term, 1918.

BRIEF FOR APPELLANTS

STATEMENT OF FACTS.

This suit was instituted by bill of complaint filed by the Duluth, South Shore & Atlantic Railway Company on the 28th day of July, 1911, for the purpose of enjoining the enforcement of the amended passenger fare law of the State of Michigan, as applied to plaintiff's railroad. The Attorney General of the State and the members of the Michigan Railroad Commission were made parties defendant to the action. These appellants are the successors in office of the original defendants. In addition to the State officials named three individuals were formally

joined as representatives of the traveling public. These individuals, however, took no part in the case at any stage of the proceeding and they have not joined in this appeal from the decree of the lower court.

The statute attacked in this case, the so-called two-cent fare law of the State, is found in section 9 of Act 198 of the Public Acts of the State of Michigan for the year 1873, as amended by Act 276 of the Public Acts of 1911 (section 8243 of the Compiled Laws of 1915) commonly referred to as the general railroad law of the State. In substance, this section of the statute, as amended, requires that all railroads of the State whose gross passenger earnings as reported to the State Railroad Commission exceeds the sum of $1,200 per mile should be permitted to charge a maximum rate of fare of two cents per mile for the transportation of any passenger and his ordinary baggage not exceeding 150 pounds in weight. The statute also contains the usual provision of one-half fare for children under twelve years of age.

Prior to the time that Act 276 of 1911 became operative, the plaintiff company was permitted by law to charge on the basis of three cents per mile. Immediately before the date that the amendment of 1911 went into effect, plaintiff filed its bill setting up that it was subject to the act because its gross passenger earnings exceeded the sum of $1,200 per mile of road, and alleging that if it were compelled to reduce its rates to the basis of two cents per mile for each passenger carried in intrastate traffic, it would thereby be deprived of the right to earn a reasonable return upon that portion of its property devoted to the intrastate passenger business, and that in consequence such property would be confiscated contrary to the provisions of the Fourteenth Amendment of the Federal Con-

stitution (Record Vol. 1, page 11). Averments were also included in the bill asserting that the plaintiff company was discriminated against, that its inter-state traffic was interfered with and other matters, but these questions were not regarded in the court below as material. At all stages of the proceeding, the question of confiscation has been considered to be the vital issue. The entire inquiry in the district court was directed to this point as is shown by the opinion of the trial court.

The plaintiff company in its bill of complaint sought a temporary restraining order, and also temporary and permanent injunctions, to prevent defendants from taking any action whatsoever to enforce the statute. Upon the filing of the bill, the restraining order asked for was issued by Judge Angell. The application for the temporary injunction was duly argued before three judges of the federal court, but before a decision was rendered a re-argument became necessary because of the retirement from the bench of one of these judges. For reasons that have no bearing on the determination of the issues here, such re-argument was never had. The temporary restraining order was, however, continued in effect by various court orders made from time to time, until the final decree of the district court, from which this appeal is prosecuted, was rendered. Because of the existence of this outstanding restraining order, the statute has never been put in actual operation on plaintiff's railroad, and plaintiff has never carried passengers in intrastate traffic in Michigan at two cents per mile. We have not in this case, therefore, the benefit of an actual test as to the effect of the operation of the rate fixed by the statute.

It should be mentioned in this connection that by order of the court the continuance of the restraining order re-

ferred to was conditioned on the issuance by plaintiff of so-called "rebate coupons" to each passenger buying a ticket or paying a cash fare for transportation in intrastate traffic. This coupon or certificate obligated the railroad company to repay to each such passenger the amount of the excess fare collected from him in the event that the validity of the statute is finally upheld by the court (Record Vol. 1, page 15). By subsequent orders of the court, all of which appear in the record, plaintiff was required to give a bond in the sum of $200,000 to insure the performance of its obligation. It finally appearing that the bond was not sufficient to cover the amount of the liability of the company in the event that a decree adverse to it should be rendered, it was required by the court that a redemption fund should be created for the protection of the holders of the rebate coupons or certificates, the excess fares collected being deposited in such fund. The decree of the trial court (Record, Vol. 1, page 92) required the plaintiff to continue issuing these coupons or excess fare receipts. We understand that this practice was continued by the plaintiff company up to the time that the rates of fare prescribed by the United States Railroad Administration went into effect.

The fund created to take care of the coupons has been kept intact for the purpose for which it was created pending the final outcome of the case. It is our understanding that the amount in such fund at the present time is materially in excess of $800,000, which, if the validity of the statute is upheld by this court, will be returned to the individuals from whom the excess fare has been collected on presentation of the receipts. Because of these outstanding obligations the question becomes material as to the validity of the two-cent law during each and every year

since Act 276 of 1911 became operative, in which its operation has been suspended by virtue of the restraining order. If the statute was valid as to any of such years, the holders of coupons issued during that year are entitled to the refund. It is necessary to determine, therefore, not only the effect of the prospective operation of the statute but also whether the same would have been confiscatory in each of the various fiscal years 1912 to 1917 inclusive.

On the filing of the answer to the bill, denying the main allegations thereof, a Master was appointed by the court, to whom was referred the taking of testimony and reporting on the issues in the case. At that time, the Minnesota rate case was pending before this court and it appears that there was some delay on the part of the Master and of counsel due to a mutual desire to await the decision to the end that certain disputed questions of practice and principles of law might be definitely settled. Extended proofs were finally presented by both sides covering the fiscal years ending June 30, 1912 and June 30, 1913. In its showing the railroad company assumed that if its intrastate passenger rate was reduced to a two cent basis, it would do no greater business than under the three cent rate. In other words, a flat loss was assumed (Record Vol. 1, page 343). On the closing of the testimony in March, 1915, the case was submitted to the Master, who presented his report to the court on the first day of February, 1917. This report appears as Volume III of the Record in this court. Exceptions to the Master's report were duly taken by both parties and the case was brought on in the District Court for the Eastern District of Michigan before Judge Sessions. It was the desire of the court that the proofs should be brought down to date, and accordingly the parties to the case undertook

the furnishing of additional testimony covering the operations of the plaintiff company from the 1st of July, 1913, to and including the 30th of June, 1917. This additional testimony was offered in open court, and the case was submitted on this testimony and on the previous testimony taken and recorded before the Master. For the reasons set forth in his opinion (Record Vol. I, pages 73, 89 inclusive), the District Judge held that the State statute was invalid as applied to plaintiff's railroad, and that its operation should be enjoined. From the decree rendered pursuant to this opinion (Record Vol. 1, pages 90, 92) the defendant officials of the State have prosecuted this appeal.

The system of the Duluth, South Shore & Atlantic Railway Company extends across the Upper Peninsula of Michigan from east to west, and also crosses the northern part of Wisconsin to Duluth, Minnesota. It connects with the Canadian Pacific, which company controls plaintiff's system through stock ownership, at the latter city as well as at the city of Sault Ste. Marie, Michigan. Exhibit A-1, which is a railroad map of the State of Michigan and which has been returned to this court with the other Exhibits in the case, shows the precise location of that part of plaintiff's system lying within this State. The total mileage, as stated in the bill of complaint (Record Vol. I, page 2), is approximately 584 miles of main line and branches, of which 475 miles of track is situated in Michigan. Practically all of the remaining mileage is in the state of Wisconsin where, as appears by the allegations of the bill of complaint, plaintiff charges two cents per mile for intrastate passenger traffic (Record Vol. 1, page 6).

In addition to the Michigan mileage of main track and branches, there is an extensive mileage of spurs and sidetracks, most of which are used exclusively in the freight business. The aggregate mileage of all track within the State is classified as follows:

Miles of main line used in common service	408.25
Miles of main line used in exclusive freight service	12.07
Miles of spurs and sidings used in passenger service	2.10
Miles of branches, spurs and sidings used in exclusive freight service	158.34
Miles of branches, spurs and sidings used in common service	40.80

(Record Vol. V page 524.)

It will be noted that there is a very high proportion of track mileage devoted exclusively to the freight traffic, a situation undoubtedly due to the peculiar nature of the business of the plaintiff company, especially its ore business. We shall refer to this fact later, particularly in connection with the discussion of the question as to the division of property and expenses.

Plaintiff's system as a whole comprises three distinct divisions: the so-called Eastern Division, serving the eastern part of the Upper Peninsula of Michigan and extending between St. Ignace, Sault Ste. Marie and Marquette; the Houghton Division, comprising that part of the system extending from Marquette west to Nestoria, thence to Houghton, or, as it is commonly referred to in Michigan, "the copper country"; the Western Division, embracing all of that part of the system west of Nestoria, Michigan, to Duluth, Minnesota, including the Wisconsin

mileage and having a total of 101 miles of main line track within the State of Michigan. The first two divisions serve in the main intrastate traffic insofar as passenger business is concerned; the third or Western Division is primarily an interstate proposition, connecting the Duluth, South Shore & Atlantic with the Canadian Pacific at Duluth.

In this connection we wish to call the attention of the court to the allegation in the bill of complaint (Record Vol. 1 page 2) that the principal business of the system of the plaintiff company is interstate commerce either wholly upon its own line or in conjunction with other carriers. The matter of the construction and operation of this Western Division is of vital importance in this case and we shall insist that it always has been, and now is, an interstate project, and that for the purpose of determining whether the intrastate passenger fare law is constitutional, as applied to plaintiff's system, the earnings and expenses of this division should be segregated from the earnings and expenses of the other divisions. It is our claim that the intrastate business cannot justly be burdened with a loss arising from an added part of the system designed and operated for interstate traffic.

It will be noted from the railroad map above referred to (Exhibit A-1) that the plaintiff company has two lines of track from the city of Marquette west to Ishpeming and Negaunee. The so-called south line was built in the years 1883 and 1884 for the purpose of competing with the road then operated by plaintiff's predecessor, principally in the transportation of ore. The reports to the State Railroad Commission, which have been returned with the other original exhibits, indicate the nature of the business. In 1885 the Marquette, Houghton and Ontonagon (plaintiff's

predecessor) purchased the south line (Record Vol. II page 1072) for the purpose of avoiding a ruinous competition. Both lines have since been continuously maintained and operated. It is not claimed, however, that the acquisition of the south line in its first instance nor its continued maintenance and operation was necessary in order to take care of the passenger traffic, nor for that matter, any traffic. It is obvious that we have here presented a factor that is not usually involved in a passenger rate case.

The railroad map also discloses that plaintiff company is compelled to compete in its ore business with the Lake Superior and Ishpeming. In the testimony of the witness Payne (Record Vol. II pages 1101, 1102) is set forth the reasons that led to the construction of this road. It appears that the predecessor of the plaintiff company charged a rate for the transportation of ore that the owners of the mines regarded as excessive. Refusal to reduce the rate was the real cause for the building of a competitor that has taken from the plaintiff company a large volume of business that it otherwise would have enjoyed. The inference is irresistible that because of bad judgment in a matter of business policy, the traffic of plaintiff here has been prejudiced.

The plaintiff company has been engaged for a number of years past in the operation of the track of the Mineral Range Railroad Company extending from Houghton to Calumet, Michigan. During the years 1914 to 1917 at least, the Mineral Range Company received the fares; and the South Shore received a certain amount of rental from other companies, namely, the Chicago and Northwestern and the Chicago, Milwaukee and St. Paul. The amount of such rental that can properly be apportioned to the account of the Mineral Range on a mileage basis is compara-

tively small, however, amounting in the year 1917 to $1,694.14 (Record Vol. V page 710). It appears from the testimony of plaintiff's General Manager, Mr. W. W. Walker, that the construction of an interurban line a number of years ago "forced the Mineral Range to take off its passenger trains." (Record Vol. II page 1159.) Subsequently the Duluth, South Shore & Atlantic undertook the operation. No mention of this op tion is found in the bill of complaint; but the railroad company insisted on its right to include the operation of this road as a part of its operations and added the expenses accordingly. It has been the contention of the appellants throughout, and it is now their contention, that the Mineral Range has been operated at a loss, that such operation was undertaken to take care of interstate traffic, and that under no view of the case can it properly be included.

To the decree of the trial court, the defendants duly prepared and filed their assignments of error (Record Vol. I pages 99 to 103). Subsequently a statement made by counsel for the purpose of limiting the record on appeal was filed on behalf of defendants (Record Vol. I pages 125, 128), which to some extent modifies the questions set forth in the assignment of errors. We wish to discuss herein only the points raised that seem to us to be of controlling importance, necessarily passing by many interesting questions presented by the Record, some of which were earnestly contested before the Master in the court below, but the determination of which cannot be reasonably claimed to be vital to the determination of the case as presented to this court on the record.

We shall insist herein that the decree of the trial court was erroneous and that it should be reversed for the following reasons:

(1) Because the so-called South Line was included in plaintiff's property for the purposes of this case, was valued on the cost of reproduction less depreciation theory and no deduction was made by plaintiff or by the court on account of the cost of operating and maintaining the same;

(2) Because the Western Division was permitted by the court to be valued on the same theory and no separation of the revenues and expenses of such Division was required on the part of the railroad company;

(3) Because the expenses of the operations on the Mineral Range Railroad were included with the result that the revenues received by the Railroad Company from the operation of its own property (the threatened confiscation of which is the issue here involved) were diminished by the losses so incurred;

(4) Because the District Court treated and considered the sleeper and diner businesses as an integral part of the passenger traffic and refused to consider them as auxiliary or outside operations and to assign to the same their proper proportion of the property and particularly their proper proportion of the expenses;

(5) Because the District Court employed for the purposes of this case improper methods and factors for the division of common property and common expenses between freight and passenger traffic;

(6) Because the Court determined that the evidence produced by the plaintiff was sufficient to overcome the presumption of validity and to establish confiscation, and assumed that under the operation of the statute assailed, the plantiff company would suffer the loss of revenue because of the reduction in rate, based on the business done

under the higher rate, and without any allowance whatever for a probable increase in business following a reduction.

We wish to take up the consideration of these propositions in the order above stated. It will be noted that the first three are of similar character and perhaps they might logically be discussed together. However, for the sake of clarity we believe that it is preferable to treat them separately in order that no possible confusion may arise with reference to the facts involved.

Before taking up these points in detail, however, we wish to refer briefly to the matter of valuation. The District Court indicated in his opinion (Record Vol. 1, page 83) that an accurate fixing of the value of plaintiff's property devoted to the intrastate passenger business was not necessary because of the conclusion reached by him on the other issues in the case. He, therefore, did not indicate in figures any specific finding as to valuation. It is apparent, however, that if certain of the other material propositions had been differently decided by the court, the finding of an approximately accurate value would have been required. The figures arrived at by the Master are of little value for the reason that they represent, not value, but the cost of reproducing, less depreciation. It is obvious from reading the Master's report that he disregarded the fact that in any event the reproduction method may properly be used only as a means to an end, the end being, of course, the ascertaining of fair present value. The Master, however, regarded it as the end itself.

In the statement made by counsel for defendants for the purpose limiting the record on appeal (Record Vol. I,

page 125) it was indicated that defendants would question, in certain particulars, the valuation arrived at by the Master. We believe that the record fully sustains our contentions with reference to all of the matters specifically referred to in said statement. The testimony as to the valuation of the various properties of the plaintiff is very full and detailed. Large numbers of witnesses were examined and it is not denied that each witness gave his best judgment for the guidance of the Master and of the court. Judgments of men naturally differ on any such question. The witnesses for the State were at least as competent to judge of values as were the witnesses for the railroad company. The fixing of a value greater than was warranted by the testimony of these witnesses certainly raises a doubt as to the correctness of the conclusion.

Without discussing the matter at any length, we desire to call the attention of the court, with reference to the question of value, to the affidavit made by the President of the Road before the State Tax Commission, which appears on pages 1066, 1068, of the Record (Vol. II). It was there declared that the sum of $9,600,000 was a fair valuation in 1912. As shown by the Record (page 1066) like affidavits were presented in the other years under investigation. Notwithstanding these sworn statements, however, plaintiff contended in this case, and doubtless will contend in this court, for a much greater valuation. It seems to us that the value thus declared by the Railroad Company to be a proper one for the purposes of taxation may well be taken into account. In the case of

San Diego Land and Town Co. vs. Jasper, 189 U. S. 439, 443,

it was said by Justice Holmes, speaking for this Court:

> "The valuation of property for the purposes of taxation may not be technical evidence in a court of law, yet it may be considered in coming to a decision whether the action of the supervisors was unfair, especially, if, as was testified, it was sworn to by the officers of the company."

In the case at bar, as in the water case, we have a sworn valuation, which should not have been disregarded by the Master, and which must be considered in fixing the value of this property.

In the absence of a definite finding by the trial court as to the value of the property used in the intrastate passenger business, we do not think it is necessary or expedient to take up in detail the specific property, the value of which is in dispute. To do so would necessarily involve an extended discussion and would consist largely of reference to the testimony in the record. This testimony speaks for itself. In the main it is clear-cut and specific. Furthermore, we believe that the determination of the questions above enumerated will be decisive of the case. If appellant's position with respect to any of the material propositions raised is correct, the conclusion must necessarily follow that the decision of the trial court was erroneous and that it should be reversed. We wish it to be understood, however, that there is no recession from the position taken by the defendants in the court below with respect to the conclusions as to value that were reached by the Master.

We now proceed to the consideration of the specific grounds of error enumerated above.

I.

For the purposes of this case the South Line should have been excluded in determining the value of plaintiff's property on the cost of reproduction less depreciation theory; and the expenses of maintaining and operating the same should likewise have been excluded from the total expense of maintenance and operation.

The plaintiff railroad company, in the proceeding before the Master, and before the Court, relied on the cost of reproduction new less depreciation theory for the valuation of its property. In doing this it proceeded on the assumption that if the road did not exist, it would be rebuilt exactly as it is, a wholly erroneous assumption insofar as the present case is concerned. In his opinion (Record Vol. 1 page 82), the trial court said:

> "It may well be doubted that if the plaintiff's railroad were now being constructed new two lines would be built paralleling each other from Marquette to Ishpeming."

There can be no question but that this conclusion was fully justified. Notwithstanding the fact, however, plaintiff based its case on the assumed right to include the

south line, and the attendant expenses of maintenance and operation, such line being valued in exactly the same manner as was the balance of the system.

It has been suggested that the consideration of the south line has a twofold aspect. On the one hand it touches the value of the property, but insofar as the determination of this case is concerned, it is of more vital importance because of the bearing on expenses.

If we are correct in our contention that the trial court should have required the plaintiff company to segregate the expense of maintenance and operation of this line, as well as to separate the property itself, it is apparent that the proofs introduced by plaintiff, and on which the decree appealed from was based, were improper and were lacking in requisite certainty. There is no exact proof as to the value of this line, the only fact introduced in evidence being that the Marquette, Houghton and Ontonagon (plaintiff's predecessor) paid for the line in 1884 a sum slightly in excess of $2,000,000. (Record Vol. II page 1072). The annual expense of upkeep including the wages of section men and other employes, the cost of ties and rail renewals, the maintenance of fences, the general care of the right of way and the track structure is wholly a matter of conjecture. That such annual expense during each of the years under consideration by the Court was material cannot be doubted. Had such expense been excluded from the aggregate expense of the system, plaintiff's showing, even on the theories and factors employed by it, would have failed to establish a prima facie case of confiscation.

As stated above, the south line was acquired by the predecessor of the plaintiff company for the purpose of

getting rid of injurious competition in the ore traffic. Quite possibly this was an expedient acquisition from a business standpoint. However, the traveling public of the State of Michigan cannot be required to underwrite an investment of this kind, nor may a State law be nullified because a railroad company for purely business reasons that have no connection whatever with the service to the public, or to the public welfare, finds it necessary to take over a competitor and to acquire the property used thereby.

It was not claimed in the Court below, and we do not understand that it will be claimed here, that two separate and distinct lines of railroad between Marquette and Ishpeming are, or at any time have been, necessary for the carrying on of plaintiff's business. It is true that a great deal of heavy ore traffic goes over the south line but insofar as the passenger business is concerned, there is absolutely no excuse for its existence, and a single road can easily handle the freight business, especially in view of the competition of the Lake Superior & Ishpeming. In any event, the expenses that are incurred by plaintiff in connection with the maintenance and operation of this line are not proper expenses to be considered in a case of this nature where the primary matter of concern is the passenger traffic within a single state.

It is a matter of fair inference that were it not for the ore business, the south line would have been abandoned long ago. No shadow of excuse would have existed for its continuance. Indeed, it is undoubtedly true that it never would have been built had it not been for the ore traffic. If it is now to be kept as a part of plaintiff's system, then the property it represents and the expense

of its upkeep must be charged to the traffic in which it is used and for which it was designed. We insist that the District Court erred in permitting the plaintiff to include this property and to include also its annual cost of upkeep and operation for the purpose of endeavoring to establish the insufficiency of a proposed intrastate passenger rate.

In a case involving alleged confiscation it is only the property devoted to the public service involved, and reasonably required for that service that may be taken into account. If a railroad company, or other public utility, is burdened with property that is not thus required in order that the public may be served, it cannot be permitted to charge rates that will support such added property. This Court has repeatedly declared that the rate to be charged by a common carrier must be fair not only to the carrier but to the public as well. It needs no argument to demonstrate that allowing a railroad company to charge a rate for transportation of passengers that will permit it to support property that is not necessary for the passenger business and which would never have been acquired therefor, is unjust to the travelling public. The principle declared by this court in *San Diego Land and Town Company vs. Jasper*, supra, seems to us to be controlling here. There the utility, the water plant, was constructed to take care of a much larger acreage than was really served. This Court declined to hold the rates fixed confiscatory even though a fair return upon the value of the entire plant was not received. It was declared that if necessary to avoid holding that the Fourteenth Amendment had been violated, the Court "should assume that only a proportionate part of the system was actually used and useful

within the meaning of the statute." This language suggests the exact situation in the case at bar. A part of the property only is reasonably required to be used for the plaintiff's business. The south line, we submit, cannot be regarded as a proper part of plaintiff's system for the purpose of the attack on the passenger fare law. The same principle was recognized in

Smyth v. Ames, 169 U. S. 466, where it was said:

> "It cannot, therefore, be admitted that a railroad corporation maintaining a highway under the authority of the State may fix its rates with a view solely to its own interests and ignore the rights of the public. But the rights of the public would be ignored if rates for the transportation of persons or property on a railroad are exacted without reference to the fair value of the property used for the public or the fair value of the services rendered but in order, simply, that the corporation may meet operating expenses, pay the interest on its obligations and declare a dividend to stockholders. If a railroad corporation has bonded its property for an amount that exceeds its fair value, or if its capitalization is largely fictitious, it may not impose upon the public the burden of such increased rates as may be required for the purpose of realizing profits upon such excessive valuation or fictitious capitalization; and the apparent value of the property and franchises used by the corporation, as represented by its stock, bonds and obligations, is not alone to be considered when determining the rates that may be reasonably charged. * * * The basis

of all calculation as to the reasonableness of rates to be charged by a corporation maintaining a highway under legislative sanction must be the fair value of the property used by it for the convenience of the public. And in order to ascertain that value, the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stock, the present as compared with the original cost of construction, the probable earning capacity of the property under particular rates prescribed by state, and the sum required to meet operating expenses, are all matters for consideration, and are to be given such weight as may be just and right in each case. We do not say that there may not be other matters to be regarded in estimating the value of the property. What the company is entitled to ask is a fair return upon the value of that which it employs for the public convenience. On the other hand, what the public is entitled to demand is that no more be exacted from it for the use of a public highway than the services rendered by it are reasonably worth."

In the previous case of

Covington & Lexington Turnpike Road Co. vs. Sanford, 164 U. S. 578, the principle was laid down that:

"The utmost that any corporation operating a public highway can rightfully demand at the hands of the legislature, when exerting its general powers, is that it receive what under all the circumstances is such compensation for the use of its property as will be just both to it and to the public."

We repeat that the plaintiff company may not insist on the right to collect such passenger fares in its intrastate traffic as will be sufficient to support property not intended or in any way required for that traffic. Such rates fall within the inhibition of the principles declared in the foregoing cases. If a carrier cannot by increasing its bonded indebtedness or its capitalization assert the right to charge rates accordingly, then by the same process of reasoning it may not take such action by voluntarily acquiring property that is not reasonably useful. The authorities hereinafter cited in connection with the discussion of the Western division are also in point upon the principle of law here involved. We ask, therefore, that those cases may be considered in connection with the foregoing, and as further illustrating the position that the courts have taken.

II.

The intrastate passenger traffic should not be charged in this case with the losses occurring on the Western Division, nor should such division be valued on the cost of reproduction less depreciation theory. Plaintiff should have been required to segregate revenues and expenses on said division.

There are two matters of fact in connection with the western division that have a pertinent bearing: First, the division was constructed solely to take care of interstate business and particularly to connect plaintiff's system with the Canadian Pacific system at Duluth; Second, because of such purpose the road was located without reference to intrastate traffic, either present or prospective.

The testimony introduced before the Master and before the court conclusively shows that this division is handling interstate traffic in the main. Reference to the map (Exhibit A-1) cannot fail to give the impression even to the casual observer that it was built for such traffic. The local business is light due to the fact that the communities actually served are sparsely settled. All of the witnesses who were examined on this point agreed that the

traffic on the western division was lighter than on any other part of plaintiff's system, and that the interstate traffic greatly predominated. Plaintiff's witness Maney testified (Record Vol. I page 486) before the Master as follows:

> "West of Nestoria on main line of the western division our interstate business is the greatest. The intrastate business on that division is quite light due to lack of population—the local business is very light. I cannot give the relations between the inter and intra state business there. The inter business is much greater in my opinion."

To the same effect is the testimony of Thompson (Record Vol. II page 860):

> "I think that the principal element of the addition to cost of carriage of interstate passengers and intrastate passengers, both relatively to the passenger mileage, is to be found in the conditions on the western division of the road where the interstate business is much greater than the intrastate business and where the total of the passenger business is light and the expenses correspondingly large."

Other witnesses testified to the same effect; and it is also shown that the road in the first instance was of lighter construction than the balance of the system. (Record Vol. II page 598.) Prof. Adams of the University of Michigan (Record Vol. II pages 1134 and 1135) testified from an historical standpoint as to the reasons for the original construction of the line running west from Nestoria. From an examination of over four hundred

contemporary references Prof. Adams drew the conclusion that:

> "The line west of Nestoria as shown by the citation which I have before me was built for the purpose of connecting up a through system. It was not built for the local traffic. It was built to make a link between the eastern portion and certain railroads centering or terminating in Duluth or Minneapolis, and my interpretation of these readings is that it would not have been built had it not been for the desire to make a through east and west system."

It is also in evidence that the physical features of the country through which the western division extends made the original construction difficult (Record Vol. II page 939). A comparison of the intrastate and interstate passenger miles from Nestoria west to the State line is also significant. The figures for the years 1916 and 1917 are as follows:

Year	Interstate	Intrastate
1916	5,090,983	1,072,032
1917	4,154,501	1,324,074

The line from Nestoria west to the Michigan-Wisconsin boundary passes through country very similar to the country crossed by plaintiff's line in Wisconsin. Construction and operating problems are practically the same. It is a fair assumption that the cost of operation of the western division in Michigan bears approximately the same relation to revenue as such cost on the Wisconsin section bears to the revenue received there. According to the accountant for the plaintiff (Mr. Delf) the operating ratios for that part of plaintiff's system outside of Michigan were as follows: 1914, 96.78; 1915, 111.4; 1916, 89.87;

1917, 97.84. The corresponding ratios covering plaintiff's operations in Michigan for the same years as given by the same accountant were: 1914, 77.87; 1915, 76.39; 1916, 67.89; 1917, 71.54. If it be true, and there can be no question but that it is true, that the operations on the western division are practically the same as plaintiff's operations on that part of its system outside of the state, then it conclusively follows from the figures above given that if plaintiff is losing money in Michigan, the loss is caused by the light traffic and difficulties of operation over the one hundred and one miles of road from Nestoria to the state line.

The court below in his opinion expressed a doubt as to whether "the western division would be placed in its exact present location" if plaintiff's system were to be reproduced. We assume that reference was intended here to the fact that a number of towns in Michigan that might have been reached and served by this division were passed by thus emphasizing the fact that the builders of the road were absolutely disregarding the intrastate traffic. The testimony of the witness Payne, a civil engineer, who had formerly been in the employ of the plaintiff company as well as in the employ of certain of its predecessors, is highly instructive. He said: (Record Vol. II page 1102)

> "The plaintiff's road runs west through the Montreal Valley from three to five miles north of the Gogebic Iron Range and north of the towns of Bessemer, Ironwood, Hurley and a few other small locations. Further west Ashland lies about 11.5 miles away. If I were constructing a new line through that country, I should locate for the local business, of the Gogebic Iron Range, meaning particularly the freight business. The passenger busi-

ness would cut some figure also. There would be considerably more local traffic along a line so located in Michigan than along the line as now located."

The principle has been repeatedly laid down by this court and by inferior courts, that a railroad or a division of a railroad that is constructed primarily for a certain traffic must look to that traffic for its support. Stated specifically, and with particular reference to the facts in this case, a division that is built for interstate traffic cannot be permitted to burden the intra traffic for the purpose of showing that a legislative rate applicable to the entire system within the state is confiscatory as to such system. In the

Arkansas Rate Case, 168 Fed. 720, 732,

it was said:

"Another matter which is entitled to consideration is the fact which has been brought out at this hearing, that the St. Louis Iron Mountain & Southern Railway Company and the Chicago, Rock Island & Pacific Railway Company have, within the last few years, and since the establishment of the commission rates, constructed extensive branch lines through new and unsettled sections of the state; and these lines were constructed at great expense, owing to the fact that the greater part of these branches runs through swampy country, some of it subject to overflows, which necessitated high embankments; that these roads were built principally to serve as feeders for the main line, and at the same time enable these roads to obtain shorter lines for that part of its interstate traffic which merely passed through the state. These are

matters which must be taken into consideration in determining what would be proper net earnings on the investments. It would hardly be proper for the courts to say that such roads are entitled to as great a compensation on their investments from intrastate business as the ordinary road built for the accommodation of the intrastate as well as the interstate business. As is well known, some of the Pacific roads traverse the desert for hundreds of miles through a strip of territory where there is practically no intrastate business, either freight or passenger. Would it be proper, in such cases, to hold that the road should have the right to charge for its intrastate traffic in that section tariff rates high enough to enable it to earn a certain, fixed percentage on its investment? Would not, in such a case, the rates have to be so high as to be confiscatory of the property of the residents of that state? Must the public guarantee the railroads a certain income on their investment, regardless of the condition of the country traversed, or whether bad judgment was exercised in the selection of the route? We do not think so. New lines or branches to increase the business of the main line, or the exercise of bad judgment in the building of a railroad, are matters to be considered in determining what rates would be fair and just to the corporation as well as the public. That the railroads are entitled to reasonable profits on their investments, and the public to reasonable rates, or, to express it differently, that the rights of the public and railroad companies are reciprocal, is the correct rule of law."

Likewise, in

Southern Pacific vs. Bartine, 170 Fed. 725,

it was stated that:

> "It does not necessarily follow that a schedule of maximum rates fixed by law is confiscatory because it fails to yield a reasonable return on the investment, above taxes, operating expense, and interest on the indebtedness. The rates must be reasonable to the company, but they must, in any event, be reasonable to the public. If a railroad is built into a new, sparsely settled territory with a view of serving a large future population and developing business, the constitution does not require the few people and the small business of the present time to pay rates which will yield an income equal to the full return to be gathered when the country is populated and business developed to the full capacity of the road. *Beale & Wyman R. R. Rate Reg.,* p. 343, 344, 462; *Capital City Gaslight Co. vs. Des Moines* (C. C.) 72 Fed. 829, 844; *Boise City I. & L. Co. vs. Clark,* 131 Fed. 415, 65 C. C. A. 399; *Water Dist. vs. Water Co.,* 99 Me. 371, 376, 69 Atl. 537."

These cases both follow the principle declared by this Court in

Smyth vs. Ames, 169 U. S. 466, 541,

where it was said:

> "Nor can the carrier justify unreasonably high rates on domestic business upon the ground that it will be able only in that way to meet losses on its interstate business. So far as rates of transportation are concerned, domestic business should not be made to bear the losses on interstate business,

nor the latter the losses on domestic business. It is only rates for the transportation of persons and property between points within the state that the state can prescribe; and when it undertakes to prescribe rates not to be exceeded by the carrier, it must do so with reference exclusively to what is just and reasonable, as between the carrier and the public, in respect of domestic business. The argument that a railroad line is an entirety; that its income goes into, and its expenses are provided for out of, a common fund; and that its capitalization is on its entire line, within and without the state can have no application where the state is without authority over rates on the entire line, and can only deal with local rates and make such regulations as are necessary to give just compensation on local business.

In the earlier case of

Reagan vs. Farmers Loan & Trust Co., 154 U. S. 412,

Justice Brewer, speaking for this court, had said in the concluding part of the opinion:

"It is unnecessary to decide, and we do not wish it to be understood as laying down as an absolute rule, that in every case a failure to produce some profit to those who have invested their money in the building of a road is conclusive that the tariff is unjust and unreasonable. And yet justice demands that everyone should receive some compensation for the use of his money, or property, if it be possible without prejudice to the rights of others. There may be circumstances that would justify such a tariff; there may have been extravagance and needless expenditure of money; there

may be waste in the management of the road; enormous salaries; unjust discrimination as between individual shippers, resulting in general loss. The construction may have been at a time when material and labor were at the highest price, so that the actual cost far exceeds the present value. The road may have been unwisely built, in localities where there is not sufficient business to sustain a road. Doubtless, too, there are many other matters, affecting the rights of the community in which the road is built, as well as the rights of those who have built the road."

We respectfully submit that under the doctrine of these cases that it was improper to value the western division on the cost of reproduction theory, and it was error on the part of the district court to refuse to require that the plaintiff should segregate its revenues and expenses on that division. We repeat that on this record, if there has been any failure on the part of the plaintiff to realize a sufficient return on that portion of its property devoted to the intrastate passenger business, such failure has been brought about by the loss occurring on this part of its system. It is most unfair, however, to charge the intrastate traffic with such loss for the purpose of nullifying the state law. It must have been foreseen by the plaintiff in the construction of the line west that intrastate conditions would not justify it, and that it must depend for its success on interstate traffic. If it was desired to have a through system (Record Vol. II, page 1135) then reliance must be placed on through traffic. Certainly residents of this state traveling on the western division, or on the Houghton division of plaintiff's system, ought not to be penalized because the system had been extended to include an interstate line.

III.

The expenses of the operation of the Mineral Range should have been excluded.

Previous to the 1st of October, 1912, the plaintiff company operated its trains over the line of the Mineral Range from Houghton to Calumet on the basis of a rental of 40 cents per train mile, plaintiff receiving the revenues. On or about the date mentioned, the contract was changed and from that time during the years under investigation the fares received were paid to the Mineral Range but plaintiff continued to operate the trains. (Record Vol. II, page 607.) The result has been a loss to the plaintiff company in each year, approximating annually $20,000. In 1917, when such loss was the greatest, a deficit of nearly $22,000 was suffered.

We have hereinbefore called attention to the fact that the bill of complaint made no reference to the Mineral Range Railroad. Bearing in mind that this is a case wherein the primary question is whether the property of the plaintiff company would have been confiscated as a result of the operation of the statute. It seems to us that there is no escape from the conclusion that the op-

eration of another independent railroad should have been excluded. It was plaintiff's property that was claimed in the bill to be threatened. It was plaintiff's road that was to be so injuriously affected that a reasonable return on that portion of the property devoted to the intrastate passenger business could not be earned under the reduced rate. Notwithstanding this fact, however, plaintiff insisted on bringing in the Mineral Range operation and was permitted so to do by the Master and by the court. In the case of a legislative proceeding by a commission, or other body authorized to fix rates, this might have been allowable; but in a judical inquiry to determine the constitutionality of a State law, it has no place. If the Mineral Range were a part of plaintiff's system, then, of course, the revenues received from the transportation of passengers over it would accrue to the plaintiff company, thus increasing its total receipts from its passenger business.

The Vice-President and General Manager of the plaintiff company testified (Record Vol. II page 1159), that the Mineral Range had been forced to discontinue its passenger trains because of the building of an interurban line from Houghton to Calumet which took care of the local traffic. He also said that:

> "A large proportion of the passengers Calumet to Houghton are through to other parts of the system; the local people use the traction line."

Thus it seems that plaintiff took over the Mineral Range in order to provide for interstate traffic, primarily the traffic to Chicago. It is clear that the local business, that is, the intrastate business did not justify such action. However, the making of this contract under

which the Mineral Range has been operated was purely a voluntary proposition and under no aspect of the case can it be made a burden on the intrastate traffic, in a case of this character. In

San Diego Land Company vs. National City, 174 U. S. 739, 758, a question arose indentical in principle with the proposition under consideration here. The nature of said question and the conclusion of this court with reference to it are indicated in the following quotation from the opinion:

> "One of the points in dispute involves the question whether the losses to the appellant arising from the distribution of water to consumers *outside of the city* are to be considered in fixing the rates for consumers within the city. In our judgment the Circuit Court properly held that the defendant city was not required to adjust rates for water furnished to it and to its inhabitants so as to compensate the plaintiff for any such losses. This is so clear that we deem it unnecessary to do more than to state the conclusion reached by us on this point."

The other cases cited in the preceding subdivision of this brief are also in point here. The general principle is that a common carrier may not nullify a State rate law by burdening itself with unnecessary property or voluntary losses. Having voluntarily assumed the operation of the Mineral Range, we submit that it must look to that operation for its return. It is an independent operation that must stand on its own basis.

IV.

The sleeper and diner businesses should have been segregated from the passenger business and each should have been assigned its proper proportion of the property and expenses as an auxiliary or outside operation.

The statutory provisions of the state with reference to the operation of sleepers and diners are found in Act 38 of the Public Acts of 1875 (8348-8349 Compiled Laws of 1915). Said act is short, and for the convenience of the court we insert it here:

> "An Act relative to the use of sleeping, parlor and chair cars upon the railroads of this state.
>
> Section 1. It shall be lawful for any railroad company operating any railroad within this state to construct or use for the transportation of passengers, sleeping cars, parlor cars, or chair cars, for the use of such passengers as may desire to use the same, and such company may make such reasonable rules and regulations concerning the use of these as such company may think proper, and may charge a reasonable compensation for such use in addition to the regular passenger fares allowed by law.

Sec. 2. Nothing herein contained shall release any such railroad company from its obligations to furnish first-class passenger cars for the use of the public for the regular passenger fares now fixed by law."

It will be noted that this statute does not require any railroad company to operate a sleeper or diner. It is wholly permissive in its terms, and the second section shows clearly the legislative intention that the furnishing of such facilities should be regarded as a service separate and apart from the regular passenger service. The requirement that sufficient first-class passenger coaches should be furnished for the use of the public at the prescribed passenger rates can be taken in no other way. Therefore, in electing to add sleepers and diners to its trains, thus taking advantage of the terms extended by the statute, plaintiff did a purely voluntary thing.

It is our contention that an added business of this nature must stand upon its own basis. It must be charged with its proper proportion of the property, and (which is of even greater importance) it must bear its proper proportion of the expense. Obviously, if such is not the case, then the regular passenger traffic must be burdened with expense arising from an outside operation that does not prove to be remunerative. In other words, the passenger who rides in the day coach must pay a part of the cost of the extra comfort and facilities furnished to the passenger who rides in the sleeper and parlor car and eats his meals in the diner.

For the reasons set forth in his opinion (Record pages 79, 81), the District Court declined to treat the sleeper and diner businesses as outside operations, declaring insubstance that they must be regarded as an integral

part of the passenger business. In this we insist that the court was in error. A state law prescribing ordinary passenger rates cannot be set aside because of a loss arising out of a purely voluntary business that the carrier has added. That there is a loss in this case from both sleepers and diners cannot be doubted. Plaintiff's accountant, Mr. Delf, admitted (Record Vol. I page 352) that there was a loss in the dining car service for each of the years 1910, 1911 and 1912. It is not denied that a similar condition existed in other years. Exhibits of Mr. Hillman and of Mr. Parker (Volumes IV and V of the Record) clearly establish this fact as to each year under investigation and that burden may not be permitted to fall on the traffic to which the statute assailed has sole reference. The principle laid down by this court in the case of

> *Northern Pacific vs. North Dakota*, 236 U. S. 585, and *Norfolk & Western Ry. Co. vs. Conley*, 236 U. S. 605,

seems to us to be conclusive. In the former case it was said:

> "We entertain no doubt that, in determining the cost of the transportation of a particular commodity, all the outlays which pertain to it must be considered. We find no basis for distinguishing in this respect between the so-called 'out-of-pocket costs,' or 'actual' expenses, and other outlays which are none the less actually made because they are applicable to all traffic, instead of being exclusively incurred in the traffic in question. Illustrations are found in outlays for maintenance of way and structures, general expenses and taxes. It is not a sufficient reason for excluding such, or other, ex-

penses to say that they would still have been incurred had the particular commodity not been transported. That commodity has been transported; the common carrier is under a duty to carry, and the expenses of its business at a particular time are attributable to what it does carry. The state cannot estimate the cost of carrying coal by throwing the expense incident to the maintenance of the roadbed, and the general expenses, upon the carriage of wheat; or the cost of carrying wheat by throwing the burden of the upkeep of the property upon coal and other commodities. This, of course, does not mean that all commodities are to be treated as carried at the same rate of expense. The outlays that exclusively pertain to a given class of traffic must be assigned to that class, and the other expenses must be fairly apportioned. It may be difficult to make such an apportionment, but when conclusions are based on cost, the entire cost must be taken into account."

In the West Virginia case, supra, this court referred to the fact that the items of mail, express, excess baggage, etc., were included in the passenger business and that the state had presented no calculations as to "the net return upon these items separately considered." Read in conjunction with what was said by the court in the North Dakota case, we understand this to mean that such showing should have been made for the purpose of establishing definitely the net return on the intrastate passenger business.

We wish to call attention also in this connection to the case of *San Diego Land Co. vs. National City*, 174 U. S. 739, 758, referred to in the preceding subdivision of this

brief. It was there held that a city in prescribing rates to be charged by a public utility for water furnished within the corporate limits was not required to take into account the operations of the utility outside of the city. By the same process of reasoning, the legislature of the State of Michigan in prescribing a rate for the transportation of intrastate passengers is not bound to consider outside operations or to make provision for the losses that may result therefrom.

The language used by Judge Trieber in his opinion in the

Arkansas Rate Case, 187 Fed. 290,

is particularly in point here. There, as here, facilities were furnished at a loss to the carrier. We quote from the opinion:

> "While there can be no doubt that the company has a right, insofar as it alone is concerned, to give away any of its property, in a controversy of this nature, involving the claim that the revenues derived from its business in the state, under the tariffs fixed by the state, is so small as to make them confiscatory, it cannot be permitted to do so, and should be charged with the reasonable value of its property, which, by its permission, is used by others, not for the benefit of the railroad, but for their individual profit. If by charging the value of these privileges, or any other matters which the law permits the carrier to charge for, the earnings on the rates fixed by the state are shown to be compensatory, it has no right to complain, and insist upon higher rates to enable it to act generously toward favorites. Generosity cannot be practiced at the cost of others. No evidence has been offered

by the company to explain why these valuable privileges are given away. No consideration of any kind is shown to have passed to the company therefor. The evidence shows that the expense of repairs and preserving the premises in proper condition is also borne by the railroad company. The finding must therefore be that this generosity ought not to be charged to the people of the state, but the loss must be borne by the railway company. Neither the statutes nor orders of the commission require it to give this or any of its other property away. It had a right, and it was its duty, so far as its claim in this cause is affected thereby, to charge and collect the fair value thereof. *Knoxville vs. Water Co.*, 218 U. S. 1, 12, 29 Sup. Ct. 148, 53 L. Ed. 371."

To the same effect was the opinion of Judge Shelby in the case of

Louisville and Nashville R. R. vs. Railroad Commission, 208 Fed. 35,

where it was said:

"It might be true that the plaintiff would fail to secure an adequate return on all of its property devoted to the public intrastate service, and yet the failure might not be due to the passenger rate. If the return were insufficient on the whole property, the passenger rate would not be made invalid unless it materially contributed to cause the insufficiency. It follows that to attack the order successfully, the insufficiency of the return must be shown, and also that the order as to passenger rates is at fault in causing the insufficiency."

The situation suggested by Judge Shelby's language is exactly that which obtains in the case at bar. If there would have been a loss on plaintiff's intrastate business, or rather a failure to earn a reasonable and fair return on the property devoted to that business, during the years under consideration if the two cent rate had been in effect, the burden rests on the plaintiff of establishing that such rate would have been responsible for the condition. But such showing necessarily involves, under the doctrine of the foregoing cases, the setting aside of the outside operations and of the property and expenses pertaining thereto. If this had been done by the district court in his computations (Record Vol. I, pages 86-88) an entirely different return on the intrastate passenger business standing alone would have been shown.

We wish to challenge the attention of the court at this point to the results obtained by setting out the expenses properly chargeable against the outside operations, that is, the sleepers, diners, mail and express. In preparing this tabulation the amounts used by the trial court as representing the Michigan passenger property and income are employed. No property is, however, assigned to the outside operations except the actual cars employed therein and a proportion of working capital and of stores and supplies. Assignments have been made to interstate and intrastate in the same manner as by the court. Bold-faced type has been used to represent deficits. For the purposes of comparison, we have assumed the correctness of the method used by the court for the division of the common property and of the common expense between the freight and passenger services.

	Total Michigan Passenger	Mineral Range	D.S.S.& A. Passenger	Mail & Express	Sleepers	Diners	Passengers and Baggage Total	Intra.	Inter.
1912									
Value of Passenger Property	$2,569,461	.....	$2,569,461	$27,725	$56,646	$67,122	$2,417,968	$1,538,553	$879,415
Net Income under Two-cent Rate	131,893	.....	131,893	39,792	55,016	29,805	176,722	127,293	49,429
Rate of return	5.14		5.14				7.31	8.27	5.62
1913									
Value of Passenger Property	$2,523,159	.....	$2,523,159	$27,725	$56,653	$67,116	$2,371,665	$1,555,338	$816,327
Net Income under Two-cent Rate	105,108	.....	105,108	34,036	57,734	56,454	185,260	130,591	54,669
Rate of Return	4.17		4.17				7.81	8.40	6.70
1914									
Value of Passenger Property	$2,788,674	.....	$2,788,674	$28,432	$56,653	$67,011	$2,636,668	$1,705,660	$931,008
Net Income under Two-cent rate	128,435	17,807	146,242	20,358	84,761	59,816	270,461	181,661	88,820
Rate of Return	4.57		5.24				10.26	10.65	9.54
1915									
Value of Passenger Property	$3,006,345	.....	$3,006,345	$29,799	$56,558	$67,011	$2,852,977	$2,005,358	$847,619
Net Income under Two-cent Rate	23,769	19,097	42,866	23,975	67,732	53,021	139,644	101,780	37,864
Rate of Return	0.79		1.42				4.90	5.07	4.47
1916									
Value of Passenger Property	$2,727,368	.....	$2,727,368	$29,484	$56,915	$67,427	$2,573,542	$1,822,325	$751,217
Net Income under Two-cent Rate	76,437	18,832	95,269	34,378	56,236	47,363	164,490	118,220	46,270
Rate of Return	2.80		3.49				6.39	6.49	6.16
1917									
Value of Passenger Property	$2,589,175	.....	$2,589,175	$30,429	$57,596	$68,250	$2,432,900	$1,719,330	$713,570
Net Income under Two-cent Rate	66,513	21,899	88,412	13,288	71,734	54,545	236,551	156,068	80,483
Rate of Return	2.57		3.41				9.73	9.08	11.28

In the court below in their computations both sides excluded the mail and express and the court did likewise in his tabulation (except as to the year 1917 to which the court refers in his opinion). We think that this was correct, and that for the same reasons that led to such exclusion by the plaintiff the sleeper and diner businesses should likewise have been excluded. In no other way can the true effect of the operation of the state law be determined.

It is shown by the record (Vol. II, page 1147) that the sleepers and diners operated by the plaintiff were so operated primarily for the interstate passenger traffic. This was particularly the case with reference to the heavy Pullman cars of the Northwestern and of the St. Paul carried over the line of the plaintiff from the junction points on those roads to Houghton and thence over the line of the Mineral Range to Calumet. Upon this particular operation we direct the court's attention to the testimony of plaintiff's general manager, Mr. Walker (Record Vol. II, pages 1158, 1159). It is shown also that the percentage of the interstate passengers using these facilities is much higher than is the corresponding percentage of intrastate passengers. For the year 1917 48.44% of the interstate passenger miles were made in sleepers, while the corresponding percentage on the intrastate side is only 8.81% (Record Vol. II, page 1071). These figures in themselves indicate that the loss occurring in these outside operations should be charged mainly against the interstate passenger traffic. However, the trial court refused to make any modification whatever in this respect (Record Vol. I, pages 80, 81). If it is consistent to divide passenger expense between interstate and intrastate on the basis of the passenger miles in each traffic (as both sides did on the trial and as the court has

done in his computations), then we submit that the expense of the sleepers, parlor cars, and dining cars should be apportioned in the same manner, namely, on the basis of the interstate and intrastate passenger miles traveled in such cars. The results obtained by applying such method of division are shown in defendant's exhibits Nos. 337 and 338.

It was also urged by defendants in the court below, as an alternative proposition that if the outside operations are not to be charged with their full proportion of the property and expenses that they should at least bear all of the additional expense incurred by them over and above the so-called "constant costs," that is, the cost that would be incurred by the regular passenger traffic if these operations were eliminated. This matter was gone into at some length by defendant's accountants, Mr. Parker and Mr. Hillman, and we call attention to their exhibits indicating the results. (Record Vol. II, page 1155). For the convenience of the court, we insert the following computation, which is merely a modification of the preceding computation obtained by charging to the regular passenger business the so-called constant costs, thus leaving the sleeper and diner business to stand merely the additional expense that they have caused:

	Total Michigan Passenger	Mineral Range	D.S.S.& A. Passenger	Mail & Express	Sleepers	Diners	Passengers and Baggage Total	Intra.	Inter.
1912									
Value of Passenger Property	$2,569,461	.....	$2,569,461	$27,725	$56,646	$67,122	$2,417,968	$1,538,553	$879,415
Net Income under Two-cent rate	131,893	.....	131,893	19,423	95,182	43,160	250,512	174,437	76,375
Rate of Return	5.14		5.14				10.37	11.34	8.69
1913									
Value of Passenger Property	$2,523,159	.....	$2,523,159	$27,725	$56,653	$67,116	$2,371,665	$1,555,338	$816,327
Net Income under Two-cent Rate	105,108	.....	105,108	11,453	98,481	23,610	275,746	189,932	85,814
Rate of Return	4.17		4.17				11.63	12.21	10.51
1914									
Value of Passenger Property	$2,788,674	.....	$2,788,674	$28,432	$56,563	$67,011	$2,636,668	$1,705,660	$931,008
Net Income under Two-cent Rate	128,435	17,807	146,242	5,466	134,130	85,317	371,145	246,793	124,352
Rate of Return	4.57		5.24				14.09	14.47	13.36
1915									
Value of Passenger Property	$3,006,345	.....	$3,006,345	$29,799	$56,558	$67,011	$2,852,977	$2,005,358	$847,619
Net Income under Two-cent Rate	23,769	19,097	42,866	1,769	114,480	77,879	237,004	170,214	66,790
Rate of Return	0.79		1.42				8.31	8.49	7.88
1916									
Value of Passenger Property	$2,727,368	.....	$2,727,368	$29,484	$56,915	$67,427	$2,573,542	$1,822,325	$751,217
Net Income under Two-cent Rate	76,437	18,832	95,269	6,249	106,809	74,039	269,868	192,838	77,030
Rate of Return	2.80		3.49				10.48	10.58	10.24
1917									
Value of Passenger Property	$2,589,175	.....	$2,589,175	$30,429	$57,596	$68,250	$2,432,900	$1,719,330	$713,570
Net Income under Two-cent Rate	66,513	21,899	88,412	14,961	121,758	78,794	338,073	227,814	110,259
Rate of Return	2.57		3.41				13.89	13.25	15.45

THIS PAGE BOUND VERTICAL IN BOOK

Had defendant's contentions as to the treatment of the outside operations been accepted by the Court, the conclusion must necessarily have followed that the rate prescribed by the statute was sufficient as to each of the years under investigation. The result reached by the Court was based on a calculation in which "expense voluntarily assumed by the plaintiff was charged against the regular passenger business." In other words, the district court determined that the state law should be set aside, not because of an anticipated loss arising in the particular traffic directly affected by that law, but rather because the plaintiff has deemed it good business policy to burden its operations with the sleeper and diner business for the accommodation of its interstate passengers and of connecting carriers.

V.

The District Court erred in the use of improper factors for the division of common property and common expenses, and particularly in refusing to accept the method contended for by defendants.

Insofar as it was possible so to do the accountants for the state and for the plaintiff allocated to each branch of the service the property and the expenses that could be directly so placed or charged. A large proportion of the property, however, was found to be in common use and it follows logically that a large proportion of the expense, particularly the expense incurred in the maintenance of ways and structures, must be regarded as common expense to be divided between the freight and passenger service and between interstate and intrastate traffic.

In the ordinary rate case the selection of proper factors for the division of common property and of common expense is always a matter of contention. Particularly in a passenger rate case, such as is now before the Court, the use of factors or ratios that will throw too great a proportion of the property, or the expense, to the passen-

ger traffic, is manifestly unfair. This Court laid down the rule in the

Minnesota Rate Case, 230 U. S. 352,

that "comparable use units" must be found for the purpose of making necessary divisions. The difficulty arises, however, in each case of finding such units that can be applied under the particular facts so as to do absolute justice to both the freight and passenger traffic.

In this case, as in other cases, the same factors are advanced for the division of the common expense as for the division of common property. That such double use is permissible has been, in effect, assumed by both sides. Any improper factor that is used has, therefore, a more vital bearing than it would have if limited to a single purpose. If in the instant case the factors or ratios relied on by the plaintiff and those referred to and used by the court are not the correct factors or ratios, it necessarily follows that plaintiff failed to make out its case and that the decree of the court cannot be sustained.

As above suggested, the main item of common property and common expenses is found in the so-called "Way and Structures" group. The right of way is acquired, the roadway built, the track structure constructed, the fences maintained, etc., for the use of both the freight and passenger traffic, and by far the greater part of the stations of the plaintiff company accommodate both branches of the service. For the division of such property and the expense of its maintenance, the plaintiff in this case relied on the so-called "Modified Revenue Train Mile Theory," the modification being made in order to take into account the switching movements in the two services. The district court was apparently not impressed with this theory

for he declined to accept it, using instead for the purposes of his computations the method of dividing the common property and the common expenses on the basis of certain transportation expenses directly allocated to each branch of the traffic. It should be noted in passing that there is absolutely no testimony of any kind in this regard to support the use of the latter theory, or method of division. Plaintiff did not rely on it, choosing rather to rest its case on an entirely different theory.

The revenue train mile theory, the basis of the factor relied on by the plaintiff, was, for some time immediately prior to the institution of this case, relied on by railroad companies attacking passenger rate laws. In the last few years it has fallen into disrepute, its infirmities being patent. In the final presentation of its case, the railroad company recognized the basic unsoundness of the theory by modifying the ratio. Such modification was, however, arbitrary, being based on an assumed switching mileage on common tracks (Record Vol. II page 1047).

Courts have repeatedly declined to sanction the revenue train mile as a proper and comparable use unit for the division of either common property or common expenses. Its primary defect lies in the fact that the ratio derived from such theory bears no relation to the use of the property or to the value of the use. A short passenger train, consisting of a locomotive, tender and three or four coaches, is made the equivalent of a heavy ore train pulled by a large heavy type of locomotive, and consisting of twenty or more heavily loaded cars. Since the greater part of the common property is in the Ways and Structures group, let us consider the relative use by such trains of the tract structure. Certainly, there is no comparison between the stress or wear upon the track in the two

cases. It may be argued that the higher speed of the passenger train offsets the greater weight of the freight and ore trains. In the case of a road operating at a very high rate of speed, like, for example, the New York Central, on certain parts of its system, there may be some plausibility to this argument, but in the case at bar we have no such situation. There are no fast passenger trains.

The theory also ignores the wear upon the various elements of the track structure caused by the weather. None of plaintiff's witnesses claim the factor used to be more than an approximation (Record Vol. I, page 372 and 396). That the ordinary freight train damages the track, and hence requires a greater expense for upkeep per mile than does the ordinary passenger train over the lines of the plaintiff's road, seems apparent. Not only is there a greater weight and a greater number of cars in the one instance, but the difference in construction and type of equipment is material. The flat spots permitted on the wheels of freight cars strike a blow that is detrimental to the structure and sets up a vibration, tending towards the destruction of the various elements of the track. The experimental tests to which the witness, Williams, testified (Record Vol. II pages 1110 and following) are significant in this respect. These tests demonstrated mathematically that the freight traffic causes by far the greater stress in the track structure and hence results in the greater wear.

Attention has heretofore been called to the fact that the district court did not approve of plaintiff's theory of division. In view of this fact it is, we believe, unnecessary to give it any extended discussion or analysis. The

testimony of plaintiff's own witnesses is sufficient to refute it. The witness Young said (Record Vol. I, page 282):

> "I have never testified to the propriety of the revenue train mileage basis for division of common expenses between passenger and freight before; at best that is an approximation. I do not attempt to say that the division when made states the real expense caused by the passenger or freight service."

The witness Lewis (Record Vol. II, page 755) declared that the use of the method was a matter of judgment, thus in effect admitting the absence of a legitimate foundation for it.

After expressly declaring that the method relied on by plaintiff is not a proper one, the trial court in his computations (Record Vol I, page 85) employed ratios obtained by dividing the common property and the common expenses on the basis of certain allocated expenses in the transportation group. Apparently this was done for the reason that this court in

Rowland vs. Boyle, 244 U. S. 106,

did not disapprove of such method of division. We do not understand, however, from an examination of the opinion in that case that this court intended to sanction the method as one applicable in all cases or as designed to produce fair and accurate results. Obviously, it is in the nature of an approximation. It perhaps may be employed in a case that is reasonably clear and free from uncertainties. But in the case at bar we submit that it cannot be accepted. The method in question had been used previously to the decision of the Boyle case by the Interstate Commerce Commission in the

Western Passenger Fares case, 37 I. C. C. Rep. 1.

The matter before the Commission there, however, was the legislative problem of fixing rates rather than the determination as to whether a rate established was confiscatory. The Commission seems to have followed this method for the reason that less strenuous objections were offered to it than to other theories advanced. On the other hand, it appears from the opinion of the Commission (page 19 of the same) that but little testimony was offered to support such basis. Apparently the different parties to the case did not consider it seriously. The Commission further recognized the latent defects (page 23) and declared that the use of the method in the case then under consideration "must not be regarded as conclusive on our part of the method that should ultimately be used for the division of maintenance, of way and structures expenses between passenger and freight." It was found necessary also to modify it because of operations in the yards and such modification appears to have been based on the assumption that 10% of the maintenance of way and structures expenses were incurred in the upkeep of the yards. The trial court in his opinion likewise made a modification (Record Vol. I, page 87) because of the yard expense accounts. The results appear on page 88 of the Record, and show a return on the basis employed of more than 6% on the intrastate passenger business in the year 1912, but a materially lesser rate in other years. The court expressly states that this modification is made with "patent inconsistency," thus apparently recognizing that a ratio that has to be modified by the introduction of arbitrary factors is not at all a natural method of division.

It is unquestionably true that the use of fuel, of lubricants, etc. depends to a very large extent upon the employes who are using the same. The amount of fuel used

on the different divisions of plaintiff's system must vary largely per train mile and also per ton mile. For example, a train going from Marquette to Houghton encounters some severe grades. In climbing these grades a large amount of fuel and a corresponding supply of lubricants are required. In reversing its direction, however, the grades that retarded speed and called for extra expenditure of labor and of fuel expedite the progress of the train and minimize both fuel and labor. Can it be said that the use made by the train in going on one direction is greater than the use made by the same train in making the return trip? Patently not. Following out the same line of reasoning, the run in one direction may consume a longer time than the corresponding run in the other direction because of gradient conditions. The wages of the train men vary accordingly; but is the use greater? It seems to us that the method is manifestly unfair, also in that the wages of the trainmen and the engine men in the two classes of service bear no relation to the other expenses, nor to the common property. It does not appear in this case that the same scale of pay is maintained for all such employes, for passenger engineers, firemen and conductors are paid more per hour than are the corresponding employes on the freight side. This method unduly burdens the passenger. We respectfully submit that, *insofar as this case is concerned,* there is absolutely no foundation in the record for the use of this method. There is no showing that the direct allocations are in any way indicative of the relative use of the common property or of the proper proportions of the common expense.

Without reference to the propriety of the use of the method employed by the Interstate Commerce Commission in the Western Passenger Fares case, and followed by the trial court in this case for the purpose of deter-

mining what are reasonable rates on other railroads, there are certain features peculiar to the Duluth, South Shore & Atlantic that render its application to that system manifestly improper. We have reference particularly to the unusually high mileage of exclusive freight track. We have hereinbefore, in discussing plaintiff's system, set out the mileage of main line track sidings, etc., (see page 7 of this brief). The total mileage of all tracks within the State for the year 1917 was 628.71 miles. Of this 456.20 miles was in common use; 170.41 was exclusively freight, and 2.10 exclusively passenger (Record Vol. V, page 524). In plaintiff's accounts as produced before the Master and before the court, the cost of maintenance of way and structures on the exclusive track was not segregated. Much of this track engaged in the freight service is constructed for the carrying of ore trains and must, therefore be reasonably maintained. Twelve miles of main line is exclusively freight. Any method of division that does not take into account the unusually high proportion of exclusive freight track cannot be employed in this case without unjustly burdening the passenger traffic. The Master in his report (Record Vol. III, page 496), after dividing the total expense of the maintenance of way and structures, made a modification by deducting from the proportion of the income assigned to passenger the sum of $21,664.34. As appears from the Master's tabulation certain of the accounts in the group were divided on the basis of 37.70% to the passenger, while others assigned 42.36% to passenger, the average percentage used being slightly in excess of 40%. The sum deducted, therefore, represents approximately 40% of what the Master considered to be the cost of maintenance of ways and structures on the exclusive freight track for the year 1912. In other words, such expense was determined by

him to be in excess of $50,000. A similar adjustment was made by the Master for the year 1913 (Record Vol. III, page 500).

The accountants for the State, Mr. Hillman and Mr. Parker, made a careful and detailed examination of the records of the Railroad Company for the purpose of determining, if possible, the relative cost of maintenance of spurs, sidings, etc., as compared with main line track. The nature of the adjustment arrived at and the method pursued in the investigation is set forth in the testimony of Mr. Hillman (Rec. Vol. II, page 1137) as follows:

> "As it costs more per mile to maintain main track than sidetrack, the question became the proportion between the two. We adjusted the mileage by treating the main track as two and the sidetrack as one, on the basis that it costs $2.00 to maintain a main track as against $1.00 for a sidetrack. To be liberal, we used this ratio, though our investigations indicated $1.50 per main track mile to $1.00 per sidetrack mile. In my investigations to determine this ratio, I found the road divided into sections, each in charge of a gang. I assigned the actual expenses of maintenance incurred on each section to the section; I then went over the blueprints of sections and took off the percentage of side and main tracks on each section; I then classified the sections, combining all those having 95 to 100% main track, then those having 90 to 95% main track, then those having 80 to 90% main track, and so on, classifying the sections until I came to the other end, where there was less than 10% main track or the bulk of the work was on sidetracks. This gave a series of equations showing how the expenses would be affected by the admix-

ture of sidetrack with main track or main track with sidetrack, as my sections were scattered all over the road and represented all conditions of the traffic, because the sections having these percentages were not contiguous; they were scattered. I then equated the track and worked out the percentage which would be indicated by the admixture of the different classes of track. The highest percentage that I could obtain by any combination in the whole series was 172%, indicating that for every dollar expended on sidetrack per mile there would be $1.72 on main track. When we combined the results for the four years, the combination of all our percentages and equations gave us $1.49 per main track mile, against $1.00 per sidetrack mile. These figures are derived from the actual operations of company and their actual book charges."

As stated by the witness, the accountants for the state made the adjustment on the basis that it costs twice as much to maintain main track as to maintain sidetracks. In view of the actual figures disclosed by the investigation, this was more than fair to the freight traffic. The resultant figures obtained from this adjustment are shown in Mr. Parker's Exhibit (Record Vol. V, page 524). The equated mileage of common track for the year 1917 comprised 82.52% of the total; the exclusive freight track 17.28%; and the exclusive passenger track .20%. In other words, over 17% of the total expense of maintenance of way and structures was incurred on exclusive freight traffic. Before the common expense can be divided this freight expense must be set out. Likewise, the very small percent of exclusive passenger expense must be separated. The accountants for the state in their

computations did this, thus presenting the only showing in the case that can be said to rest on any sound or logical basis.

That some adjustment must be made of the character worked out by the state's accountants is clearly shown by the record. Witnesses for the plaintiff conceded it. Prof. Riggs, who was the appellant's leading witness before the Master, spoke on the subject several times (Record Vol. 1, pages 165, 166, 174, 207, 209, 210, 212). On page 210 of the record he said:

> "I think, in general, it is fair to say that on any secondary track the maintenance per mile is less than main line track. The practice of many railroads is to consider 2 or 2.5 miles of secondary track or siding equivalent to a mile of main line in arriving at an average figure per mile on maintenance, and some of these tracks will unquestionably have very little money spent upon them annually for maitenance while others will have a very considerable amount. I would expect to find much more money spent per mile upon such a line as Palmer Branch than upon Deranson lumber spur or other lumber spurs on west end.
>
> On such lines as Palmer Branch there are a large number of movements and they are in the sense of mine movements over them. There is considerable operation on those tracks and there might be more frequent movement and more tonnage over them than on some parts of the main line; e. g., parts of the line west of Nestoria; I don't think that would apply to the whole line. Other parts of the line have nothing over them but regular trains, while the mine spurs have a large movement of ore from the lines to the main line."

Likewise, plaintiff's witness Young testified (Record Vol. 1, page 290):

> "I did not have in mind making this division, that these branches, such as traffic spurs, industry tracks, etc., over which no train mileage is made, were included in this maintenance. I thought they were and that they ought to be set apart to freight."

Of special significance and tending to squarely support the adjustment made by Mr. Hillman and Mr. Parker is the testimony of plaintiff's accountant, Mr. Delf (Record Vol. 1, page 420). Referring to the contentions of the Duluth, South Shore & Atlantic Railway Company in a proceeding affecting its ore rates, he said:

> "I assumed an average maintenance of $500 per mile for exclusive ore trackage covering items of expense under the maintenance of way and structures group. I assumed those expenses covered all that pertained to the ore business; there might be other expenses of those tracks, but we assigned no others to the ore business; we treated those track expenses as the equivalent of $500 a mile. For the entire trackage of the Houghton division I found an actual expenditure for the same items of $913.91 per mile."

Bearing in mind that the heaviest traffic on plaintiff's system is over the Houghton division, and that in consequence the highest expenses for the maintenance of way and structures may be expected there, it is patent that the ratio of maintenance used by the state's accountants (that is regarding two miles of side or branch track as the equivalent of one mile of main track) is not unfavorable to the freight traffic.

It is possible that in the ordinary case the proportion of common track used in each service is approximately the same as the relative use of the common track and structures. If such is the fact, then the case at bar is clearly an exception and factors or ratios of division must be employed accordingly. We repeat that no factor or ratio that ignores this abnormal percentage of exclusively freight track can properly be used. We insist that both the modified revenue train mile theory of division and the so-called western passenger fares case method employed by the court must be rejected.

On the trial defendants relied in the court below on the so-called gross-ton-mile theory as furnishing the proper basis for the division of those parts of the common property, the constant renewal and upkeep of which is made necessary principally by the element of wear. As before stated, the computations of the accountants were based on the equated track mileage. The actual ratio is obtained by multiplying the gross weight in each service by the mileage in the period under consideration. The method as applied rests for its support on the fact that the expense of maintaining the property (rather those parts of the property to which the factor is applied) is due to the wear, and that the wear is caused by the tonnage passing over the track structure. That, as between the two traffics, the wear varies in proportion to gross weight seems to us to be a logical deduction. The heavier the train the greater the tractive force that the locomotive must exert, and the greater the strain on the track. This was the method employed by defendant's witness Hillman, and his reasons are set out fully in his testimony (Record Vol. II, pages 1138-1139). See also testimony of witness Thompson (Record Vol. II, pages 846, 848).

The results of the application of the gross-ton-mile method of division, as used by Mr. Hillman, are shown for each of the years, 1914 to 1917 inclusive, in his exhibit Volume IV of the Record. In addition to offering this proof defendants introduced in evidence also exhibits based on a combination of the gross-ton-mile theory with the so-called time of use theory. This method was employed by Mr. Thompson and Mr. Parker. It rests on the theory that common wear expense should be divided on the gross ton mile ratio, and the so-called weather expenses on the time of use theory. Basically, it would not seem to be absolutely required that expenses caused by wear should be divided in precisely the same manner as are expenses due to the passage of time and the action of the elements. Each service uses the common property for a certain portion of each day. The parts, or elements, of the property that must be maintained from time to time, replaced because of weather stress, are necessary for the use of both passenger and the freight, and it does not seem to us to be illogical to make the division on the basis of the time used in each traffic. The so-called Parker exhibit, Volume V of the Record, contains the results obtained for the years 1914, 1915, 1916 and 1917, from the use of this method, or rather combinations of methods. The results thus obtained do not differ materially from those shown by the application of the gross ton mile ratio, thus tending to confirm the latter method.

By way of illustration, let us consider the division of the cost of upkeep of the fencing along the right of way. Plaintiff would divide such cost on the revenue train mile basis, but obviously there is no relation. Neither is there any connection between the value of the fence or the expense of maintenance and the direct charges for wages, fuel, lubricants, etc., that can be made against the two forms of traffic. The fences are there for the protection

of each traffic during the time that it is using the common property. What is true of the fence is equally true of other property that is not destroyed by wear, but which deteriorates from the weather. With reference to the use of this method, we call attention to the testimony of Mr. Thompson and Mr. Parker (Record, Thompson, Vol. II, page 848; Parker, Vol. II, pages 1078, 1079).

On the basis of either of the methods presented by the defendants the plaintiff, during all of the years under investigation received a fair and reasonable return upon the property devoted to the intrastate passenger traffic. The results so obtained are shown in the following tabulations which we have inserted for the convenience of the court. Each computation starts with the Michigan proportion of expenses as used by the trial court as the basis for the results shown in his opinion. The property is divided on the ton mile factor and assignments to passenger and freight are on the basis of equated track and ton miles. The property assigned to the auxiliary operations, that is, mail and express, sleepers and diners, includes merely the cars and a proportion of working capital and of stores and supplies. Deficits are shown in bold faced type. The first computation indicates the result of assigning to each of the outside operations its full proportion of the expenses. In the second computation, it has been assumed that certain of the passenger service expenses would be incurred if the auxiliary operations were not conducted. Therefore, these constant costs have been made and charged upon the passenger and baggage service, no part thereof being assigned to the sleepers, diners, mail and express. In both cases, the passenger and baggage portion of the expenses has been assigned to intrastate and interstate in exactly the same manner as was employed by the trial judge. The results are as follows:

	Total Michigan Passenger	Mineral Range	D.S.S.& A. Passenger	Mail & Express	Sleepers	Diners	Passengers and Baggage Total	Intra.	Inter.
1912									
Value of Passenger Property	$2,428,691	.....	$2,428,691	$27,723	$56,647	$67,121	$2,277,200	$1,448,982	$828,218
Net Income under Two-cent Rate	174,744	.....	174,744	23,950	87,939	40,742	279,475	194,494	84,981
Rate of Return	7.18		7.18				12.27	13.42	10.26
1913									
Value of Passenger Property	$2,514,189	.....	$2,514,189	$27,722	$56,647	$67,117	$2,362,703	$1,549,641	$813,062
Net Income under Two-cent Rate	147,184	.....	147,184	16,231	91,564	79,027	301,544	208,819	92,725
Rate of Return	5.85		5.85				12.76	14.19	11.40
1914									
Value of Passenger Property	$2,625,072	.....	$2,625,072	$28,429	$56,565	$67,011	$2,473,067	$1,599,827	$873,240
Net Income under Two-cent Rate	191,283	17,794	209,077	2,205	121,922	79,036	407,830	272,987	134,843
Rate of Return	7.58		7.97				16.53	17.06	15.44
1915									
Value of Passenger Property	$2,764,880	.....	$2,764,880	$29,802	$56,562	$67,007	$2,611,509	$1,835,629	$775,880
Net Income under Two-cent Rate	82,177	19,077	101,274	5,415	103,931	72,210	272,000	196,930	75,070
Rate of Return	2.97		3.66				10.42	10.73	9.68
1916									
Value of Passenger Property	$2,470,757	.....	$2,470,757	$29,482	$56,909	$67,427	$2,316,939	$1,640,625	$676,314
Net Income under Two-cent Rate	129,606	18,848	148,454	12,782	96,829	68,783	301,284	216,611	84,673
Rate of Return	5.25		6.01				13.00	13.20	12.52
1917									
Value of Passenger Property	$2,368,066	.....	$2,368,066	$30,419	$55,598	$68,242	$2,211,807	$1,563,084	$648,723
Net Income under Two-cent Rate	129,213	21,921	151,134	7,279	110,188	73,160	375,909	256,660	119,249
Rate of Return	5.46		6.38				17.00	16.41	18.38

THIS PAGE BOUND

	Total Michigan Passenger	Mineral Range	D.S.S.& A. Passenger	Mail & Express	Sleepers	Diners	Passengers and Baggage Total	Intra.	Inter.
1913									
Value of Passenger Property	$2,428,691	.....	$2,428,691	$27,723	$56,547	$67,121	$2,277,200	$1,448,982	$828,182
Net Income under Two-cent Rate	174,744	.....	174,744	43,283	40,685	27,836	208,982	149,640	59,242
Rate of Return	7.18		7.18				9.22	10.33	7.17
1918									
Value of Passenger Property	$2,514,189	.....	$2,514,189	$27,722	$56,647	$67,117	$2,362,703	$1,549,641	$813,062
Net Income under Two-cent Rate	147,184	.....	147,184	37,418	53,196	53,441	216,293	152,908	63,485
Rate of Return	5.85		5.85				9.16	9.87	7.81
1914									
Value of Passenger Property	$2,625,072	.....	$2,625,072	$28,429	$56,565	$67,011	$2,473,067	$1,599,827	$873,240
Net Income under Two-cent Rate	191,283	17,794	209,077	26,917	74,504	54,540	311,204	210,479	100,725
Rate of Return	7.58		7.97				12.58	13.16	11.54
1915									
Value of Passenger Property	$2,764,880	.....	$2,764,880	$29,802	$56,562	$67,007	$2,611,509	$1,835,629	$775,880
Net Income under Two-cent Rate	82,177	19,097	101,274	29,668	89,739	48,714	180,059	132,306	47,754
Rate of Return	2.97		3.66				6.89	7.20	6.15
1916									
Value of Passenger Property	$2,470,757	.....	$2,470,757	$29,482	$56,909	$67,427	$2,316,989	$1,640,625	$676,314
Net Income under Two-cent Rate	129,606	18,848	148,454	33,875	40,233	43,986	268,397	147,307	56,090
Rate of Return	5.25		6.01				8.79	9.00	8.29
1917									
Value of Passenger Property	$2,368,066	.....	$2,368,066	$30,419	$55,598	$68,242	$2,211,807	$1,563,084	$648,722
Net Income under Two-cent Rate	139,318	21,821	161,134	18,070	63,544	51,550	281,306	189,794	91,512
Rate of Return	5.46		6.38				12.72	12.14	14.11

THIS PAGE BOUND VERTICAL IN BOOK

We believe that the methods of division advanced by the appellants are logical and that the computations fairly show the proper proportion of common property and common expenses that should be charged to each traffic. Defendant's showing being based on the equated track mileage is not open to the charge that it does not take into account the cost of maintenance of exclusive freight and passenger tracks. It seems to us that the court properly refused to accept plaintiff's theory of division; and that he was not justified in going wholly outside of the record for the purpose of obtaining another distinct method. For the reasons pointed out such method so obtained is not a proper one as applied to the operations of plaintiff's railroad and, therefore, its use by the court was error for which the decree should be reversed.

VI.

The Court erred in determining that the plaintiff had overcome by proper proof the presumption of validity and had established confiscation.

An act of a legislative body establishing a rate to be charged by a common carrier is presumed to be valid, unless and until its invalidity is clearly shown by competent and adequate proof. Every legislative act has attached to it the presumption of validity; but in the case of a rate fixing law the presumption is stronger than in ordinary cases. The fixing of a rate in the first instance implies an investigation into facts, and a conclusion on the part of the legislative body that, as a matter of fact the rate established is just and reasonable to the carrier as well as to the public. This determination is not to be lightly disregarded; nor is it to be overlooked that the public using the facilities of the carrier have a direct and vital interest in the matter. These, and other factors, all have a tendency to strengthen the ordinary presumption of validity. In the instant case there are a number of factors involved that tend to render highly uncertain and conjectural the case presented by the plaintiff company.

Some of these matters we have already called to the attention of the court. We have discussed the existence of two parallel lines between Marquette and Ishpeming; and the so-called Western Division. As to these we are confronted with the certainty that if the system were to be rebuilt today the South Line would be omitted and the Western Division would be differently located, if it were built at all. We have also pointed out the result of the operations of the plaintiff company over the line of the Mineral Range, the result being to burden plaintiff's intrastate passenger business. Brief mention has also been made of the construction of the Lake Superior and Ishpeming Railroad and of the competition that plaintiff suffers from that road in the ore traffic.

In order to overcome the uncertainty arising from the foregoing, and other circumstances disclosed by the record, it was incumbent on the plaintiff to establish its case by such degree of proof as can leave no reasonable chance for doubt. Can it be said on this record that plaintiff has met this obligation? Has it shown by clear and convincing proof that confiscation of its property would have resulted in all of the years under investigation had the two cent fare law been put in effect as to its intrastate passenger business? We submit not. Erroneous factors of division of common property and common expense that were used and the improper charging to the passenger business of property and expense that should not have been so charged are in themselves sufficient to defeat plaintiff's case. If plaintiff's underlying theories were not sound, it cannot be held to have overcome the presumption attaching to the act assailed.

In the

Minnesota Rate Case, 230 U. S. 352,

it was said by this court in commenting upon the nature of the proof adduced:

> "We are of opinion that on an issue of this character involving the constitutional validity of state action, general estimates of the sort here submitted with respect to a subject so intricate and important should be not accepted as adequate proof to sustain a finding of confiscation. While accounts have not been kept so as to show the relative cost of interstate and intrastate business giving particulars of the traffic handled on through and local trains, and presenting data from which such extra cost as there may be of intrastate business may be suitably determined, it would appear to have been not impracticable to have had such accounts kept or statistics prepared at least during test periods properly selected. It may be said that this would have been a very difficult matter. But the company having assailed the constitutionality of the State Acts and orders was bound to establish its case and it was not entitled to rest on expressions of judgment when it had it in its power to present accurate data which would permit the court to draw the right conclusion."

In the earlier case of

San Diego Land Co. vs. National City, 174 U. S. 739,

the rule of law with respect to the burden of proof arising upon a party assailing a rate law was declared in

even more emphatic terms. We wish to quote from the opinion in that case as follows:

"It should also be remembered that the judiciary ought not to interfere with the collection of rates established under legislative sanction unless they are so plainly and palpably unreasonable as to make their enforcement equivalent to the taking of property for public use without such compensation as under all the circumstances is just both to the owner and to the public; that is, judicial interference should never occur unless the case presents clearly and beyond all doubt, such a flagrant attack upon the rights of property under the guise of regulation as to compel the court to say that the rates prescribed will necessarily have the effect to deny just compensation for private property taken for the public use. *Chicago & Grand Trunk Ry. vs. Well*, Am. 143 U. S. 339, 344; *Reagan vs. Farmers' Loan & Trust Co.*, 154 U. S. 362, 399; *Smyth vs. Ames*, above cited. See also *Henderson Bridge Co. vs. Henderson City*, 173 U. S. 592, 615.

In view of these principles, can it be said that the rates in question are so unreasonable as to call for judicial interference in behalf of the appellant? Such a question is always an embarrassing one to a judicial tribunal, because it is primarily for the determination of the legislature or of some public agency designated by it. But when it is alleged that a state enactment invades or destroys rights secured by the constitution of the United States a judicial question arises, and the courts, Federal and state, must meet the issue, taking care always not to entrench upon the authority belonging to a different department, nor to disregard a statute

unless it be unmistakably repugnant to the fundamental law.

What elements are involved in the general inquiry as to the reasonableness of rates established by law for the use of property by the public? This question received much consideration in *Smyth vs. Ames*, above cited. That case, it is true, related to rates established by a statute of Nebraska for railroad companies doing business in that state. But the principles involved in such a case are applicable to the present case. It was there contended that a railroad company was entitled to exact such charges for transportation as would enable it at all times, not only to pay operating expenses, but to meet the interest regularly accruing upon all its outstanding obligations and justify a dividend upon all its stock; and that to prohibit it from maintaining rates or charges for transportation adequate to all those ends would be a deprivation of property without due process of law, and a denial of the equal protection of the laws. After observing that this broad proposition involved a misconception of the relations between the public and a railroad corporation, that such a corporation war created for public purposes and performed a function of the state, and that its right to exercise the power of eminent domain and to charge tolls was given primarily for the benefit of the public this court said: 'It cannot, therefore, be admitted that a railroad corporation maintaining a highway under the authority of the state may fix its rates with a view solely to its own interests, and ignore the rights of the public. But the rights of the public would be ignored if

rates for the transportation of persons or property on a railroad are exacted without reference to the fair value of the services rendered, but in order simply that the corporation may meet operating expenses, pay the interest on its obligations, and declare a dividend to stockholders. If a railroad corporation has bonded its property for an amount that exceeds its fair value, or if its capitalization is largely fictitious, it may not impose upon the public the burden of such increased rates as may be required for the purpose of realizing profits upon such excessive valuation or fictitious capitalization; and the apparent value of the property and franchises used by the corporation, as represented by its stocks, bonds and obligations is not alone to be considered when determining the rates that may be reasonably charged.' 169 U. S. 544. In the same case it was also said that 'the basis of all calculation as to the reasonableness of rates to be charged by a corporation maintaining a highway under legislative sanction must be the fair value of the property used by it for the convenience of the public. And in order to ascertain that value, the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stock, the present as compared with the original cost of construction, the probable earning capacity of the property under particular rates prescribed by statute, and the sum required to meet operating expenses, are all matters for consideration, and are to be given such weight as may be just and right in each case. We do not say that there may not be other matters to be regarded in estimating

the value of the property. What the company is entitled to ask is a fair return upon the value of that which it employs for the public convenience. On the other hand, what the public is entitled to demand is that no more be exacted from it for the use of a public highway than the services rendered by it are reasonably worth.' 169 U. S. 466, 546."

We wish to call attention also to the case of

Wilcox vs. Consolidated Gas Co., 212 U. S. 19,

which may be regarded as a close one upon the issue of confiscation. There, as here, the rate had not been put into effect. The testimony produced was conflicting, and the opinion of the experts employed by the parties were not in accord. The court there said:

"In such a case as this where the other data upon which the computation of the rate of return must be based, are, from the evidence, so uncertain, and where the margin between possible confiscation and valid regulation is so narrow, we cannot say there is no fair or just doubt about the truth of the allegation that the rates are insufficient. * * *

Upon a careful consideration of the case before us we are of the opinion that the complainant has failed to sustain the burden cast upon it of showing beyond any just or fair doubt that the acts of the legislature of the state of New York are in fact confiscatory."

Numerous other cases might be cited to the same effect, but there can be no question as to the rule. All reasonable doubts as to the validity of legislative action in the establishment of rates must be resolved in favor of the statute, rather than against it. As stated in the Con-

solidated Gas Company case, the confiscatory character of such rates must be shown "beyond any just or fair doubt." The cases in which the matter has been discussed are well summarized in

4 R. C. L., page 632,

in the following language:

> "Where the question of reasonableness of rates fixed by legislative act, either directly by the legislature or through the agency of a body such as a railroad commission, is presented for judicial review, it is clearly established that the presumption of reasonableness accompanies the legislative act. This presumption has been treated lightly in some cases, being viewed as no more than the ordinary presumption in favor of acts of legislation, and possessed of no special strength or sanctity, a presumption that slight evidence would rebut, but the better and much more generally expressed doctrine places upon the carrier the necessity of showing that the statute clearly, or, as some courts say, palpably or beyond a reasonable doubt, is invalid, or, in other words, a commission's findings of fact should not be disturbed unless clear and unmistakable error is shown. This burden continues at every stage of the inquiry and in respect to all matters affecting the earning capacity of the carrier, its fixed charge, the operating expenses, sources of revenue, and the value of property itself."

An examination of the entire record, a consideration of the conflicting testimony introduced and an analysis of the divergent theories advanced will not, we believe, warrant the conclusion that plaintiff adequately met the

burden of proof resting on it. On the contrary we insist that the defendants established by affirmative showing that the two cent rate, if put in operation, would not have been confiscatory during any of the years from 1912 to 1917 inclusive. The state did not take the position here, as has been done in some instances, of merely attempting to discredit the showing made by the railroad company. The issues presented were met in all instances in the spirit of fairness, and with the purpose in mind of determining the true fact. If it were purely a question of weighing testimony, it seems to us that the preponderance must be adjudged to lie with the state.

In his opinion the district court did not specify the minimum rate that he regarded as non-confiscatory. He went no further in this respect than to assume that the rates of return for the different years, as shown in the computations made by him, were not sufficient to yield a fair return on the property devoted to the intrastate passenger business. It is our contention that a return equaling or approximating the statutory rate of interest cannot in any event be held so inadequate as to justify the nullification of a state law. That rate in Michigan is five per cent. As we read the cases there seems to be a decided tendency to take the legislative rate as the criterion. Thus in

Willcox vs. Consolidated Gas Co., 212 U. S. 19,

it was indicated that a return of six per cent would be a fair one. The statutory rate in New York at that time was six per cent. The same conclusion was reached in the

Denver Water Company Case, 246 U. S. 178,

the rate of interest in Colorado being likewise six per cent. In a number of instances statutes or ordinances

permitting a return substantially less than the statutory rate have been upheld. In California such rate is seven per cent; but in

Stanislaus Co. vs. San Joaquin Co. & I. Co., 192 U. S. 201,

it was held that rates permitting a return of six per cent upon the value of the property actually used were not open to attack. To the same effect is

San Diego Land & Town Co. vs. Jasper, 189 U. S. 439.

The foregoing and numerous other cases that might be cited, clearly show the trend of decisions. A rate permitting a carrier to earn a return approximately equal to the rate of interest prescribed by the statute is not confiscatory. Measured by this test the rate of return on the intrastate passenger business for the year 1912, as shown in the court's computation (Record Vol. I, page 88) was adequate and the rate of return for each of the years 1913 and 1914 was so close to the statutory rate as not to warrant a judicial determination of confiscation.

If defendants are correct in any of the main propositions that we have advanced, and on which we rely, the plaintiff would have received during each of the years investigated, under the operation of the two cent law, a reasonable and fair return on that portion of its property devoted to the intrastate passenger business.

We have hereinbefore called attention to the fact that the two cent rate was never put in operation by the plaintiff company. It was the only carrier in the State of Michigan, subject to the two cent law, that did not comply with it. It seems reasonable to believe that had the rate been

reduced from three to two cents, traffic would have been increased, to some extent at least. We desire to call attention in this connection to the testimony of Prof. Adams (Record Vol. II, page 1134), who referred to the corresponding reduction of rates on the Michigan Central and the stimulation of traffic that followed. Mr. Hillman (Record Vol. II, page 1158) spoke of another instance of the same character affecting the Louisville and Nashville Railroad Company.

This probable increase in travel under the reduced rate is a matter that should not be ignored in the determination of this case. It cannot fail to raise a doubt as to the propriety of the assumption that the reduction in revenue following the installation of the reduced rate can be accurately measured in dollars and cents. Both the plaintiff and the district court found it necessary to make this assumption. In fairness, however, it must be said that we do not know, nor does anyone know, what results would follow an actual change in rate from three to two cents. The element of speculation in this regard necessarily enters into plaintiff's case and must be taken into account.

In conclusion, we respectfully insist that the objections raised to the decree of the court below are each and all well taken, and that the case should be reversed. It is apparent from the computations included herein that the property values can be very materially increased and the rate of return under the two cent fare law is still shown to be non-confiscatory. Plaintiff has not only failed to establish its case by the requisite degree and character of proof, but the defendants have shown on this record that the rate prescribed by the statute is, as applied to the

plaintiff's road, a fair one. We ask, therefore, that the decree of the district court be reversed.

Respectfully submitted,

ALEX. J. GROESBECK,
Attorney General,
Attorney for Defendants and Appellants.

ROGER I. WYKES and
LELAND W. CARR,
Of Counsel.

SUBJECT INDEX.

	PAGE
Nature of Controversy	1
History of the Case	2
Location and History of Plaintiff's Railroad	5
General Principles of Law	10
The Issues of Fact	13
Valuation	13
Division of Property Values between Passenger and Freight	14
Analysis of Results of Different Methods of Division	21
Revenue Train Mile Ratio as Modified	23
Division of Passenger Property between Intrastate and Interstate	26
Division of Revenues and Expenses	26
Revenues	27
Operating Expenses	28
Division of Operating Expenses between States	29
Michigan Operating Expenses	29
Division of Michigan Operating Expenses between Passenger and Freight	29
Division of Expenses of Maintenance of Way and Structures	30
Division of Common Expenses of Maintenance of Way	36
Expenses of "Station Employees" and "Dispatching Trains"	43
Division of Michigan Passenger Operating Expenses between Intrastate and Interstate	46
Other Deductions from Income	49
Estimated Loss under the Act Complained of	50
Sleepers and Diners	56
Mail and Express	69
Mineral Range Railroad	77
Western Division	81
South Line from Marquette to Ishpeming	81
Net Results from Plaintiff's Intrastate Passenger Operations	84
Appendix—Copy of Statute in Question	95

TABLE OF CASES CITED.

	PAGE
Atlantic Coast Line *vs.* North Carolina Corporation, 206 U. S. 1	61
C. B. & Q. Ry. Co. *vs.* R. R. Com'n of Wisconsin, 237 U. S. 220	61
Chesapeake & Ohio Ry. Co. *vs.* Public Service Commission, (W. V.), 89 S. E. 844	60
Five Per Cent Case, 31 I. C. C. Rep. 351	
Michigan Copper & Brass Co. *vs.* D. S. S. & A. Ry. Co. et al., 25 I. C. C. Rep. 357, at p. 363	8
Michigan Statutes.	
Compiled Laws of 1917, Section 8112	61
Compiled Laws of 1897, Sections 5252–3	62
3 Howells Statutes (2nd Ed.) Section 6696	66
Public Acts of 1911—Act No. 256	95
Minnesota Rate Cases, 230 U. S. 352	12, 15, 94
Norfolk & Western Ry. Co. *vs.* West Virginia, 236 U. S. 605	12
Northern Pacific Railroad *vs.* North Dakota, 236 U. S. 585	74
Rowland *vs.* Boyle, 244 U. S. 106	31, 35, 48, 51, 56
Santa Clara Co. *vs.* Southern Pacific R. R. Co., 118 U. S. 394 (p. 396)	11
State ex rel. M. R. Ry. Co. *vs.* Atkinson (Mo.), 192 S. W. 86	60
U. S. Constitution.	
Article I, Section 2	10
Article I, Section 8	11
Article I, Section 10	11
14th Amendment	11
Wellman *vs.* Chic. Grand Trunk Ry. Co., 83 Mich. 592	8
Western Passenger Fares Case, 37 I. C. C. Rep. 1	22, 37

REFERENCES TO RECORD.

The Record, as printed, consists of seven volumes.

Volume I (pages 1-576) contains the pleadings, and all court orders, etc., and a portion of the testimony.

Volume II (pages 577-1195) contains the remainder of the testimony and certain of the plaintiff's exhibits.

Volume III (separately paged) contains the report of the Special Master.

Volume IV (separately paged) contains a comparison of the valuation exhibits of the plaintiff and of the defendants.

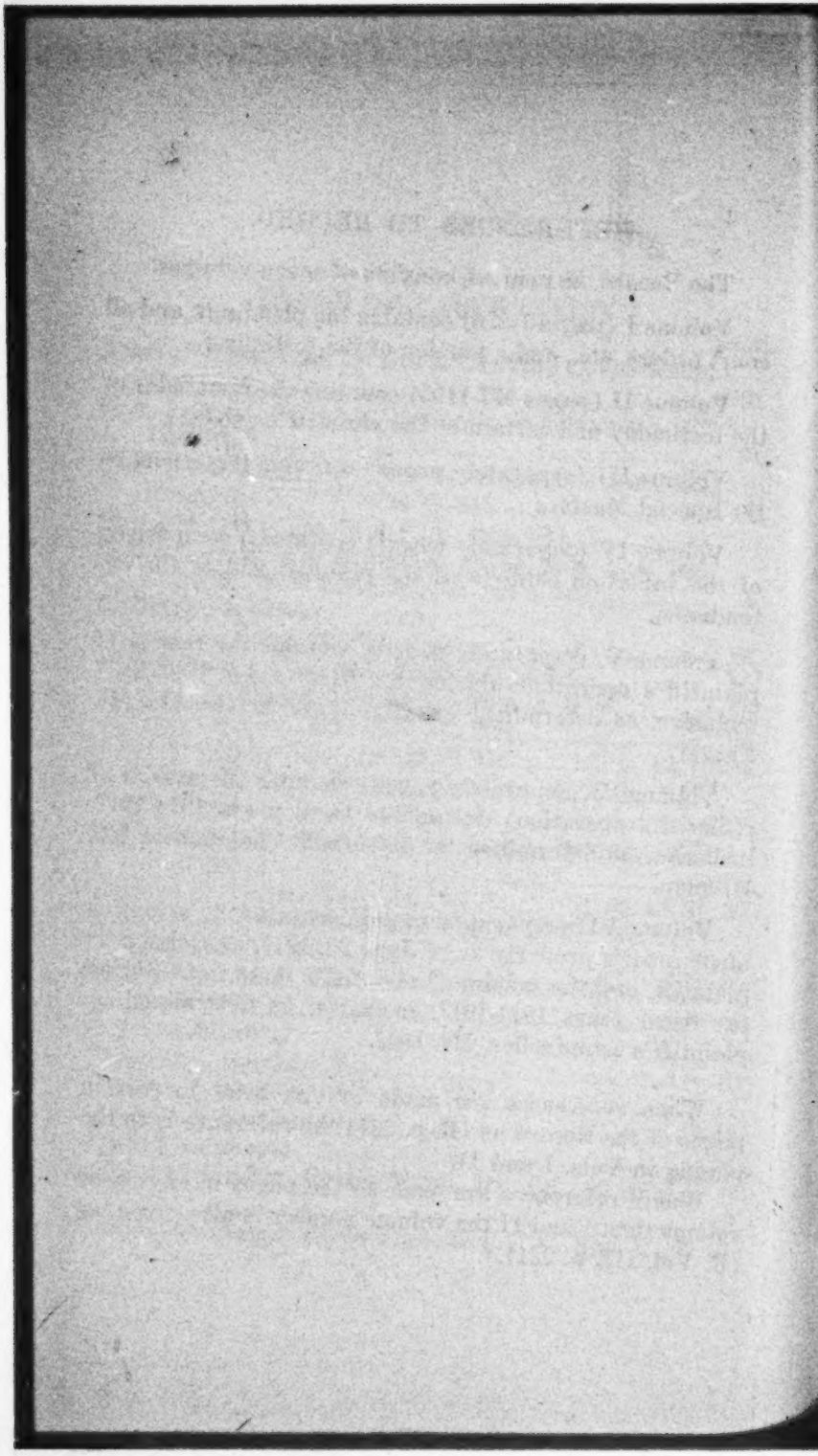
Volume V. (separately paged) contains the results of plaintiff's operations during the fiscal years 1914-1917, inclusive, as determined by defendants' accountant Mr. Parker.

Volume VI (separately paged) contains the results of plaintiff's operations during the fiscal years 1914-1917, inclusive, as determined by defendants' accountant Mr. Hillman.

Volume VII (separately paged) contains the valuation of plaintiff's property as of June 30, 1917, as claimed by plaintiff, and the results of plaintiff's operations during the fiscal years 1914-1917, inclusive, as determined by plaintiff's comptroller, Mr. Delf.

When references are made in this brief to certain pages of the Record as (R. p. 221) the reference is to the paging in Vols. I and II.

Where references are made to the pages in any other volume than I and II the volume number is also given, as (R. Vol. III, p. 221).



DULUTH, SOUTH SHORE & ATLANTIC RAILWAY.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY.

IN THE

Supreme Court of the United States.

OCTOBER TERM, 1918.

ALEX J. GROESBECK, CASSIUS S. GLASCOW, CHARLES S. CUNNINGHAM and ADDISON L. KEISER,
Defendants and Appellants,

vs.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY,
Plaintiff and Appellee.

No. 759.

BRIEF FOR PLAINTIFF AND APPELLEE.

NATURE OF CONTROVERSY.

This is an appeal from a decree of the District Court of the United States for the Eastern District of Michigan, enjoining the defendants and appellants, who are the Attorney General and the Members of the Railroad Commission of the State of Michigan, from enforcing against the plaintiff and appellee the provisions of the so-called Michigan two-cent passenger fare law. Since the appeal was taken the Michigan legislature has repealed the act in question (see Public Acts of Michigan for 1919, Act 382) and this would now be a moot case if it were not that there is still at issue between the parties the question of the validity of certain refund coupons issued by the plaintiff during the period of the litigation under the provisions of a certain temporary restraining order.

History of the Case.

Under the Constitution of the State of Michigan, the Legislature is granted authority to "pass laws establishing reasonable maximum rates of charges for the transportation of passengers and freight on different railroads in this State." Art. XII, Sec. 7, Mich. Constitution.

Under such authority the Legislature has for many years past prescribed maximum passenger rates on the different railroads in the state, prescribing one rate for certain classes of roads in the lower peninsula, and a higher rate for similar classes of roads in the upper peninsula, the reason for the difference in rate being that the upper peninsula is much more sparsely settled, and that this lower density of population and the more severe climatic conditions in the upper peninsula make railroad operations there much more difficult and expensive than in the lower peninsula. Prior to 1889 the maximum rate fixed by law for adult passengers was 3¢ a mile in the lower peninsula and 5¢ a mile in the upper peninsula; from 1889 to 1907, the rates were respectively 2½¢ and 4¢ a mile; in 1907 they were reduced to 2¢ and 3¢ per mile respectively; and in 1911 the Legislature passed Act. No. 276, being the statute complained of in this case, making the rate for all companies in the state, the gross earnings of whose passenger trains equalled or exceeded $1,200 per mile of road operated by such company, on which regular passenger service was maintained, 2¢ per mile. The exact provisions of the statute are more fully set out in the bill of complaint in this case (R. p. 3), and the text of the statute is printed as an appendix to this brief.

Thereupon the plaintiff filed its bill of complaint against the then attorney general and the then respective commissioners constituting the Michigan Railroad Commission, and against three individuals who were alleged to be persons accustomed and intending in the future to

use plaintiff's railroad. Against the officials above named, it was sought to restrain them from attempting to enforce Act 276; while the individual defendants were joined in the case as representing the public. All of the defendants appeared by the attorney general.

Upon the filing of the bill an application for an interlocutory injunction was made, and pending the hearing upon such application a restraining order was issued. For reasons which need not be stated, no complete hearing was ever had or decision made upon the application for a temporary injunction; but by consent, the original restraining order was continued in force up to the entry of the final decree. Pursuant to stipulation, and by order of court, the restraining order was conditioned that plaintiff should issue to each person buying Michigan intrastate passenger transportation, a receipt or certificate by which it should bind itself to refund to the holder thereof the excess fare paid if the validity of the statute finally should be sustained. The redemption of the rebate receipt and the repayment of the excess fares were required to be secured, at first, by a bond for $200,000, and later, in addition to the bond, by the deposit of the moneys so received in designated banks subject to the order of the court. The fund so on deposit now amounts to the sum of $815,585.83, the disposition of which depends upon the final outcome of this suit.

In May, 1912, the case was referred to Herbert L. Baker, Esq., of Detroit, as a Special Master, to take the proofs, to make the necessary computations, to find and state the facts and to report his findings and recommendations to the court. At intervals during a considerable period of time very extensive proofs were taken, the testimony, aside from any exhibits, covering more than twelve thousand typewritten pages. The transactions and operations of plaintiff in the four fiscal years 1910 to 1913, including its revenues, receipts, and expenditures in each

of those years, and also the condition and value of the property employed in each branch of its service, were inquired into and examined in minute detail. Elaborate schedules, tables and computations based upon the theories and formulas of eminent engineers and expert accountants were presented. Voluminous briefs were filed and lengthy oral arguments were had, and the case was finally submitted to the Master about March 1, 1915. About June 1, 1916, the Master furnished counsel with a draft of his proposed report to which he invited their criticisms and objections, and after fully considering all such criticisms and objections, on February 1, 1917, the Master filed his final report, which appears as volume III of the Record. In this report the Master found that the enforcement against the plaintiff of the act complained of would result in the confiscation of plaintiff's property, and recommended that a decree be entered in favor of the plaintiff for the relief sought. To this report both parties filed exceptions, and, the judge of the Eastern District of Michigan, where the case was pending, having expressed himself as disqualified from hearing the case on the ground that he had been a member of the Legislature by which the act in question was passed, the Circuit Judges assigned to case for hearing, on the Master's report, to District Judge C. W. Sessions, of the Western District of Michigan. Judge Sessions took the position that the case ought not to be heard, and a decision ought not to be reached on proofs relating to conditions which were at that time nearly three and one-half years old, and that the Master's report, based upon such proofs, was insufficient as a basis for an adjudication of all the issues in the case, and insisted that the record should be brought down as nearly as possible to date by proofs taken in open court, and by a new hearing upon the proofs so taken. Thereupon new schedules were prepared by both parties, extensive tests were made and supplemental proofs were

taken in open court, in November and December, 1917, the additional proofs covering plaintiff's railroad operations during the four fiscal years of 1914 to 1917 inclusive. The case, therefore, as presented to the court, was upon the testimony taken before the Master and the additional proofs taken in open court.

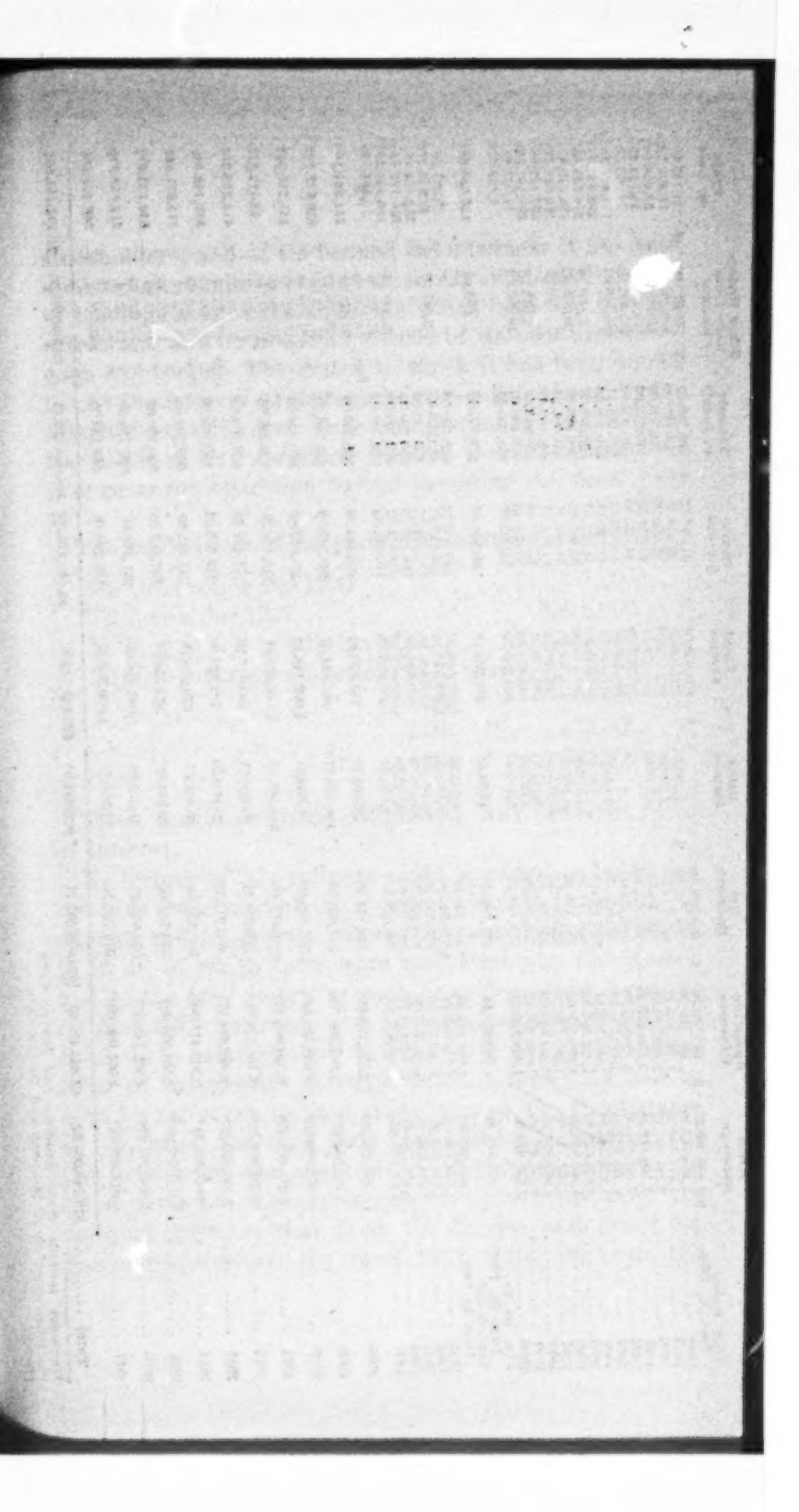
On January 8, 1918, the court handed down an opinion to the effect that the plaintiff was entitled to the decree prayed in its bill of complaint (R. pp. 73-89). Following this opinion, a final decree was entered in favor of the plaintiff on February 14, 1918 (R. pp. 90-92). This decree enjoined the defendants from enforcing, as against the plaintiff, the act complained of, and also ordered that the bond filed by the plaintiff to secure the coupons issued under the restraining order be discharged and that the money deposited in the banks for the redemption of the coupons be paid over to the plaintiff. Upon the taking of the appeal, this portion of the decree was stayed, and the plaintiff was compelled to continue issuing coupons pending the appeal. The plaintiff continued to issue these coupons until January 1, 1918, on which date the United States Government took over the operation of plaintiff's road. The Director General of Railroads continued to issue these coupons until June 1, 1918, when the new passenger rates ordered by him were put into effect. Since that time no coupons have been issued.

Location and History of Plaintiff's Railroad.

The history of plaintiff's railroad is similar to that of almost any trunk railroad in the United States, in that it is a consolidation of many smaller lines built at different times. The first line was built in 1855 and ran from Marquette 20 miles west, to reach the iron mines then being opened up near Ishpeming. Later this portion of the road was extended in sections constructed at different times to Houghton, to connect the "iron country" of Michigan

with the so-called "copper country," practically all of this construction being under federal and state land grants. In 1871 the State of Michigan, out of a desire to establish railroad connections between the two peninsulas, offered a swamp land grant for the construction of a railroad from St. Ignace, on the Straits of Mackinac, to the city of Marquette, which railroad was constructed under many difficulties and was finally completed in 1881. None of these roads was profitable, and it became apparent that the only hope for making them profitable was to consolidate them as parts of a through system. So in 1887 the plaintiff corporation was organized for the purpose of consolidating these different roads and building a through line from Sault St. Marie, where a through eastern connection was to be had with the Canadian Pacific R. R., west to Duluth, Minnesota, where connection was to be had with the railroads from the west. Following its organization, a line was built by the plaintiff east from Soo Junction to Sault St. Marie and west from Nestoria to Duluth, thus creating the through system as planned. On this consolidation none of the lands so granted by either the federal or the state government came into the possession of the plaintiff except a small portion of one of the state grants.

The expectations of the promoters, so far as the profitable operation of the railroad was concerned, were never realized, although this railroad has given to the upper peninsula of Michigan, and, for that matter, to the lower peninsula, the benefit of a fairly well operated railroad, geographically and in every economic view of the greatest public value. So far, the public alone has been benefited by its operations, and it would seem that this benefit would continue for all times, as it has been demonstrated that it can earn its operating expenses. Those who own the property, however, have failed to realize any benefit from it. It has never paid one cent of dividends to its



DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY

STATEMENT OF OPERATIONS

Year ended	Gross Earnings	Operating Expenses	Net Earnings	Other Income	Total Income	Taxes Accrued	Interest on Bonds	Other Deductions from Income	Profit or Loss
Dec. 31, 1897 ...	$ 1,465,689.22	$ 981,730.89	$ 693,958.34		$ 693,958.34	$ 31,001.57	$ 265,788.07	$ 175,919.68	$ 121,189.02
1898	1,469,522.16	865,796.06	594,794.10	$ 8,306.33	503,100.43	26,158.48	440,072.00	196,707.31	79,837.36‡
1899	1,976,350.26	1,146,876.13	829,474.26	2,836.00	832,312.26	36,956.25	519,352.00	329,670.57	53,666.56‡
1900	2,241,097.12	1,422,703.81	818,393.31	1,158.00	819,551.31	43,844.95	519,012.00	313,417.86	56,723.50‡
1901	2,160,118.24	1,332,292.34	827,825.90		827,825.90	44,835.90	516,932.00	253,092.62	12,375.36
1902	2,249,194.25	1,484,695.20	764,499.05		764,499.05	44,569.61	671,704.24	165,716.63	117,491.33‡
1903	2,078,777.54	1,474,754.88	604,022.66	10,135.51	614,158.17	42,846.18	870,166.66		298,854.67‡
1904	1,670,787.00	1,094,238.81	576,748.19	3,787.48	580,535.67	44,024.97	866,000.00	2,950.10	334,439.40‡
1905	1,811,822.05	1,121,503.23	690,319.70	55,076.00	745,395.70	35,601.65	866,265.00	26,725.86	183,226.81‡
1906	1,905,810.53	1,234,679.67	671,130.86	32,402.20	703,533.06	38,462.47	901,096.24	856.47	196,884.22‡
1907	1,591,114.88	1,064,723.70	526,391.18	20,807.56	546,998.74	41,031.71	860,166.33		352,155.08‡
1898	1,821,807.59	1,224,045.79	597,761.80	5,417.91	603,179.71	41,754.84	859,616.67	7,953.78	298,191.80‡
1899	2,407,437.39	1,468,696.17	938,541.22	4,937.31	943,478.53	53,653.45	859,700.00	16,067.08	14,057.44
1900	2,557,973.46	1,628,839.21	929,134.25	5,446.45	934,580.70	78,900.27	859,700.00		4,169.57‡
Jan. 1st to June 30, 1901...	1,169,524.26	799,821.51	377,702.75	4,050.43	381,753.18	80,244.42	429,850.00	393.45	128,834.68‡
Year ended June 30, 1902....	2,600,569.36	1,668,818.38	1,001,750.98	6,286.22	1,008,036.20	128,068.92	859,700.00		20,337.28
1903	2,772,134.67	1,758,089.74	1,014,044.93	14,665.20	1,028,710.13	200,213.67	859,700.00	2,647.00	33,850.54‡
1904	2,524,612.07	1,749,456.12	775,155.95	11,483.96	786,639.91	210,391.07	859,700.00		283,451.16‡
1905	2,706,936.02	1,882,705.09	824,230.93	15,650.35	839,881.28	216,733.73	859,700.00		206,552.45‡
1906	3,057,775.40	2,057,459.76	1,000,315.64	9,112.88	1,009,428.52	292,471.22	859,700.00	13,593.40	156,336.10‡
1907	3,311,878.06	2,320,857.89	991,020.17	8,930.48	999,950.65	170,282.84	859,700.00	25,503.76	55,535.95‡
1908	2,986,058.38*	2,252,788.68†	734,171.70	30,405.22	764,576.92	186,345.24	859,700.00	Dep. 35,539.30	351,661.18‡
1909	2,785,586.83*	2,037,900.83†	747,686.00	146,208.67	893,894.67	203,500.70	859,700.00	" 39,053.56	230,627.77‡
1910	3,372,089.65*	2,330,509.63†	1,041,480.02	50,656.14	1,092,148.16	225,917.63	859,700.00	" 28,204.21	551,714.96‡
1911	3,219,861.55*	2,330,955.87†	888,905.68	249,569.69	1,138,475.37	215,179.79	859,700.00	" 32,418.53	68,119.01‡
1912	3,224,906.56*	2,464,234.01†	760,672.57	39,238.61	799,911.18	217,417.80	859,700.00	" 184,628.63	412,235.00‡
1913	3,495,672.33*	2,802,658.57†	693,013.76	34,806.30	727,820.06	219,625.03	859,700.00	" 173,616.56	596,196.54‡
1914	3,495,644.54*	2,842,411.00†	653,233.54	26,462.25	679,695.79	247,442.99	859,700.00	" 19,340.81	713,741.34‡
1915	2,938,597.06*	2,401,834.66†	536,762.38	42,134.59	578,896.97	197,313.26	859,700.00	" 112,073.78	495,815.67‡
1916	3,506,792.22*	2,482,148.51†	1,024,643.71	61,272.96	1,085,916.67	251,780.46	859,700.00	" 41,675.42	276,433.29‡
1917	4,074,692.84*	3,055,980.60†	1,018,712.24	71,588.23	1,090,300.47	191,290.16	859,700.00	" 93,352.98	366,383.65‡
								Dep. 46,072.54	
								196,620.53	
								Dep. 57,879.40	
								228,634.74	
								" 67,482.56	
								105,210.80	
								" 39,608.86	
								148,270.64	
								" 68,354.54	
								237,338.82	
Total	$78,740,004.62	54,963,496.85	$24,076,507.77	972,635.93	$25,049,143.70	$4,068,170.29	$24,022,115.41	$3,490,400.66	$6,532,151.66‡

*Includes revenue from Sleeping and Dining Cars.
†Includes expenses of Sleeping and Dining Cars.
‡Deficit.

stockholders, and of its bonded indebtedness it has been able to pay regularly only the interest on a small amount of bonds of one of the railroads which made up the consolidation, and on about $3,816,000 of its own first mortgage 5% bonds. The extent to which it has been unable to pay the interest on its remaining bonds is shown by the attached exhibit taken from the testimony, which gives the result of its operations year by year, from the time it commenced operation to and including the fiscal year 1917.

The funded debt of the plaintiff's railroad is as follows:

4% Gold bonds due 1990					$15,107,000.
5% bonds due 1937					3,816,000.
M. H. & O. 6% bonds due 1925					1,077,000.
Equipment trust obligations			11th	Series	5,800.
"	"	"	12th	"	31,000.
"	"	"	13th	"	132,000.
"	"	"	14th	"	392,000.

These equipment trust obligations bear different rates of interest.

No history of this railroad could be complete which did not give some idea of the country which it traverses, its climate and its population and the population tributary to it, all of which facts were well known to the Master and to the trial judge, as both have frequently traveled on plaintiff's railroad, and have had an opportunity to inspect the same and are familiar with the general character of the country through which it runs. As will be seen by reference to the outline map on the frontispiece of this brief, the road runs east and west, skirting, for the most part, the south shore of Lake Superior. In some parts the country is rugged. The location of the railroad requires that from St. Ignace and Sault St. Marie respectively, the road must climb up from the

level of Lake Michigan and Lake Superior respectively and to reach Marquette, must descend again to the level of Lake Superior. From Marquette it must pass over a divide and again reach the level of Lake Superior at L'Anse, whence it must again climb up, only to descend to the level of Portage Lake at Houghton. Yet, of the railroads just mentioned, with the exception of the line from Sault St. Marie to Soo Junction, the route of the road was dictated either by the State of Michigan or by the United States.

The winters in the upper peninsula are considerably longer, the cold is more severe, and the snowfall is much greater than in the lower peninsula; and the operation of a railroad is therefore more expensive. The operation of plaintiff's railroad is particularly expensive, as, skirting as it does the south shore of Lake Superior, it receives through its whole length the force of all storms from the north. That the operation of a railroad in such territory is more attendant with difficulties than in other sections of the United States has long been recognized by Courts and commissions:

Wellman *vs.* Chicago Grand Trunk Ry. Co. 83 Mich. 592.

Michigan Copper & Brass Co. *vs.* D. S. S. & A. Ry. Co. *et al*, 25 I. C. C. 357 at p. 363.

In the Wellman case above cited the court said (p. 600):

> "We are authorized to take judicial knowledge, for it is a matter of general knowledge, that the cost of building and running railroads in the Upper Peninsula is much greater than in the Lower, owing to the marked physical difference between them in the character and face of the country. This distinction has been carried in the railroad law of this state

for over 17 years; and distinctions in the legislation, upon many matters, between the two peninsulas have been constant and frequent ever since the Upper Peninsula has been a part of Michigan."

An examination of the map will show that there are no large centers of population on this railroad in Michigan from which to draw traffic. According to the census of 1910, Sault St. Marie had then a population of 12,615, and St. Ignace of 2,118, and between those places and Marquette, which then had 11,503 population, there is in 151 miles of railroad, only one considerable village, Newberry, with a population of 1,182 inhabitants. Ishpeming, twelve miles from Marquette, had 12,448 population; and Negaunee 8,460; and outside of these places there was but one village, Baraga, that had 1,000 population until Houghton is reached, with its population of 5,113. From Nestoria west to the State line there was no city or village of 1,000 population unless it was the village of Ewen, the population of which is not separately given in the census report.

It appears from the evidence in the case (plaintiff's exhibit 53-R. p. 1179) that in 1910 the population per mile of main line railroad owned in the entire state of Michigan was 491; in the upper peninsula it was 218; in the lower peninsula 587. The population per mile of all tracks owned for the entire state was 271; in the upper peninsula 109; in the lower peninsula 336. According to the census reports the population of the upper peninsula of Michigan in 1910 was only 19.5 inhabitants per square mile; while in the lower peninsula it was 60.9 inhabitants per square mile.

The following comparative table, compiled from the annual reports of the Michigan Railroad Commission (R. p. 1042) shows very graphically the reasons why the plaintiff cannot profitably carry passengers at the same

rate of fare prescribed for railroads in the lower peninsula. The comparative statistics are those of the Michigan Central and Grand Rapids & Indiana railroads, two representative carriers of the lower peninsula, the Michigan Central being a so-called "prosperous" road and the Grand Rapids & Indiana being a so-called "struggling" road.

MICHIGAN PASSENGERS CARRIED ONE MILE PER MILE OF ROAD.

R.R.	1911	1912	1913	1914	1915
Mich. Cen.	197,732	203,968	214,246	226,881	222,795
G. R. & I.	159,075	161,987	169,722	175,639	164,541
D. S. S. & A. (plaintiff)	74,721	72,238	77,337	88,524	67,493

PASSENGER TRAIN REVENUE PER MILE OF ROAD.

(The Mich. Cen. and G. R. & I. charging at the rate of 2¢ per passenger mile and the D. S. S. & A. at the rate of 3¢ per passenger mile).

Mich. Cen.	4,751	4,842	5,344	5,662	5,628
Mich Gen.	4,751	4,842	5,344	5,662	5,628
G. R. & I.	3,370	3,461	3,716	3,896	3,729
D. S. S. & A. (plaintiff)	2,199	2,068	2,194	2,458	2,027

GENERAL PRINCIPLES OF LAW.

It is well settled by decisions too numerous for citation, that a State, under its police power, may regulate the rates to be charged by common carriers for services rendered by them within the state. But this power is not an arbitrary one, nor is it without limitation.

Over the state and its legislature, stands the Constitution of the United States, as "The Supreme Law of the land." (Article I. Sec. 2).

Article I, Sec. 10 of the Constitution, provides:

> "No state shall pass any * * * * law impairing the obligation of contracts."

Consequently, if a railroad company has a valid contract authorizing it to charge a certain rate, any state law attempting to impose upon the company a lower rate, is in excess of the power of the state, and void.

Article I, Sec. 8 of the constitution provides:

> "Congress shall have power to regulate commerce with foreign nations, and among the several states, and with Indian tribes."

Consequently, when under this power, congress has legislated with respect to interstate commerce, and an act of a state regulating railroads directly interferes with the application or enforcement of the federal law, the act of the state is beyond its power, and is void.

The Fourteenth Amendment to the Constitution of the United States, in Section I provides:

> "Nor shall any state deprive any person of life, liberty or property without due process of law."

Consequently, whenever an act of a state, in the regulation of railroads, operates to take from the carrier, any of its property without compensation, the act is beyond its power and is void.

Railroad companies are persons within the meaning and protection of this constitutional provision.

> *Santa Clara Co.* v. *Southern Pacific R.R. Co.*, 118 U.S. 394 (p. 396).

Property as protected by this constitutional provision,

consists not only in the title to physical property itself, but also in the right to a reasonable return upon the fair value of property devoted to a public use. Consequently if an act of the state in regulating railroads, attempts to impose upon a carrier, a rate which will yield a return upon the property used and useful in its public service, below what is reasonable, then the act of the state is beyond its power, and is void.

Minnesota Rate Cases, 230 *U.S.* 352 (*p.* 434).

Inasmuch as the power of a state is limited to the regulation of rates and charges for business done within the state, it follows that this state rate, to be valid, must produce from purely state business, a fair return upon the reasonable value of the property of the carrier, used and useful in its state business.

Minnesota Rate Cases, 230 *U. S.* 352 (*p.* 435).

While it is true that each item of traffic transported need not necessarily yield the same percentage of profit, yet the state has no power to compel the carrier to transport passengers at less than a reasonable rate, even though the aggregate return of the carrier from all its traffic within the state, both freight and passenger, is adequate. In the investigation of the validity of a state law fixing passengers rates, inquiry is limited to the question whether the proposed rate will yield a passenger revenue which will constitute a reasonable return upon the property of the carrier used and useful in its passenger business within the state; and in this inquiry, the amount of return received by the carrier from the transportation of freight, is immaterial.

Norfolk & Western Ry. v. *West. Va.*, 236 *U. S.* 605.

The Issues of Fact.

To maintain its allegations that the rate complained of would be confiscatory, it became incumbent upon the plaintiff to prove that under such rate the return from its intrastate passenger business would not be sufficient to enable it to pay its operating expenses, maintain its property and pay a fair return upon the value of the property used in such intrastate passenger business.

It therefore became necessary to establish two principal facts: first, the fair value of the property employed by plaintiff in its intrastate passenger business; second, the net return which plaintiff may expect to realize from its intrastate passenger operations under the prescribed rate.

To establish the first fact, it became necessary to value the entire property of the plaintiff in Michigan; then to ascertain the value of the property used in the entire passenger service; and then to ascertain the value of the property used in the intrastate passenger service.

To establish the second fact, it was necessary to ascertain what the total revenues and expenses of the plaintiff have been in the past; what portions of such revenues and expenses came from business in the State of Michigan; what portions of such revenues and expenses came from the passenger business; what portions of such revenues and expenses came from the intrastate passenger business; then to make the proper computations to obtain the net results of the operations of the past, as a guide in considering the future; and also to find what the loss in intrastate passenger revenues would be if the reduction in rate ordered by the act complained of were put into effect.

Valuation.

The trial judge in deciding this case, did not find it

necessary to investigate and determine the real value of plaintiff's property in Michigan devoted to the public use. It was apparent to him that the return which the statute would yield to the plaintiff company would be so small that even accepting the valuation of the property as claimed by the defendants the return would be inadequate and confiscatory and upon this basis he decided the case.

We believe that this court will reach the conclusion announced by the trial court and will therefore find it unnecessary to go into the questions as to the real, actual value of the plaintiff's property. In this brief therefore, we shall present our case upon that theory, taking as the basis for our computations the values of the different property schedules as claimed by defendants and as allocated by them to (1) Exclusive passenger property. (2) Exclusive freight property, and (3) Property used in common by the passenger and freight services.

However, should this court reach a different conclusion than that reached by the trial judge it will be necessary to determine the real actual value of plaintiff's railroad property. To aid the court in such investigation and determination, if it is necessary to be made, we are filing herewith a separate brief on the questions of property value.

Division of Property Values Between Passenger and Freight.

Both parties in presenting to the court an inventory and appraisal of plaintiff's railroad property in Michigan allocated each item of property to the service in which such item of property was used, whether passenger or freight. Such items of property as were used in both services were assigned to common passenger and freight. Some minor differences arose as to certain allocations, which differences were adjusted during the hearing, with

the result that there is now practically no dispute between the parties as to these allocations. Slightly more than one-third in value of total property of the plaintiff was thus allocated to one service or another. The values and allocations of the defendants, upon which, for the purpose of this brief, we base our computations, are as follows:

	Total	Passenger	Freight	Common pas. & freight
1913	$11,068,193	$494,104	$3,683,711	$6,890,378
1914	11,674,752	540,031	3,909,531	7,225,190
1915	11,697,474	531,607	3,899,190	7,266,677
1916	11,526,134	523,565	3,706,621	7,295,948
1917	11,875,868	502,095	3,845,207	7,528,566

[Note.—The above allocations are not exact, as it is difficult to determine from defendants' exhibit 332 (not printed), from which exhibit these figures are taken, just how the net additions to the property during the years subsequent to 1913 were allocated by defendants, but we believe them to be substantially the allocations as claimed by defendants.]

For that portion of the property used in common by both services some method of apportionment had to be devised. Although many methods have been used in the past by lower courts and by commissions for making the division of this property, the only announcement by this court with reference thereto is its statement in the Minnesota Rate Cases that

> "When rates are in controversy, it would seem to be necessary to find a basis for a division of the total value of the property, independently of revenue, and this must be found in the use that is made of the property, that is, there should be assigned to each business that proportion of the total value of the property which corresponds to the extent of its employment in that business. It is said that this is extremely difficult; in particular, because of its necessity for making a division between passenger and

freight business and the obvious lack of correspondence between ton miles and passenger miles. It does not appear, however, that these are the only units available for such a division; and it would seem that after assigning to passenger and freight departments respectively, the property exclusively used in each, comparable use units might be found which would afford the basis for a reasonable division with respect to property used in common."

As to certain schedules, "comparable use units" readily suggested themselves and were agreed upon. For example, the value of each locomotive was apportioned between passenger and freight on the basis of the miles run during the years 1913 and 1917 respectively in the passenger and in the freight service. Values of switch engines were apportioned on the proportions of passenger and freight yard switching during the year. In like manner the value of the fuel stations was apportioned between the two services on the basis of the amount of coal consumed in each service, and the value of the shops and engine houses was apportioned on the basis of locomotive housings.

There remained, however, a great part of the common property yet to be divided, consisting principally of the main line right of way, roadbed, and the track structures thereon. The parties differed as to the basis for this division, just as they differed as to the proper methods of dividing common expenses of operation. On one thing they were agreed; that any unit of use which will fairly divide the common expenses of operation not due to wear and tear (commonly called the "weather" expenses as distinguished from "wear" expenses) is properly applicable to the division of common property, or, reversing the proposition, if we find the unit of use which will properly divide property, we have in that unit a perfect measure for the division of all items of expense attributable

to depreciation caused by the elements, for the reason that this expense represents only the expenditures necessarily made to take care of that depreciation in the common property. The division of those expenses due to the wear and tear on the property is an entirely different proposition. A proper unit of use for the division of common property may or may not be properly applicable to the division of common "wear" expenses of operation, depending, of course, upon which service causes the major portion of those "wear" expenses.

It was the contention of the plaintiff that the proper "comparable use unit" for the division of common property was found in the Revenue Train Mile, i. e., that the common property should be divided in the proportion of the respective miles run during any typical period of time by the revenue trains, passenger and freight. This ratio, modified as hereinafter explained, assigns for the year 1917, 42.21% of the common property to the passenger service.

As to this "comparable use unit" the defendants' accountants did not agree with the plaintiff's, nor even with one another.

Mr. Thompson, who was defendants' principal accountant on the hearing before the Master, and Mr. Parker, who succeeded Mr. Thompson and who applied in his computation Mr. Thompson's theories, used for their division of common property a ratio which they called the "time" ratio. The general basis of this ratio was the elapsed time of all passenger trains on the road between terminals added up for the whole year as compared with the elapsed time of all freight trains on the road between terminals during the year. An example of this ratio, showing how it is made up, appears in volume V of the record on page 527. This ratio for the year 1917 assigned 23.19 per cent of the common property to the passenger service.

On the other hand, Mr. Hillman, another expert ac-

countant employed by the defendants, used for the division of common property a ratio called the "gross ton mile" ratio. This ratio was arrived at by multiplying the loaded weight of the trains in each service respectively, including their locomotives, by the miles made by those trains; and is illustrated on page 218 of the Hillman exhibit, Vol. VI of the record. This ratio, for 1917, assigned 25.68 per cent of the common property to the passenger service.

Our reason for considering the revenue train mile as the proper unit of use to be used in dividing common property is that every activity in and about a railroad is directed to, or has for its ultimate purpose the carrying in trains of passengers and freight offered for transportation. If there be any other use of the common property than by revenue trains, such use is not only subordinate to but is in furtherance of the use by revenue trains. Each use of the common property by a train is an exclusive use. This is obviously true of any single track railroad.

That the time ratio is not the proper unit of use is, we think, easily apparent. To show the result arrived at by carrying such a theory through to its logical conclusion, it was necessary to propound only one question to the proponent of that theory, Mr. Parker, on his cross examination. This question and the answer thereto appear in the record in narrative form as follows: "Assuming a passenger and a freight train both starting from St. Ignace at the same time, and the passenger train went enough faster than the freight so that it reached Marquette, turned around and went back to St. Ignace, completing the double trip over the road in the same time that the freight train arrived in Marquette on its single trip, according to the time theory the use of the common property by those trains would be the same" (R. p. 1089).

Time may measure rental in a building, because however little the occupants use the property, they have the

exclusive use of it all the time. But in the case of a property such as a single track railroad, which is used in common by two services in order to accomplish for each the ultimate results desired, namely, the movement of passengers or freight over a certain distance, the length of time each uses a certain portion of the property is not an indication of the use, rather it is the reverse of an expression of the use which that service makes of the property.

What the defendants denominate "time of occupancy" is occupancy, not of certain property during a certain time, but of a certain time in accomplishing a certain journey or movement. If a freight train or a passenger train should stand on the common property for days or weeks, it would constitute an actual occupancy, but the time of such occupancy would not here be taken into account at all. It is only train movement that is taken into account, and movement can be measured only by a unit of distance. What the defendants here in reality undertake to measure is not the extent of time of occupancy, but the extent of time consumed in making a movement; an extent which bears no relation to the extent of the movement. To graduate the charge for the privilege of moving a train 100 miles on the common property in proportion to the time consumed in making the movement instead of on that of the distance moved would be irrational. It would be the same in principle as though a toll road company should charge a horse and carriage for a journey of ten miles the same amount that it charged an automobile for a journey of fifty miles, for the wholly irrelevant reason that each journey consumes the same amount of time. In the one case, as in the other, the use, the extent of which is to be measured, is a movement use. The extent of a movement use is an extent in space or distance; and the unit by which such a use is to be measured is therefore of necessity a unit of distance.

It will also be noted that the time basis is found to be

in conflict with the statute itself, which we are here considering, while the distance basis is in harmony with that statute. That is, the statute fixes the rate of fare to be charged, not by the amount of time during which the passenger is on the train, but for the distance for which he is carried, namely, 2¢ per passenger mile. Also, in determining whether or not a railroad comes within the statute it fixes a similar measure, viz., the statute is applicable to those carriers on which the gross passenger train earnings equal or exceed $1,200 not for every hour or other unit of time consumed by the passenger train—but for every mile of road on which passenger trains are regularly operated, without any regard for the time consumed in the movement of such trains.

The vital defect in the theory, on which the gross ton mile ratio, as a unit of use, is based, is that it undertakes to treat a ton of passengers the same as a ton of freight, when there is no such relation, either in the manner in which they are carried or the purpose to be accomplished in getting the passengers and the freight over the road. On the freight side the thing we are trying to accomplish is to move tons, except that we run certain local freight trains which have to be run on schedule regardless of the tonnage. The chief purpose is to move tons, and we move those tons in trains. When we pass to the passenger side, the chief purpose is not to move so many passengers; it is to move over that road on schedule time so many trains upon which passengers may wish to travel at their convenience at certain times of the day or night. If it were a proposition of only moving so many tons of passengers, we could allow them to concentrate at the stations until a sufficient number were obtained, making up a train of twenty or thirty cars and move them all at once; but the purpose we are trying to accomplish there is to accommodate the public, which considers time a necessary element in business; and to operate trains at different times of the

day and night to suit their convenience, regardless of the number of passengers who may wish to travel on one train or another so long as there is sufficient travel to justify the running of these different trains.

ANALYSIS OF RESULTS OF DIFFERENT METHODS OF DIVISION.

In a case of this kind we are all partisans, and being partisans, all of us, counsel as well as engineers and accountants, become interested in certain theories and in making up our computations follow those theories through to an apparently logical conclusion, accepting the result without question, until it is pointed out by some skeptic that although the theories seem logical and seem to have been logically applied, the result obtained is most unusual and improbable. Therefore, it is often wise, before finally accepting the result of an application of our theories, to step back for a moment and look at that result in perspective. Let us do that in the case of the division of our common property.

Both sides have divided the property between passenger and freight, first by allocating to passenger and to freight respectively, all the property used exclusively in each of those services and then by dividing the balance of the property, being that used in common by passenger and freight, upon bases which must, under any conditions, be more or less arbitrary. To see if these bases are proper ones to apply let us see what the results are after the whole amount of passenger property has been set apart. These results are as follows, using the figures of the year 1917:

Ratio used	Total Property	Exclusive Pass.	Pass. proportion common	Total Pass.
Time	$11,875,868	$502,095	$1,745,873	$2,247,968
Gross ton mile	11,875,868	502,095	1,933,104	2,435,199
Rev. train mile	11,875,868	502,095	3,177,812	3,679,907

Considering these results from perspective, let us see how they compare with what is found to be the passenger proportion of property on railroads generally.

Studying the various cases which have passed upon this question of railroad valuation and of the division of property between passenger and freight, including those cases which have been lost by the carriers, as well as those which have been won by them, we find that the passenger property generally runs from 30% to 35% of the total. In the Western Passenger Fares Case, the Interstate Commerce Commission found that for all the Western railroads the passenger property was 31.7% of the total. Looking at the result from this basis, we find that the plaintiff's figures, far from being exaggerated, are conservative in that they assign to passenger, out of all the property, 30.99%. The defendants' result, however, achieved by applying their methods of division, shows a property assignment to passenger, where the gross ton mile ratio is used of only 20.49%, and where the time ratio is used of only 18.9%.

Again, for purpose of comparison, still studying our result from perspective, let us compare the division of property with certain other divisions between passenger and freight, for instance, Revenues. Although the revenue basis is not a proper one for making divisions of property, because revenues are variable and are often the point of controversy, it nevertheless will do no harm and may be of some value to use Revenues for a comparison of this kind. It appears that of the total revenue of the plaintiff in the year 1917, 32.42% thereof was passenger revenue; so that the proportion of property which plaintiff has assigned to passenger, is somewhat less than if it had been assigned on the revenue basis. On the other hand, defendants' assignment to passenger is less than two-thirds of the passenger proportion of the total revenues.

Again, using another basis for comparison, let us take the passenger proportion of the total operating expenses. That, of course, is not an absolute guide, as there are disputes between the parties as to the division of many of the expense items; but in view of the fact that a large part of the expenses are actually allocated, the disputed accounts aggregating only about 20% of the total, the division of operating expenses between passenger and freight will at least serve us for the purpose of rough comparison. Plaintiff's computations assign, out of the total of operating expenses, 33.34% to passenger. Therefore, on this basis the plaintiff's assignment of property values, 30.99% seems conservative. On the other hand, even though the defendants have applied to the divison of operating expenses the same extreme theories which they apply to the division of common property, the result of their computation shows that they have had to assign 28.7% to passenger. Therefore, according to defendants' own theories and computations, the proportion of property which they assign to passenger (20.49% in one case and 18.9% in the other) is not much more than two-thirds of the passenger proportion of operating expenses.

From perspective the plaintiff's divisions of property appear to have the merit of logic in that the results coincide, first, with the passenger proportion of property on other railroads; second, with the passenger proportion of revenue; third, with the passenger proportion of expenses. On the other hand, the results achieved by applying defendants' theories do not coincide at all with what we would expect; they do not coincide with the division of revenues, and they do not coincide at all with even defendants' own division of expenses.

Revenue Train Mile Ratio as Modified.

Plaintiff's first position as to the revenue train mile ratio was to use the proportions of the revenue train

miles as they appeared in plaintiff's operating statistics, without change or modification, but on further consideration, we were able to see that the straight revenue train mile ratio might not be deemed to make proper allowance for the admittedly greater use of the common property in freight switching operations. We, therefore, made up a modified train mile ratio, which we believed gave due effect to the use of the common tracks in switching. This ratio, again modified to meet objections by defendants, was adopted by the Master, and used for the division of common property and common expenses. (Master's report, R. Vol. III, pp. 230-54.)

This ratio at that time was difficult of accurate construction, as the statistics in the record did not show the switching miles made by road engines, and the proportion of the switching miles made on the common tracks could only be approximated. It is apparent that in such a ratio, to be used for the division of common property and common expenses of maintenance thereof, it would not be proper to include switching mileage made on property allocated to freight, the expenses of the maintenance of which have also been allocated.

Since the case was heard by the Master, however, the Interstate Commerce Commission changed its classification of accounts so that certain statistics are now kept which we did not have before, and we now have, for the years 1915, 1916, and 1917, the actual number of miles made by the road engines in switching. Also, in the preparation for the taking of additional testimony in this case, in April, 1917, we were able to make actual tests, for both our road and yard engines, as to the proportion of the switching done by those engines which is done on the common tracks. These tests were made with the cooperation of the defendants and there is no dispute between the parties as to the correctness of the results shown.

We have, therefore, been able to construct, on fairly exact data, a modified revenue train mile ratio which gives due credit to the use of the common property by locomotives in switching. To make up this ratio we added to the passenger revenue train miles the switching miles made by passenger locomotives on common tracks and to the freight revenue train miles the switching miles made by freight locomotives on common tracks, and the result was to give us a true expression of the use, by each service, of the common property which we are dividing.

The detailed computations, by which we obtained this ratio, for each of the years, are shown on page 1 of plaintiff's Exhibit 210 (R. Vol. VII.)

When the trial judge came to pass upon this issue, although he expressed his opinion that the modified train mile ratio employed by the plaintiff was more logical than the ratios proposed by defendants for this division, (R.p.84), he nevertheless adopted for his division of common property the method used by the Interstate Commerce Commission for apportioning common expenses and common property in the Western Passengers' Fares Case, (37 I. C. C. Rep. I), which method of division was referred to by this court in the opinion in the case of *Rowland* vs. *Boyle*, 244 *U. S.* 106. This method was devised by the Interstate Commerce Commission in accordance with the theory that "The fuel consumed by road locomotives drawing trains over the roads; the lubricants, water and other supplies for these locomotives; the train supplies; the wages of train men and engine men are all separated between passenger and freight, and each by itself or the aggregate of all will constitute an index of the utilization of the tracks by these two branches of the service." A ratio made up by proportioning the aggregate of these several accounts would assign to passenger the following proportions in the several years in question: 1912, 36.24%, 1913, 34.88%, 1914, 37.52%, 1915, 41.21%, 1916, 37.36%, 1917, 33.93%.

The following table shows the proportion of the common property assignable to passenger by the use of any one of the several ratios:

	1914	1915	1916	1917
Modified Rev. Train Mile	45.09%	48.65%	44.63%	42.21%
Time Ratio	25.60%	28.21%	24.94%	23.19%
Gross Ton Mile	30.11%	32.06%	27.71%	25.69%
I. C. C. Formula (used by trial judge)	37.52%	41.21%	37.36%	33.96%

Division of Passenger Property Between the Intrastate and the Interstate Business.

After allocating to the interstate business the value of any passenger property used exclusively in that business, the trial court apportioned the remainder of the passenger property, including the passenger proportion of the common freight and passenger property determined as above stated, between intrastate and interstate on the relation of the miles traveled by intrastate and interstate passengers. There was no dispute between the parties as to the correctness of this method.

Taking defendants' values as a basis, the final intrastate property valuation would be as follows, according to whichever ratio was used for the division of common property between passenger and freight:

	1914	1915	1916	1917
Modified Rev. Train Mile	$2,107,926	$2,477,171	$2,306,989	2,600,656
Gross Ton Mile ratio	1,407,549	1,637,990	1,579,830	1,721,006
Time ratio	1,196,950	1,441,150	1,291,574	1,588,639
I. C. C. formula (Method used by trial court)	1,993,453	2,338,289	2,176,466	2,042,114

Division of Revenues and Expenses.

To enable the Court to find what return plaintiff can reasonably expect under the rate complained of, it became necessary to study the return it has been receiving from

its operations in the past. For this purpose there was shown in evidence on the hearing before the Master a full statement of all plaintiff's operations in the State of Michigan for the four fiscal years 1910, 1911, 1912, and 1913, showing the revenues and expenses and the net income. The revenues and expenses were so allocated, apportioned and assigned, first, between passenger and freight, and second, between intrastate and interstate passenger, as to show the net return each year from the intrastate passenger business alone.

Such revenues and expenses and the divisions of the same appear in the Record as Exhibits to the Master's report (R. Vol. III, pp. 468-503).

For the hearing before the Court the plaintiff prepared similar statements of its operations in Michigan for the four fiscal years following 1913, which are plaintiff's Exhibits 206, 207, 208 and 209 (R. Vol. VII). These exhibits are of a similar nature to those introduced before the Master, but, due to a change in the method of keeping the accounts, prescribed by the Interstate Commerce Commission in 1914, plaintiff was able to show the operations for 1915, 1916 and 1917 in greater detail, and, we think, with somewhat greater accuracy.

Defendants' similar exhibits are Exhibit 325 (Vol. V of the Record) and Exhibit 329 (Vol. VI of the Record).

The Court therefore had, for consideration in judging what net return could be expected under the prescribed rate, the detailed results of eight years of plaintiff's operations.

We shall now state somewhat in detail the methods used in the preparation of such exhibits.

Revenues.

There is practically no dispute between the parties as to the revenue accounts or as to the proper method of their division.

The plaintiff's accounts are so kept that the direct revenues, from the carriage of passengers and from the carriage of freight, are allocated, as are also the intrastate and interstate passenger revenues.

There are certain small incidental revenues derived from the property used in the transportation business of the plaintiff which are not allocatable. These have been apportioned between the passenger and freight services on the basis of the direct revenues, this method being the method used by counsel for both parties.

There are certain incidental passenger revenues which cannot be allocated to either the intrastate or the interstate business, and these, together with the passenger proportion of the revenues last mentioned, have been apportioned between intrastate and interstate on the basis of the direct passenger revenues, this method being also used by both parties.

The defendants contend that the revenues from carrying mail and express on passenger trains, together with the expenses attributable to carrying mail and express should be set apart as an outside operation. They therefore do not include revenues from mail and express in their computation of passenger revenues.

This question is discussed later on in this brief.

Operating Expenses.

The operating expenses of the plaintiff are, under the accounting rules of the Interstate Commerce Commission, shown in a large number of primary and sub-primary accounts, under five different groups: (1) Expenses of Maintenance of Way and Structures. (2) Expenses of Maintenance of Equipment. (3) Traffic Expenses. (4) Transportation Expenses, and (5) General Expenses.

Division of Operating Expenses Between States.

These accounts show the operations for the entire line, but as to nearly every primary account, it was possible to allocate the expenditure to the state in which the expenditure was made.

Certain expenditures could not be allocated as between the states, and it was necessary to make an apportionment, to ascertain the amount chargeable to Michigan. Fair methods of apportionment were found, which were used by both parties.

Michigan Operating Expenses.

There was no disagreement worthy of discussion between the parties as to the total operating expenses in Michigan.

Division of Michigan Operating Expenses Between Passenger and Freight.

The Michigan operating expenses of the plaintiff have been in a large measure allocated either to passenger or to freight. For many expenses which it was not possible to allocate, reasonable bases for apportionment have been found which are used by both parties.

We think we are justified in saying that, except for a few small accounts which it is not necessary to discuss, as a decision one way or the other would not affect the issue here, and the three accounts in the group of "transportation expenses" which we shall discuss later, the only important dispute between the parties is as to the division of that group of expenses entitled "Expenses of Maintenance of Way and Structures." The parties agree that the group of "General Expenses" should be divided on the basis of the totals of all other groups, and differ as to results only because of their disagreement on the other groups, the main difference being as stated.

Division of Expenses of Maintenance of Way and Structures.

Of the expenses of Maintenance of Way and Structures, the greater part is attributable to the maintenance of property used in common in the freight and passenger business, a certain part to the maintenance of exclusive freight property, and a comparatively small part to the maintenance of exclusive passenger property.

During the four years whose operations were considered by the Master, the records and accounts of the plaintiff were not so kept that from them the maintenance expenses attributable to these exclusively used properties could be allocated. Methods of apportionment were devised, however, based somewhat upon opinion evidence, by which a certain portion of the total maintenance expenses was assigned to the exclusive freight property and another portion to the exclusive passenger property, and, although the parties did not thoroughly agree in their methods, the results at which they arrived were not far apart.

The general basis used by both parties for apportioning these expenses, was to assume that the cost of maintaining side-tracks was one-third of the expense of maintaining main line tracks, such assumption being necessarily based upon opinion testimony. On this assumption, however, it was not difficult to separate the cost of maintenance of the tracks used exclusively in either service from the total cost of maintaining all tracks.

In the fall of the year 1915 the Interstate Commerce Commission issued an order requiring the carriers to keep their accounts so as to allocate the expenses of maintaining freight property, passenger property and property used in common by both services. This order was received so late that plaintiff was not able to comply with it in the fiscal year 1916 except for the last six months of that year, beginning January 1st, but has complied with it ever

since, and for the whole of the fiscal year 1917 these expenses were so allocated.

The allocations for the six months in 1916 could not be used as a basis for determining the relative proportions of maintenance costs in the other years, or even for the year 1916, as the maintenance costs vary materially in different seasons of the year, considerably less work being done in the winter months.

In preparing our exhibits for 1914, 1915 and 1916, instead of using the method theretofore used by us for assigning the expense of maintenance of the exclusive tracks, we applied to the expenses of those years the information which we had obtained from this actual allocation for 1917 in the following manner: We took for each primary account under the group of expenses of Maintenance of Way and Structures, the proportion of the total expenses in that account which in 1917 was allocated to the exclusive freight service, and applied that proportion to the corresponding account in each of the three preceding years, 1914, 1915 and 1916, thus giving us for each of such years the proper proportion of the expenses to be charged to the Maintenance of Exclusive Freight Tracks. The detail is shown on pages 6 and 7 of Plaintiff's Exhibit 209 (R. Vol. VII).

This method does away altogether with the doubt cast on our former estimates because of their being based on opinion testimony, and solves the problem of apportionment by the actual facts of a complete year's test. Inasmuch as this Court has ruled, in the case of *Rowland* vs. *Boyle* (the Arkansas Rate Case), 37 S. C. Rep., 577, that even a test during two typical months of operations is sufficient in a rate case, we believe that the method we have adopted is the correct one and the only correct method for making an apportionment of these unallocated expenses.

The result of the application of these tests was to show

that, of the total maintenance of way expenses on plaintiff's railroad in 1914, 8.42% thereof was properly attributable to the maintenance of the exclusive freight tracks, in 1915, 7.83%; in 1916, 8.63%; in 1917, 8.92%.

Although the records and accounts of the plaintiff, showing these tests in detail, were at all times available to the defendants, their accountants having spent many months in the general offices of the plaintiff, going over plaintiff's accounts and records in the preparation of the defendants' side of this case, they declined to make use of the figures shown by these tests in the preparation of their exhibits showing their divisions of operating expenses for the four years in question. Instead they applied the same theory which they had used in the preceding years, being the arbitrary method of assuming that the expense of maintenance of one mile of main line track is equivalent to the expense of maintenance of so many miles of side track, except that for their computations in these later years the defendants changed their proportion from 3 to 1, to 2 to 1, thereby assuming that the expense of maintenance of a mile of side track was one-half the expense of maintenance of a mile of main line. On this theory, defendants' accountants worked out what they called an "equated track mile ratio," which assigned out of the total expenses of maintenance of way in 1914, 16.89% to the maintenance of exclusive freight tracks; in 1915 17.27%, in 1916 17.18%, in 1917 17.28%. An example of defendants' method of computing this ratio is shown in the Parker Exhibit, Vol. V of the record, page 8.

When defendants' accountants were asked upon the stand to give their reasons for not accepting the result of these tests as reflected in plaintiff's accounts, they stated that one of them, Mr. Hillman, had investigated the records of the plaintiff and had come to the conclusion that the tests were unreliable and that the figures could not be used as a fair basis for dividing these operating

expenses. In view of this contention, it appears to us necessary to go somewhat into detail to show the methods by which these tests were made, and the manner in which the record of them was kept, the methods and record being described by plaintiff's comptroller, Mr. Delf, in his testimony as follows:

> "Instructions were issued to the various departments to make definite assignments to freight and passenger when making up their monthly expenses. In the case of road maintenance blue print books were made for each section showing the tracks on that section as freight, passenger and common; the common tracks being shown in white, freight tracks yellow and passenger tracks red. The section foremen were instructed each day to keep track of the labor and material used on each class of tracks and report it at the end of the month in their time books; turn the time books in to the departments to compile the final distribution, and in those departments the assignment is made to the various services, freight, passenger or common." (R., p. 1032).
>
> "Defendants' Exhibits 335-336 are blank books furnished the section foremen in which to keep a record of the work done and materials used on tracks of various classes. Exhibit 335 was for their labor and to make a distribution of it to the different classes of work; exhibit 336 was to keep track of the material and make a similar distribution. They are required to enter each man's time and make the distribution of it to services daily. The time was also distributed as to the character of work performed, whether putting in rails, ties or bridges, laying new tracks or putting in other tracks; it is entered under the various primary accounts. In addition it designates whether it is on exclusive freight or exclusive passenger tracks. I have examined many of these reports and found them uniformly correct as far as could be ascertained. Exhibit 336 is a monthly

record showing the material on hand at the first of the month, the amount received and applied during the month to the different classes of services and under the various primary accounts. I do not run across the instance referred to by Mr. Hillman in Section 34, but I found cases where the foreman had entered in the first column, provided for freight, passenger and common, the amount on exclusive freight tracks and possibly in Section 34 he had entered the balance in the next column, which are passenger tracks, when it should have been entered in the third column, common tracks. When those accounts came in for distribution, an experienced man checks the labor with the material, and he can determine whether an error of that kind is made and correct the error. It is evident those corrections were made, as the total amount carried forward to final distribution for all sections for exclusive passenger 'other track material' of the line is only $450., and the error stated by Hillman was $1,528.54 and accrued in 'other track material.' Including roadway maintenance, ties, other track material and track laying and surfacing, the exclusive passenger allocations were but $793. for the year. I have had careful oversight during the year 1917 of the way these reports were received and distribution made. I belive that except for the two errors of under $1,000. to which I called attention in my direct examination, the reports as corrected carefully show the expenses on exclusive tracks in 1917. The errors spoken of are where the blue prints show two tracks as common which should have been shown as exclusive freight." (R., pp. 1052-3).

This method of ascertaining these accounts was, of course, fallible to the extent that it involved the human element, and any one of the section foremen was liable at one time or another to make a mistake; but taking all the

section foremen as a whole, and spreading their reports over a period of a whole year, as was done, we believe that the result which was obtained reflected in a fairly true manner the actual work which was done on the plaintiff's railroad during that year, and a proper allocation of the expense to the different services. We do not believe, therefore, that the defendants were justified in ignoring these records and in proceeding to divide these accounts in a purely arbitrary manner. As this court said in the case of *Rowland* vs. *Boyle,* above referred to, "It is enough to say that the railroad adopted the only practicable mode of presenting its results; that it exhibited its work sheets and data to appellants; that the returns were made by the employees in the course of their business; and that if the appellants had desired to question any of the data, they could have called for further verification."

The extraordinary results obtained from the arbitrary method of assignment adopted by the defendants' accountants are very graphically shown by a comparison of the figures, in the primary accounts to which they applied their arbitrary percentages, with plaintiff's figures for the same accounts, plaintiff's figures being the actual allocation as shown on its books. For instance, using the figures of the year 1917, the aggregate result of division of all the accounts to which defendants' accountants applied their arbitrary percentage, shows an assignment by defendants to exclusive freight of $73,538, as compared with actual allocations on plaintiff's books for those same accounts of $39,686. Again, the amount charged by defendants' accountants against exclusive freight for maintenance account No. 214, "Rails" was $5,888, (R. Vol. V, p. 549), while plaintiff's books show that the actual expense for rails on its exclusive freight tracks in that year was only $318 (R. Vol. VII, ex. 209, p. 6). Certainly the section foremen, even if they were given to

making mistakes on other items of expense, would at least know and report correctly whether they were putting in rails on freight tracks or on passenger tracks or on common tracks.

DIVISION OF COMMON EXPENSES OF MAINTENANCE OF WAY.

The division of these expenses between passenger and freight services is not free from difficulty.

The plaintiff claimed that at least sixty percent of these maintenance expenses are attributable to depreciation of the property from weather and other natural causes, and not more than forty percent are attributable to wear caused by the traffic. The Trial Court found (R. p. 84) that the larger part of these expenses were due to causes independent of use.

As heretofore stated, it is not disputed that the expenses attributable to weather can be properly apportioned on any basis which is fair for the apportionment of the common property between the two services.

It is our claim that this basis is the modified revenue train mile ratio.

As to the expenses which are due to wear, the defendants claimed that by far the largest part is caused by the freight trains, chiefly because of their greater length and weight, and they maintained that these expenses should be divided by the use of what they called the gross ton mile ratio, being the ratio heretofore referred to as having been used by one of the defendants' accountants, Mr. Hillman, for the division of common property.

The plaintiff contended that the wear expense should be divided by the same method used for the division of weather expense, viz: the modified revenue train mile ratio. It was, of course, admitted that the freight trains were longer and heavier, but it was contended that the destructive effect caused by the weight of the freight

trains was not so great per train unit as that caused by the high speed of the passenger trains.

It was demonstrated during the argument that the difference between the two methods contended for as the division of wear expenses was not great, when reduced to dollars and cents, the difference in 1917 being $31,035.

The same facts were brought out in the testimony in this case which were found by the Interstate Commerce Commission in their Western Passenger Fares Case (37 I. C. C. Rep. at p. 12) where the Commission said:

> "The weight and speed of the passenger trains have also necessitated, in the interest of safety, a higher degree of excellence as indicated in the strengthening of the track structures and a certain higher degree of upkeep of the track and structures."

It was shown in the case at bar that this extra cost of maintenance attributable to the passenger service approximated 20%, (R. p. 985). This, of itself, would more than counterbalance the extra expense of maintenance claimed by the defendants to be due to greater destructive force of the freight traffic.

The testimony is undisputed that 2¾% of the time of freight trains on the road is attributable to the delays caused by the preference given to the passenger service to keep the trains in that service on time, as near as may be (R. p. 848). It would follow from this that that proportion of the wages of the freight crews and the fuel, lubricants, etc., used by freight locomotives would more properly be charged to the passenger service, the total comprising a very substantial amount.

There was also undisputed evidence that a considerable amount of cost is attributable to the passenger service on account of freight hauled for its use in freight trains, for which no charge is made (R. p. 963).

On this question of extra costs attributable to the one

service or the other there was, of course, much controversy between the parties and a large amount of testimony was introduced on both sides. We do not believe that ony one hearing this testimony could come to any other conclusion than that the preponderence thereof was in favor of the plaintiff. On this question the Trial Judge said in his opinion:

> "There is much to be said in favor of this basis of division (*i. e.* modified revenue train mile ratio) and, upon the whole record, as against those advanced by the defendants, its use is supported and sustained by the greater weight of the evidence." (R., p. 84.)

In the division of these common expenses of maintenance of way, the defendants' accountants again did not agree with the theories of the plaintiff nor with the theories of one another. For the division of these maintenance accounts Mr. Thompson and Mr. Parker, who followed the Thompson theories, used two ratios. For the division of weather expenses they used their "Time" ratio. For the division of wear expenses, they used their "Gross Ton Mile" ratio. The method in which they applied these ratios was rather unusual, in that they made no attempt to separate the accounts between weather and wear, except in a general way. For instance, if in a certain account it seemed to them that the greater portion of the expense was due to weather they apportioned it all on the time basis (R. p. 848). If on the other hand, in their opinion the cause of the expense was due to wear, they apportioned it all on the gross ton mile basis. For illustration, the acount of "Ties" they divided on the gross ton mile basis, merely because it seemed to them, in their opinion, that the greater portion of the deterioration of ties was caused by the action of the train rather than by weather (R. Vol. V, p. 548). On the other hand,

the account of "Bridges, Trestles and Culverts" they divided on the time basis, on the theory that a greater portion of the deterioration of the bridges was caused by the weather than by the action of the trains (R. Vol. V, p. 546).

Mr. Hillman, on the other hand, except as to a few accounts where he used the train mile basis, such as the account of "Roadway Maintenance", (R. Vol. VI, p. 93) uniformly applied the gross ton mile ratio to the division of nearly ever maintenance account, refusing to differentiate between weather and wear. It was, moreover, his contention that the weather items entered into the account very slightly; and that practically the whole of the maintenance cost was due to the action of the trains. In explaining this, Mr. Hillman said:

> "In computing the gross ton mile ratio, we take each car and each engine and multiply its weight by its mileage made. We multiply each ton by the distance it moves. This is on the theory that the expense of maintenance of the structure to which this ratio was applied is measured by the weight passing over it during the course of the year by the several classes of business. The ton mile is the measure of expense, because in my opinion it causes it." (R. p. 1150.)

Passing, however, from Mr. Hillman's explanation of his theory to a study of his computations, we find a surprising result. It will be remembered that he had assigned, as exclusive freight expenses, 17.28% of all the maintenance expenses as what was claimed by him by careful calculation to be the actual expense of maintenance of the exclusive freight tracks. If, therefore, we follow out, to its logical conclusion, this theory that the gross ton mile measures the expense because it causes the expense, we must expect to find that 17.28% of all the

gross ton miles must have been made on the exclusive freight tracks. No other result could follow if that theory is correct. Yet when we come to study the figures from which Mr. Hillman's gross ton mile ratio is prepared (R. Vol. VI. p. 218) we find that the percentage of gross ton miles made on exclusive freight tracks is not 17.28%, but, on the contrary, is only 4.9%. Therefore one or the other of the theories of Mr. Hillman must be wrong. Assuming, however, that Mr. Hillman was mistaken in his theory that 17.28% of the maintenance expenses were made on exclusive freight tracks and that the figures of plaintiff, 8.92%, were more nearly correct, it is still impossible to reconcile Mr. Hillman's theory with the actual results of his computations.

When the trial judge came to pass upon this disputed issue as to the division of common expenses of maintenance of way, he treated the situation just as he treated the division of the common property. That is, although he stated that the modified train mile ratio, suggested by the plaintiff, was the most logical, he decided not to follow it but to take instead the method adopted by the Interstate Commerce Commission in the Western Passenger Fares Case for dividing common expenses of maintenance of way.

He therefore used the same Interstate Commerce Commission formula used by him for the division of common property in dividing all accounts in the mantenance of way group, for the division of which the modified train mile ratio had been employed by the plaintiff (R. pp. 85-6).

The principal criticism contained in the brief of counsel for the appellants of the method used by the trial judge for the division of these common expenses of maintenance of way, is that the trial judge, in using the ratio, applied it to the whole block of maintenance of way expenses, ignoring the fact that this block of expenses in-

cluded the expenses of maintenance of a large amount of exclusive freight trackage, thereby assigning too little of the maintenance expense to the freight service. As to this, counsel for the appellants are mistaken in the fact, the mistake probably occurring through an assumption on their part that the trial judge in using this ratio applied it in the same way in which it was applied by the Interstate Commerce Commission in the Western Passenger Fares Case, where it was first used. In that case the figures presented to the Interstate Commerce Commission as to property and expenses of operation did not attempt to allocate to the freight service the exclusive freight property or the expenses of maintenance thereof. Therefore, in applying their ratio, the Interstate Commerce Commission applied it, for the division of property values between passenger and freight, to the whole of the railroad property without separation, and for the division of maintenance expenses between passenger and freight, to the whole block of maintenance accounts. It will be seen that in this method of division there was a certain amount of logic, as the expenses of fuel consumed, wages of enginemen and so forth, which made up the basis for the ratio, were occasioned through operations on the exclusive freight and exclusive passenger tracks as well as on the tracks used in common by the two services. In this case, however, the trial judge adopted a course which puts his method beyond criticism by the appellants, by first allocating to the passenger and to the freight services respectively the expenses of maintenance of the exclusive freight and the exclusive passenger tracks as shown in the books of account of the plaintiff from the reports made by its section foreman, as hereinbefore described, and by applying the ratio which he used only to the expense of maintenance of the common tracks.

That this was the method which the trial judge used,

appears very clearly from a study of his opinion and the computations which appear in that opinion.

It is there stated (R. p. 86), "At the request and under the direction and supervision of the Court, expert accountants (one from each side by agreement) have made careful, accurate and detailed computations in which the lesser percentages above stated have been applied, first, to defendants' lowest common property values, wherever time or gross weight percentages have been employed, and, second, to the common operating expense accounts, wherever the modified revenue train mile percentage had been employed, and also to the unallocated portions of the transportation expense accounts: Dispatching Trains, Station Employes and Station Supplies. The necessary changes have been made in all overhead accounts. Defendants' estimates of the values of the railroad property have been accepted. There is no dispute concerning the revenue or the totals of operating expenses. The difference between the parties in the divisions of the expense accounts, not separated, according to the new and substituted percentages, are too small materially to affect the results and, hence, plaintiff's divisions of these remaining accounts have been accepted."

It is clear from the above that the Court applied the percentage only to the *common* operating expense accounts wherever the modified revenue train mile percentage had been employed. A study of the plaintiff's exhibits where this modified revenue train mile percentage had been employed, for example, page 1 of plaintiff's exhibit 209 (R. Vol. VII) shows that that ratio had been applied only to the *common* expenses of maintenance, after allocating to passenger and to freight the expenses of maintenance of the exclusive freight and exclusive passenger tracks, as shown on that page and on page 6 of the same exhibit. As to the method by which the ratio was applied by the trial judge, the plaintiff might have made some

criticism, as it thus appears that the Court was using for the division of common maintenance expenses a ratio which included on one side expenses for operations on exclusive freight tracks, the maintenance expenses of which had already been allocated to freight, but there is certainly no ground for criticism by the defendants and appellants.

EXPENSES OF "STATION EMPLOYEES" AND "DISPATCHING TRAINS."

Apart from the expenses of maintenance of way and structures, the only other expense accounts as to which there was any serious difference in principle between the parties as to the proper method of division were three accounts under the group of transportation expenses, viz: accounts 372, "Dispatching Trains," 373, "Station Employees," 376, "Station Supplies and Expenses." These three accounts contain the amounts paid out for wages of the train dispatchers and of the employees and the supplies and other expenses at the various stations. It was agreed that a method proper for dividing account 373 would be proper for dividing account 376.

It seemed to the plaintiff that as the employees in the train dispatcher's office have almost entirely to do with the running of trains, it was very proper that the expense be divided between passenger and freight on the train mileage basis.

The plaintiff realized, of course, that a certain portion of the dispatcher's time was taken in sending messages as to switching operations, directing the switching out and picking up of cars, etc., and therefore applied to the division of this account not the straight freight mileage, but the train mileage as modified by including the switching miles made on all tracks, bringing the ratio assignable to passenger down to 37.31% for 1917.

In their attitude as to the division of this account, the defendants' accountants were consistent with their attitude on almost all other disputed questions in the case, in that they did not agree with the plaintiff nor with one another. Mr. Thompson and Mr. Parker divided the account between passenger and freight on their time ratio. Mr. Hillman, on the other hand, applied a most complicated method, illustrated on page 238 of his exhibit (R. Vol. VI), in which he divided the account into thirds, and divided one-third of the account on the train mile basis, one-third on a combination between the train mile basis and another ratio which we will refer to later which is used for dividing expenses of station employees, and one-third he assigned altogether to freight.

The account of "Station Employees" includes the wages of all the employees at the different stations on the road. At the larger stations certain of the employees are engaged exclusively in freight work, and other employees are engaged exclusively in passenger work; and the expenses at these stations are kept separately, so that for this account a portion of the expense has already been definitely allocated to passenger and to freight. The remainder of the account represents, for the most part, the wages of the men at the "one man" or "one man and operator" stations, where the employee is engaged indiscriminately in passenger and in freight work.

It was the theory of the plaintiff that this account should properly be divided on the proportion of the mileages of the various trains that passed that property and, realizing that some effect should be given to the work required of those agents and operators in looking after switching operations at the stations, the train mileage was affected by adding thereto the switching mileage made by road trains on all tracks, exclusive freight tracks as well as common tracks.

The defendants' accountants proceeded, however, to

divide the common portion of this account on a most remarkable theory. They ascertained what portions of the account had already been allocated to passenger and to freight and then divided the common expenses upon the proportion of the allocated expenses, as a result of which they succeeded in assigning to passenger, out of the common expenses, only about 12%. That their method was absolutely incorrect is apparent when a study is made of the work at the different stations where this allocated expense occurs. One of these stations is Sault St. Marie, where there is a large amount allocated to freight, for wages of freight employees, and no allocation in that account to passenger. That situation occurs because in that city the plaintiff occupies with another road a union station, and the expenses of the passenger employees there paid by the plaintiff do not appear at all in the account of station employees, but in an entirely other and different account, account 412 "Operating Joint Tracks and Facilities." St. Ignace is another station on the line where there is a large amount of allocated freight expense and a very small amount of allocated passenger. This is a small town of only 2,000 people, the passenger business being very limited and the local freight business being also very limited. But it is the main transfer point on the line, where freight is transferred from the plaintiff's road to the Michigan Central and the Grand Rapids & Indiana railroads, a large force being kept at work there transferring less than carload freight, rebilling and doing all the miscellaneous freight work required at a main transfer point. Therefore the work there is in no way representative of the work at one of the smaller stations on the road where the operator and the agent do work both for passenger and for freight. Another station whose allocated expenses they use for this division is Marquette, which is not only a transfer point for the Lake Superior & Ishpeming and Marquette & Southeastern Railroads, but is also the main division point on the

line, where all freight trains are broken up in the yard before sending them out over the next division, and all less than carload freight consolidated, thus requiring the work of a large freight force, although the passenger business is only such as originates in a small town of that size. Also at Ishpeming the large allocated freight expense is due to the fact that that is the transfer point with the Chicago & Northwestern Railway, and the same facts exist at Houghton, because that is the end of the line and the transfer point with the Mineral Range and the Copper Range Railroads. The work at none of these stations is at all illustrative of the work done at the smaller stations whose common expenses we are here trying to divide.

The Trial Judge, however, did not follow either of the parties in their method of making this division, but proceeded to divide the account on the same ratio used by him for the division of common expenses of maintenance of way, i.e., the Interstate Commerce Commission formula.

The methods used by the plaintiff in assigning expenses between passenger and freight in the years 1914-1917 is shown opposite each primary account in plaintiff's exhibits 206, 207, 208 and 209, and the ratios there referred to are all set forth and described in plaintiff's exhibit 210, all these exhibits appearing in Vol. VII of the Record.

The corresponding exhibits for the defendants constitute Vols. V and VI of the Record.

The methods of division used by the trial judge are shown in his opinion (R. p. 85-6).

Division of Michigan Passenger Operating Expenses Between Intrastate and Interstate.

It was possible to allocate some of the passenger expenses either to the intrastate or the interstate service.

Some have been divided between those services in a manner used by both parties. The remainder, which constitute the greater part of the passenger expenses, cannot be allocated and must be apportioned on some fair basis.

The general basis used by both parties for this apportionment is the relation of the miles traveled by intrastate passengers in Michigan as compared with the miles traveled by the interstate passengers therein. This is the basis used for the division of passenger property between intrastate and interstate, and except as hereinafter noted expresses most truly the comparative use of the property and the relation of the expenses chargeable to the different services.

The testimony in this case, as in all other cases of this character, is most clear and convincing to the effect that it actually costs more per passenger mile to transport an intrastate passenger than one traveling interstate, due in part to the shorter average haul of the intrastate passenger, which in 1917 was 35.30 miles as against an average haul of 115.16 miles for the interstate passenger. Inasmuch as a large portion of the intrastate passengers use for themselves and their baggage one of plaintiff's Michigan stations at each end of their run, while the interstate passengers use only one station in Michigan, the ratio of use of terminals would be nearly 10 to 1 in favor of the intrastate. This terminal expense includes not only the wages and services of the station employees, but the cost of upkeep of the station property. It would also include the element of injuries to passengers getting on and off trains, which on many railroads is a very appreciable item. Also the shorter average haul for intrastate passengers necessarily requires the making of a greater number of stops to take on such passengers and to let them off, which is reflected, in the operating expenses, in the fuel consumption, in the wear and tear on the equipment, and in the wear on the rails. (See Testimony of

McPherson, R. pp. 494-6). None of these elements of extra cost is allowed for in a division between inter and intra on the basis of passenger miles.

That there is such greater cost in the intrastate business to be taken into consideration in the case was demonstrated in the case of *Rowland, et al* vs. *Boyle*, the Arkansas Rate Case, recently decided by this Court. This Court so expressly held, saying:

> "We agree that it is proved that the local expenses are proportionately very much greater than the interstate."

If such fact was true in the case of the St. Louis & San Francisco Railroad, the carrier whose accounts were under consideration in that case, it would be true of every other railroad which carries both classes of passengers on the same train, as does the plaintiff.

While plaintiff's counsel were satisfied that there was this greater cost of carrying intrastate passengers and that the amount of the same was a large item in plaintiff's operating expenses, yet we had to admit that the amount of the same was difficult of demonstration by exact mathematical proof, and rather than to confuse the issue by a lengthy controversy on this point we decided not to carry any factor of extra cost of doing intrastate business into our computations, except as to two primary accounts, "Station Employees" and "Station Supplies and Expenses". These accounts we divided, not on the relation of passenger miles, but on the relation of the number of passengers traveling, intrastate and interstate. Inasmuch as the use of these stations is by the passengers who travel, and, so far as their use is concerned, it is immaterial how long a distance a passenger travels between stations, it would appear most logical that this division should be on the relation of the passengers and not of the passenger miles.

The division of passenger expenses between interstate and intrastate on the straight passenger mile basis for 1917 assigned 70.67% to the intrastate. An assignment of the two accounts above mentioned on the basis, not of passenger miles but on the number of intrastate and interstate passengers traveling in that year, assigned 88.71% to the intrastate.

On the question of the division of these accounts between intrastate and interstate, defendants' accountants again did not agree with the plaintiff or with one another. Mr. Parker assigned these accounts to intrastate and interstate on the straight passenger mile basis, just as he assigned all other accounts. Mr. Hillman, on the other hand, made a most elaborate series of tests and computations in an endeavor to ascertain the exact facts regarding the division of this expense. According to his testimony (R. p. 1152), he sent one of his men to each train for a period of six weeks, with a special stop watch to test the time it took the agent to dispose of a passenger and find out what kind of ticket the man was getting, whether a coupon or a card ticket, or whether interstate or intrastate ticket. From these reports he made an elaborate computation, as a result of which he found that the ratio for division between intrastate and interstate of the station expenses of 1916, the year for which he made the test, should be reduced from 88.78% intrastate, as claimed by plaintiff, to 88.07% intrastate. It is needless to say that we announced on the hearing that we were willing to accept Mr. Hillman's assignment of these expenses.

The Trial Judge in making up his computations followed the method adopted by the plaintiff.

Other Deductions from Income.

Before arriving at the net return of the plaintiff from its railroad business, it is necessary to deduct from the

revenues not only the operating expenses, but certain other items which do not fall under the head of operating expenses; such as hire of equipment, rents paid, interest paid and taxes. Taxes is the largest item and as the railroad property of the plaintiff in Michigan is assessed on the *ad valorem* basis as a whole, there was no dispute but that the proper method of apportionment of taxes is on the basis of assignments of property values. In their exhibits for 1914-1917 the defendants' accountants apportioned taxes on the basis of passenger and freight expenses, but did this only because they had, at the time, no property valuation for 1917 (R. p. 1084).

There is no disagreement between the parties as to these deductions from income.

ESTIMATED LOSS UNDER THE ACT COMPLAINED OF.

It is the contention of the plaintiff that if the act complained of is put into effect there will be a direct loss in revenues to the plaintiff, amounting to at least the difference between the revenues which are now received, and the revenues which would be received at the 2¢ rate. As a matter of fact the loss would be even greater than that, for the reason that between certain points even lower rates have to be adopted to meet the competition of carriers having shorter lines, and considering excursion fares, special rates of 1¢ a mile for state and United States troops, etc., the revenues received from the intrastate passengers would average under the prescribed rate considerably less than 2¢ per mile.

The plaintiff submitted detailed figures as to this estimated loss for each year, if the act had been in effect, examples of which calculations are plaintiff's Exhibits No. 52, before the Master (R. Vol. II, pp. 1174-8), and plaintiff's Exhibit 205, p. 9 (R. Vol. VI) on the hearing before the Court. These calculations were made by multiplying

by 2¢ the number of Michigan intrastate passenger miles for the year in question, and subtracting the result from the intrastate passenger revenues which were actually received. Due effect was given to children's half fares, to certain hauls of five miles or less, where the act complained of allows more than 2¢ a mile to be charged, and to certain fares via Negaunee and Champion, where revenues greater than three cents per mile are received. The result shows that for each of the years in question the loss in intrastate passenger revenues would have been more than $100,000. In 1917 it would have been $149,748.

It was contended by the defendants that there is a presumption that there would be an increase in travel, on account of the reduced fare, which would be sufficient to overcome any reduction in revenues, and that the Court could not conclude that there would be any loss without putting the rate into effect and learning the result.

The same contention was made and was definitely and decisively disposed of by this Court in its opinion in the case of *Rowland* vs. *Boyle*, above referred to, where the Court said: -

> "The railroad, after getting the actual returns at the 3¢ and 2½¢ passenger rate and the freight rates allowed by the Court, deducted the sums necessary to bring the revenue down to what it would have been had the state rates been followed. It is objected that this does not allow for the increase of travel that would follow the deductions. The railroad replies and the Court below found that the increase is mainly at the expense of interstate revenue when the combined local rates are less than the interstate ones. Whether this exhausts the matter or not, we are of opinion that upon this record the supposed increase is too conjectural properly to affect our conclusion. The direct effect of the reduction is plain,—the remote one is at best a guess."

Realizing that under this rule of law it is not sufficient to guess that there will be an increase of travel which will overcome the effect of the reduction in the rate, but that actual proof must be given that there will be such increase, the defendants undertook to present such proof, offering two witnesses on that point. One of these witnesses was Mr. Henry C. Adams, an economist and a professor in the University of Michigan, who testified (R. p. 1134) that "as a general proposition it is true that the reduction in any price or any rate tends to increase the volume of sales, or in this case the volume of traffic." He testified further that his personal investigation on that subject was limited to what was known as the Michigan Central Charter Case, certain litigation which arose out of the repeal of the Michigan Central Charter, bringing that property from a 3¢ passenger mile basis to a 2¢ basis. He stated that in that case the change in the basal rate was followed by considerable stimulation of traffic, but added: "I want, in fairness to the situation, however, to add that there was in connection with that situation the educational influence of the electric lines that are paralleling the Michigan Central, the education of the public to riding and using trains; so that in honesty, I should hardly like to go on record as saying that all of the increased passenger traffic following the repeal of the charter was due to the change in the price. The reduction of the rate and the education of the public came at the same time, and the education of the public came through actual travel, under reduced rates."

The other witness was Mr. Hillman, who was willing to qualify as an expert on that point just as on all other points in the case, and who testified that in the case of the L. & N. Railroad in Florida the rate was reduced from 4¢ to 3¢, and that following the reduction in the rate the earnings increased very greatly. He was forced to add, however: "I attribute that both to the growth of the coun-

try and the reduction of rates. There has been a steady growth in passenger traffic in Florida during the last decade, though this road is outside the excursion limits or belt" (R. p. 1156).

The testimony of these two witnesses w[illegible] far from sufficient to meet the burden of proof that there will be an increase in travel sufficient to meet the reduction in income due to the decreased rate. As a matter of fact, testimony on that point was altogether unnecessary in this case, for on plaintiff's road we have had, in the past, a complete test on that question. As heretofore stated, this railroad was entitled to charge, under the Statutes of Michigan, and did charge, up to the year 1907, 4¢ a mile for passenger travel. In 1907 the legislature reduced the rate to 3¢ a mile; and the railroad put that rate into effect, and the people of the upper peninsula were thereby given the magnificent opportunity of rushing into travel at the decreased rate. What effect the reduction in rates had on the statistics of travel on plaintiff's road is indicated in the following table, taken from the figures in the Record showing the number of passenger miles traveled on plaintiff's railroad in Michigan during the past fifteen years (R. Vol. II, pp. 1173, 1187; Vol. VII, Ex. 202, p. 6; Ex. 203, p. 7; Ex. 204, p. 8; Ex. 205, p. 8).

Year	*Passengers One Mile*
1902	27,730,780
1903	29,579,008
1904	27,415,002
1905	26,401,713
1906	28,697,476
1907	33,256,965
1908	32,438,206
1909	31,145,196
1910	32,813,258

1911	32,677,027
1912	31,574,678
1913	33,158,849
1914	37,955,679
1915	27,938,289
1916	29,682,083
1917	33,436,338

It will be noted that in 1907, the year in which the rate was reduced, the travel on plaintiff's railroad in Michigan amounted to 33,256,965 passenger miles. As the Act reducing the rate from 4¢ to 3¢ did not go into effect until late in the Summer of 1907, the effect of the reduction would first be seen in the statistics of the fiscal year ending June 30, 1908. If the decrease in the rate had actually stimulated travel, there would have been for that year an increase in passenger miles. On the contrary, it appears that the passenger miles decreased. There was a further decrease in 1909, a slight increase in 1910 and the 1907 travel figures were not reached until 1914. The travel again decreased and not until 1917 did the travel become anywhere near as large as it was in 1907.

Defendants attempted to meet the conclusion to be drawn from the above uncontroverted facts and figures by asserting that although the reduction in the statutory rate was from 4¢ to 3¢, the reduction in the average rate received by the plaintiff was only about two mills, and that this reduction was too slight to stimulate travel. That the reduction in the average rate was only two mills is true; and the reason of it is that prior to 1907 and after that time, a large part of our passengers, being the regular commercial traveling public, were not traveling at the rate of 4¢ a mile, but were traveling on mileage at the rate of 2½¢ a mile. The average rate was also affected by excursion fares, etc. For the man traveling on mileage there was, of course, no reduction; that man will travel any-

way. But for the people who, as the defendants assume, will, for purposes of pleasure throng our depots and mob our trains to get on to travel at the decreased rate, the reduction was complete, from 4¢ to 3¢, every one of these passengers paying 4¢ a mile before and 3¢ a mile after the reduction; and the statistics show that they did not throng our depots or mob our trains to get on them to travel at the decreased rate. As a matter of fact, as the statistics show, they paid absolutely no attention to the reduction.

To obtain sufficient additional revenue in the year 1917 to make up the loss due to the decreased rate if the Act had gone into effect, disregarding the question of added expense by reason of added travel, and disregarding the effect of the reduction in intrastate rates upon our revenues from interstate travel, we should have had to have sufficient passengers to travel 7,847,400 additional passenger miles at the new rate. To do this at the average distance traveled by each intrastate passenger in that year, we should have to carry 212,674 more passengers than we did carry. From where in the upper peninsula of Michigan are these passengers going to come?

It must be remembered and recognized that in the upper peninsula of Michigan there is no large potential traffic to develop. The Michigan Central Railroad, referred to by Professor Adams, goes through a thickly settled country, dotted with good-sized cities and villages, where there is a great traveling public who can be educated and taught to travel. But that is not the case in the upper peninsula of Michigan, which in 1910 had only 325,000 inhabitants altogether, only a portion of whom were on or tributary to plaintiff's line of railroad.

On this question the trial judge said, in his opinion:

> "The two cent rate has not been put into effect on plaintiff's railroad and no tests have been made

to determine whether the resulting reduction in fares would stimulate travel to such an extent as to offset the estimated loss. Under these circumstances, defendants insist that, before plaintiff can be entitled to a decree in its favor, it must have established conclusively not only that the statutory rate is not compensatory, but also, that its enforcement will make impossible any substantial return. This question seems to have been decided by the Supreme Court against the claim of defendants in the recent case of Rowland *vs.* Boyle, 244 U. S. 106-110.

To ascertain the loss in each year which would have resulted from the reduction of fares to two cents per mile, plaintiff has computed the amount of fares at two cents per mile for every mile of travel to which the rate could have applied and has subtracted that sum from the amount actually received under the three cent rate. It is certain that this method of computation is unfair to plaintiff, because, owing to competitive conditions, excursion rates, etc., if the two cent rate had been in force, plaintiff would not have received full two cents per mile for every passenger mile of travel. For example, in 1914, this railroad transported state troops about one million passenger miles at a statutory rate of one cent per mile. In its computations of loss, all of this travel has been included at two cents per mile. Again, in 1907, the state legislature reduced the rate from four cents to three cents. Such reduction of rate did not stimulate travel to an appreciable extent. At all events, as said by the Supreme Court in the case above cited, "The direct effect of the reduction is plain—the remote one is at best a guess." (R. p. 79).

Sleepers and Diners.

The plaintiff owns and operates its own sleeping cars, parlor cars and dining cars, and in plaintiff's tabulations and statements showing the results of its passenger op-

erations during the eight years in question, the sleeping cars, parlor cars and dining cars have been regarded as part of the equipment used in the passenger business of the Company; and their revenues and expenses have been considered as a part of the passenger business.

The defendants, however, for the first time, so far as we have been able to discover, in any rate case, have raised the novel issue that the sleeping and dining car business is an outside operation having nothing to do with the carrying of passengers and against which a full proportion of passenger operating expenses should be charged in computing the net return from the passenger business in judging the effect of the Act complained of. They arrive at those expenses by dividing the passenger trains, by comparative weight units, among (1) passengers and baggage, (2) mail and express, (3) sleepers and (4) diners. Both of their accountants apply this same theory and an illustration of their method is shown on page 522 of the Hillman exhibit, (Vol. VI of the Record), being a computation of their ratio, by which, out of the total passenger operating expenses, they assign 25.58% to sleepers, 14.45% to diners, 14.08% to mail and express and only 47.89% to passengers and baggage.

Applying this ratio, the defendants' accountants claim that in the year 1917 there was a net loss by plaintiff in the operation of its sleeping cars of $107,110; a similar net loss in the operation of its diners of $80,327; and a similar net loss in the carrying of mail and express of $8,599. As a result of these paper losses so charged they find that in that year there was a profit from the carrying of "passengers and baggage" of $539,580, of which profit $385,381 was in the intrastate passenger business. The above figures as to profits and losses are taken from page 259 of the Hillman exhibit (Vol. VI of the Record), and the results shown are both astonishing and puzzling. It there appears (foot of column 2) that the total net in-

come of the plaintiff in that year from all the business on its passenger trains was admittedly only $343,794; but, by the application of these paper losses the net income from the "passenger and baggage" business, thus segregated, was made to be $539,580 (foot of column 6), or a sum 50% greater than all of the net income from the passenger trains. An analysis of these computations shows that if the defendants' contentions are correct, not only could plaintiff stand a reduction in its intrastate passenger rates down to 2¢ a mile (assuming that the interstate rates would remain the same), but that if the rate were reduced to 1¢ a mile there would still be a net income from the "passenger and baggage" business of more than $150,000 after the deduction of all its expenses, and that if the rate were reduced to ½¢ a mile there would still be a net income of over $30,000.

But defendants do not content themselves with apportioning passenger expenses in this way. They also apply the reasoning to the apportionment of the passenger property, claiming that of all the passenger property, including the passenger proportion of the road bed, ties, rails, etc., less than 50% is applicable to the passenger business alone in figuring the net return under the prescribed rate, the remainder being charged to sleepers, diners and mail and express. The final result is that out of a total admitted railroad property in Michigan of $11,875,000 the defendants assign to intrastate passenger only about $900,000 of value. Applying the net income as found by them to the intrastate passenger property as found by them, they easily succeed in demonstrating that in the year 1914 the plaintiff was enjoying a net income from the intrastate passenger business of 51% upon the value of the property employed in that business; and in other years a net income of over 40% upon the value of that property.

It is easily seen that if this theory is a proper one to

apply, no railroad in the United States can hereafter furnish to the public sleeping or dining car accommodations except at the risk of having its passenger rates cut in half by reason of excessive passenger earnings. As a matter of fact, such a rule would altogether prohibit the furnishing of these necessary accommodations.

That such a rule, apart from the question of the extreme results reached by applying it, is not logical as a correct rule of law or economics and is not in accordance with the legislation in the State of Michigan on that subject, is, we think apparent from a brief study of the question.

In the year 1888, the Interstate Commerce Commission, for the first time, prescribed a classification of accounts, according to which the common carriers of the country were obligated to keep their books. In this classification of accounts, sleeping and dining cars were classified as an "outside" operation.

In the year 1914, evidently recognizing the impropriety of the classification, the Interstate Commerce Commission issued an order, modifying the classification above mentioned and directing that thereafter dining cars and sleeping cars should not be treated in the accounts as an "outside" operation, and that the revenues therefrom and expenses thereof should be entered as other revenues and expenses in the railroad operation. This order of the Interstate Commerce Commission is still in effect, and appears in the Record of this case as Plaintiff's Exhibit 94.

It would be merely endeavoring to demonstrate the obvious to attempt at any length to discuss the point that the operation of the dining and sleeping cars are part of the passenger business of the road.

While at their inception these cars were novelties, they are today recognized as part of the ordinary conveniences of railroad travel. Indeed, they could be well

said to be necessities of modern railroad travel. So evident is this that under a Statute which authorized a Public Service Commission to require railroads to provide equipment and service for the comfort and convenience of passenger transportation, the Commission was held justified in requiring a railroad company to operate sleeping cars even upon a branch line, where, with respect to that line, no profit in the operation could be shown. (See State ex rel M. R. Ry. Co. *v.* Atkinson (Mo.) 192 S. W., 86).

In *Chesapeake & Ohio Ry. Co.* v. *Public Service Commission (W.Va.)*, 89 *S. E. Rep.*, 844, under a statute which required all public service corporations in West Virginia to

> "establish and maintain adequate and suitable facilities, safety appliances or other suitable devices, and shall perform such service in respect thereto as shall be reasonable, safe and sufficient for the security and convenience of the public, and the safety and comfort of its employes, and in all respects just and fair, and without any unjust discrimination or preference."

it was expressly held that it is within the power of a public service commission to require, under proper conditions, sleeping car service: the court saying:

> "The terms 'convenient and adequate facilities' are not susceptible of exact definition; they are relative terms, and must be interpreted in the light of the conditions existing at the time of their application, and the habits and customs then prevailing. Facilities for traveling which might have been considered entirely adequate and convenient 50 years ago would certainly not be so regarded now. The introduction and general use by railroad companies

of parlor cars, sleeping cars, dining cars, and vestibule trains have made a public necessity of what would formerly have been considered a great luxury."

It was further held in this case that additional sleeping car service might be required of a railroad company, even though the same could not be given profitably, the court saying that

> "the additional service may not be remunerative within itself is not the sole test of confiscation in such cases. All of the carrier's intrastate earnings from *passenger traffic* must be taken into account in determining that question, and it does not appear that such earnings do not produce a fair and reasonable profit to petitioner."

In support of this proposition the court cites as authority *Atlantic Coast Line* v. *North Carolina Corporation*, 206 *U. S.*, 1; *C. B. & Q. R. Co.* v. *R. R. Com'n of Wis.*, 237 *U. S.*, 220.

The act creating the Michigan Railroad Commission, Sec. 4 (Compiled Laws of Michigan, Sec. 8112, passed in 1909) provides:

> "Every common carrier is hereby required to furnish reasonably adequate service and facilities, and shall provide and furnish transportation of passengers and property upon reasonable requests therefor," etc.

We submit that this language gives not less full power to the Michigan Commission than was given in the Missouri and West Virginia cases referred to.

So well recognized is the fact that sleeping cars are essential to the comfort and convenience of passengers that Mr. Thompson, the expert of the defendants in this

case, testified (R. p. 871) that it would be a very foolish and absurd business policy for the plaintiff to discontinue the operation of these cars.

Moreover, long before 1909 the State of Michigan recognized the operation of sleeping cars by railroad companies as a part of their transportation machinery, and proper to be used for that purpose.

In 1875 the following statute was enacted in Michigan, the same being sections 5252-3 of the Compiled Statutes of 1897:

> "Section 1. The people of the State of Michigan enact: It shall be lawful for any railroad company operating any railroad within this state, to construct or use for the transportation of passengers, sleeping cars, parlor cars, or chair cars for the use of such passengers as may desire to use the same, and such company may make such reasonable rules and regulations concerning the use of these as such company may think proper, and may charge a reasonable compensation for such use, in addition to the regular passenger fares allowed by law.
>
> Section 2. Nothing herein contained shall release any such railroad company from its obligations to furnish first-class passenger cars for the use of the public for the regular passenger fares now fixed by law."

It will be noticed that the Legislature, in this enactment, expressly provided that it should be lawful for any railroad company in Michigan to use sleeping cars, parlor cars or chair cars "for the transportation of passengers." This puts beyond question the fact that the operation of these cars was not an "outside" operation, but that they constituted merely equipment to be used in the passenger business of the Company.

The act further provided in section one, that a rail-

road might charge persons using these cars, a reasonable compensation for such use, in addition to the regular passenger fare allowed by law. Here again is recognition of the fact that these cars are appliances to be used in the passenger business of the company. The charges for the use of these cars are to be in addition to the regular passenger fare; the charges are added, not separated.

The only condition imposed by the Legislature in this Act upon the railroads using sleeping cars, is found in section 2 of the Act, which provides that nothing therein contained should release the railroad company from its obligation "to furnish first-class passenger cars for the use of the public for the regular passenger fares now fixed by law." At that time, passenger fares allowed by law in the Upper Peninsula of Michigan were 5¢ per mile. The Legislature assumed that railroad companies could profitably operate their passenger service, even when furnishing sleeper and parlor cars, while they enjoyed a rate of 5¢ per mile for passenger transportation. In this particular the Legislature was entirely right. Sleeping cars were put upon trains in the Upper Peninsula and were operated without question under this act, while the rate of 5¢ per mile was in force. They continued to be operated without question even under the rate as reduced subsequently, from 5¢ to 4¢ and from 4¢ to 3¢.

The defendants evidently construe the second section of the statute quoted as preventing the consideration of the operation of these cars in the determination of the validity of the rate fixed by the Act of 1911. This is a clear misapprehension of the statute. As was said, at the time the Act was passed, the rate in the Upper Peninsula was 5¢ per mile. The second section of the Act did not refer to any rate which might at any future time be fixed by legislative enactment; on the contrary, the Act was very carefully written to meet the conditions as they then existed, namely the 5¢ rate. It was "the regular passen-

ger fares now fixed by law," that the Act preserved. This was the 5¢ fare in the Upper Peninsula. Inasmuch as the second section is definitely and precisely limited, to the rates in force at that time (in 1875), it needs no further discussion to demonstrate the fact that the contention of counsel for defendant as to the scope of the Act is unsound.

Moreover, with respect to dining cars, there is a further fact throwing light upon this subject. The providing of a dining car service is not only providing a convenience and comfort to the traveling public which is now universally demanded and provided, but it also has an element of eliminating expense of the railroad company which would otherwise become necessary. Passengers must be fed while en route, and in the absence of dining cars, dining stations would have to be provided. To provide stations in a sparsely settled country is expensive, and the stopping of trains and delays incident thereto adds to the expense. Mr. Thompson, the expert of the defendants, testified in this case, saying (R. p. 871), that the plaintiff company could not discontinue the dining car and sleeping car service on its line; "that it would be foolish to attempt it."

Inasmuch, therefore, as these dining cars, parlor cars and sleeping cars are provided by the plaintiff company and used by it in the transportation of passengers, and as they constitute an ordinary, if not a necessary convenience for the traveling public, and inasmuch as the testimony clearly shows the necessity of these appliances in the passenger business of the plaintiff company, it is beyond reasonable question that these facilities and their operations are part of the facilities and operation of the passenger business of the plaintiff company, and in the making up of the showing should be so treated.

That the Legislature which passed the act in question so considered them is apparent from a study of the act

itself. It is there provided that the rate of fare shall not exceed two cents a mile for all companies "the gross earnings of whose *passenger trains,*" as reported to the Commissioner of Railroads, equaled or exceeded $1,200 per mile of road.

In determining what railroads shall come under the act, the Legislature considered the train as a unit, and the aggregate of all the gross earnings of the train per mile, from every source, including the earnings from passenger fares, from excess baggage, from the carriage of mail, express and milk, from sleeping car fares, and from dining car charges, is made the determining factor. Can it be possible that the Legislature, having taken the whole of the gross revenue of the train for the purpose of application of the act, could have intended that in computing the net revenue, the expenses of operation of only a portion of the train should be considered?

If the Legislature had intended to regard the carriage of mail and express and the operation of sleepers and diners as outside operations, is it reasonable that they would have included the gross earnings from carrying mail and express and from sleepers and diners in the measure used for ascertaining what railroads could carry passengers and their baggage at given rates?

The Trial Judge was unable to see any logic or merit in this contention of the defendants, and declined to make any special allowance in his figures for the cost of sleepers and diners as an outside operation. The opinion of the Court on this point was as follows (R. pp. 79-81):

> "It is believed that, in this case, for the first time in the history of railroad rate litigation in this country, the surprising claim has been put forth that, in computing net income and rate of return, no part of the expense of hauling sleeping, dining and chair cars should be included in the passenger operating expenses of the railroad. This contention,

which is urged with earnest insistence, involves the theoretical cutting of each passenger train into sections and charging to the sleeper and diner section a proportionate part, based upon weight, of all operating expenses, without crediting that section of the train with any part of the passenger fares collected. In their computations, defendants have charged to sleepers and diners a proportionate part of each operating expense account (except those in the "traffic" group) including such constant accounts as superintendence, wages of trainmen, and engi nemen, maintenance of fences and crossings, and other of like character. The aggregate of these charges, averaging about $175,000 per year, has been deducted from the passenger operating expenses and set aside and disregarded in obtaining the net income from passenger service. In the last analysis, defendant's theory rests upon the assumption that the railroad company is not required by law to furnish sleeper and diner service and that there is, at all times, sufficient space in the day coaches for the accommodation of the traveling public. If this contention were sound, it is safe to say that no railroad of plaintiff's class in the State of Michigan could hope to win a rate case like the present one. But the contention is not sound. As early as 1875, railroads in Michigan, were authorized by Legislative enactment to use sleeping cars, parlor cars and chair cars for the transportation of passengers and to charge a reasonable compensation for such use in addition to the regular passenger fares allowed by law. 3 How. Stat. (2nd Ed.) Section 6696. That statute has been in force and acted upon for more than forty years. Every railroad of any considerable size in the state is furnishing such service. What formerly may have been a convenience has become a necessity. It is conceded that it would be poor business policy for any railroad to abandon the operation of these cars. In 1911, when the statute here under consideration

was enacted, these conditions had long existed and it must be presumed that the Legislature had such conditions in mind and, in the absence of express declaration to that effect, did not intend to limit, alter or overturn fixed and prevailing methods of railway travel and operation. Indeed, the statute itself empowers the railroad company "to regulate the time and manner in which passengers and property shall be transported" and thus, in express terms sanctions the use of all reasonable facilities for the transportation and convenience of the traveling public. No claim is made that the use of such cars is either unreasonable or unnecessary. It is also probably true that the State Railroad Commission, clothed as it is with broad powers, could compel this plaintiff to operate chair, sleeping and dining cars.

Referring once again to the statute here under consideration, we find that therein railroads are classified upon the basis of the gross earnings of passenger trains. No distinction is made between sleeping cars and day coaches. While this classification is not in any wise controlling of the exact question here presented, it is a recognition of the fact that the operation of these special cars is an integral part of the passenger service from which it cannot be divorced by fine spun theories unknown in actual experience and practice.

A subordinate claim of defendants is that, if the operation of sleeping, dining and chair cars cannot be wholly eliminated from consideration, at least the expense of hauling such cars should be divided between state and interstate business upon the basis of the interstate and intrastate passenger miles traveled therein instead of the interstate and intrastate passenger traffic upon the whole line. Elaborate schedules and tables have been prepared showing the number of interstate and intrastate passenger miles in sleeping cars upon each division of the

road. Upon one division the intrastate travel in such cars far exceeds the interstate, while the reverse is true upon the other divisions. This theory is equally untenable. The passenger train as a whole, with engine, baggage cars and all coaches, is a single unit provided for the transportation of interstate and intrastate passengers indiscriminately and alike. The train is run regardless of whether interstate or intrastate, or both interstate or intrastate, passengers are to be carried. Neither kind of traffic is incidental to or subordinate to the other."

The defendants recognized the extreme results to which the application of their theories leads, but stated that it is incumbent upon the plaintiff, if it wishes to avoid these enormous losses in its sleeping car and dining car operations, to increase its sleeping and dining car charges to an amount sufficient to take care of this loss. Defendants' theory upon which they base their whole argument is that the Legislature in passing the Act specifying the 2¢ rate of fare did so on the assumption that the public, as a whole, desires to travel only in day coaches and without arrangements for meals; and that to those passengers who use the sleeper and diner privileges should be charged a large additional sum, sufficient to take care of this extra cost. When it was pointed out to the defendants that the Interstate Commerce Commission has already fixed a limit for sleeping car fares, above which limit the carrier can no longer charge, the defendants' retort was that there should be, in addition to the ordinary berth fare, a special mileage charge for the privilege of riding in sleeping cars. It has been their contention that the rates of fare fixed in the past for such services have been entirely too low and discriminatory in favor of the interstate passengers, whom they assume are the only people who travel in sleepers, as against the intrastate passengers, whom they assume always travel only in day coaches; and that

if the "public" were in charge of the operation of the railroads, an equitable adjustment of fares would be made to take the place of this alleged inequality.

Let us see what has happened along this line since the hearing of this case in the Court below, for the taking over of the railroads by the Government of the United States and their operation under Federal control have been matters of such public interest that we think this Court will take judicial notice of them. In December, 1917, the Federal Government took over the operation of all the important railroads, and in May, 1918, the Director General filed new passenger tariffs effective June 1. In these tariffs, not only were the rates of fares increased to 3¢ a mile over the whole of the United States, but an extra charge of ½¢ a mile was imposed for travel in standard sleepers and ¼¢ a mile for travel in tourist sleepers, in addition to the regular sleeping car charges. At last the "public" had obtained control and had made this equitable adjustment of fares! But, as so often happens with untried theories, it was discovered, as might have been anticipated, that instead of the theory working out advantageously for the public, it did not so work out, and the excess charge for travel in sleepers was discontinued within six months after it had gone into effect. Again the methods of operating under private management, learned through long experience, were demonstrated to have been based on sound principles, not only of corporate policy, but of public policy.

Mail and Express.

Plaintiff hauls on its passenger trains certain cars for the carrying of the baggage of its passengers; and on such cars it also carries mail and express. For the carriage of mail, the plaintiff receives certain revenues at rates fixed by the Federal Government. For the carriage of express, plaintiff receives from the Express Company

a certain proportion of its gross revenues from the express business on that line. Plaintiff's express business is let out to competitive bidders and the revenues it receives therefrom are the best revenues which it is able to obtain for the service which it gives to the express company. Plaintiff is not a common carrier of either mail or express.

The mail and express business is done on passenger trains and with very little extra expense to the road by reason thereof, as the mail and express is all carried in cars which have to be hauled on the trains anyway for the carriage of the baggage of the passengers. Plaintiff's method of handling the mail and express business, as an accounting proposition, has been to consider the mail and the express revenues as passenger revenues, and to apportion them between intrastate and interstate passenger on the basis of the relation of the other intrastate and interstate passenger revenues. No separate account is kept of mail or express expenses (in fact it would be quite impossible to keep any such separate account) and all the expenses of the passenger trains, as well as all the revenues from the passenger trains are assigned into the passenger accounts, a method very fair to the defendants, as the revenues from that business are much greater than the extra expenses occasioned thereby.

The defendants claimed that the hauling of mail and express on plaintiff's passenger trains is a separate business in itself and that its revenues and expenses could not be properly included in plaintiff's passenger operations in determining the net return from the rate complained of. They insisted that the proper proportion of all passenger operating expenses should be assigned to the mail and express business, using as a basis the proportion of the space in the train occupied by and used for that business, worked out in terms of tons by means

of the figures used by defendants in computing their gross ton mile ratio for the division between passenger and freight. On this basis the defendants figured that out of the total passenger operating expenses in 1917, 14.68% thereof, or $77,743 (R. Vol. V. p. 712), was assignable as the expense of carrying mail and express. Defendants include in this sum not only 14.68% of all train expenses, but also 14.68% of the expenses of maintaining the road bed, general expenses, etc. (R. Vol. V. pp. 543-668). These expenses, as thus computed, were $8,616 in excess of the mail and express revenues (R. Vol. V. p. 712); so that the plaintiff was carrying mail and express during that year at a large loss. If the defendants had divided the operating expenses between passenger and freight in the same manner as they were divided by the plaintiff, thereby assigning a greater proportion to passenger, the loss in the mail and express business would have been even larger, amounting to about $18,000 in 1917. The defendants also, before figuring out their return on property values, deduct from the total passenger property, including the road bed, ties, rails and the whole track structure, about 14% thereof, which they charge to mail and express as property devoted to that business, on the same theory of direct apportionment.

The Master agreed to this contention of the defendants and made a separate assignment of the mail and express business, deducting the revenues from such business from the plaintiff's passenger revenues and deducting from plaintiff's passenger operating expenses the amount which the defendants' theory and ratio showed should be deducted, including the deduction of the proportionate amount of the taxes. These separate computations for the mail and express business are shown in the Master's Report (R. Vol. III pp. 297-301).

The plaintiff, in the computations which it presented to the Court of the operations of the four subsequent

years, followed this method adopted by the Master, protesting at the same time that the method was unsound and illogical. The Trial Judge agreed with plaintiff's contention in this regard (R. p. 81).

This question now coming on in this Court, we shall present here somewhat briefly the argument which we made before the Trial Judge.

Every railroad, or at least this railroad, in undertaking the mail and express business is faced with this problem: It has a passenger train, which runs on regular schedule and must run every day regardless of how many passengers there are to take such train, if there is an average number of passengers more than sufficient to pay the cost of operation. It has a baggage car on which it must carry the baggage of those passengers; and it is offered an opportunity to obtain some additional revenue by carrying mail and express in those baggage cars. There is not sufficient mail and express business to allow the running of special trains for its accommodation. If it cannot move on passenger trains, it cannot move at all; and it has to be carried on passenger trains because the express business cannot compete with the freight business, if carried on freight trains; and because the Government would not be satisfied with slow freight service for the carrying of mail. In considering the question as to whether the railroad can afford to take on this extra business, the railroad officials consider it only from the business standpoint of how much it will increase the expenses. If they find from their study that it will not increase the expenses to an amount greater than the additional revenue, and will not delay or hinder the passenger traffic, they accept the business, consider all the earnings as passenger earnings and make no attempt to separate the extra expenses which there may be, due to this traffic. It is obvious that if every proportionate part of the cost of running the passenger trains is charged

against these mail and express operations upon a tonnage basis, the business cannot pay. If, however, the business is treated as a by-product of the passenger business, the extra expense of which is very small, the revenues from that business thereby become so much added revenue for the road; and the business is a profitable one to accept.

The mail and express revenues are on a par with other incidental revenues of the road. For instance, the plaintiff derives a small revenue from the carriage of milk on passenger trains. Because of its desire to serve the public, and because milk as a commodity cannot afford to pay a high rate, the charge made for the carriage of milk is a very reasonable one; but if the cost of carrying that milk should be charged up against the passenger service on a direct weight basis, it would be impossible to carry it except at a tremendous loss. Another example is the revenue which the plaintiff derives from allowing the Union News Company the right to use its trains for the selling of newspapers, magazines, candy, etc. The newsboy occupies a considerable space in the trains, considering the one or two seats in the smoker which he uses for keeping his supplies and the constant use which he is making of all the coaches in the train going up and down the aisles, and if the direct cost of transporting that newsboy should be charged against him on a basis proportionate to the use which he makes of the train, compared with the use made by the ordinary passenger, the expense charged against that newsboy would be so great that the News Company would have to abandon its concession. It is apparent that the railroad by abandoning the milk business and giving up the newsboy concession would gain nothing whatsoever and would lose this amount of revenue. We think it would appear logical to any railroad operating official that it would be wise for him as a business proposition to accept mail and express and milk

business and to grant a news concession. But if by accepting this business he is compelled to lower the fares paid by passengers to a rate such that the passenger will not be compelled to pay any more per unit of weight or space on the train than is paid by the mail or express or the milk or the newsboy, the whole passenger business becomes a losing proposition.

It was argued against our position that this Court had decided in the so-called Lignite Case, *Northern Pacific Railroad* vs. *North Dakota*, 236 *U. S.* 585, that every portion of the traffic must bear its own proportion of the expense.

This argument appears plausible until we study just what question was litigated and decided in the Lignite Case. That action was one brought by the Northern Pacific Railroad against the State of North Dakota to enjoin the State from making the railroad carry lignite coal at rates fixed by statute, on the ground that the rate fixed was too low. This court agreed to that contention and held that the railroad could not be compelled to carry that traffic at an unremunerative rate, even if it was more than the "out of pocket" cost; but they expressly stated that they did not mean by their decision to hold that all traffic must be carried at the same rate.

In view of this statement let us assume that in the Lignite Case the issue instead of arising in the way in which it did, had arisen in another way. Assume that the managers of that railroad had carefully considered that lignite traffic; had found that it was a large traffic, but one that would have to move at a very low rate because of its being a very low grade commodity; that it would move at convenient seasons of the year, when there was much idle equipment, and would bring in considerable revenue, more than the extra "out of pocket" cost; and, upon all these considerations, had decided to accept the business; and the shippers of wheat had then brought

an action before a Commission to have their rates reduced on the ground that the railroad was not charging for the lignite traffic the full proportionate cost of the carriage. Could these shippers of wheat have succeeded in having the court reduce their rate so that they could have their wheat carried at the same rate as the lignite? Such a ruling would alter the whole theory of the making of freight rates, which theory is that rates must be made to suit commodities. On plaintiff's railroad there is a very considerable log traffic and a large coal and ore traffic, all of which must be carried at low rates in order to allow the commodity to move. For the carriage of flour or refined copper and merchandise, much higher rates are charged. Can the shippers of merchandise and of flour and of copper have their rates reduced on the theory that the plaintiff does not apportion to the log traffic the whole pro-rata expense per ton for carrying it? We do not think that the defendants themselves would ever make that claim. But in apportioning to the carriage of mail and express the same pro-rata expense that they apportion to carriage of passengers, they attempt to establish a claim that is just as illogical as the one above suggested. They arbitrarily assume that a ton of mail or a ton of express is the exact equivalent of a ton of passengers, utterly ignoring such fundamental principles of rate-making as the nature of the traffic; the manner in which it moves; the risk involved; the value of the commodity, and the ability of the traffic to stand the rate; all of which things must be taken into consideration in making up commodity rates.

It seems to us that in a case of this kind the mail and express business must be treated in either one of two ways. (1) Having first figured that the revenue derived from the business is more than the "out of pocket" cost, so that there is no direct loss on the business, to give the passenger business the credit of all these mail and ex-

press revenues, and consider all expenses as passenger expenses, just as plaintiff did in its original computations. If such a course is followed no claim can be made that the passenger business is in any way harmed, but on the contrary, it is clear that the passenger business cannot but be helped to the extent of the addition in revenues over the additional expenses. (2) By finding some other method of apportioning expense between passenger and mail and express than by a comparison of tons. The rate to be charged for carrying passengers and the rate to be charged for carrying express can no more be fixed at the same amount per ton than could the same rate per ton be logically fixed for carrying coal and carrying silk. If any jurist or economist has ever devised a logical basis for apportioning expenses of carrying express and carrying passengers on the same train we are unable to find it set forth in any book, treatise or judicial opinion, nor have we ourselves been able to discover any such basis.

We believe, on the other hand, that if defendants' theory of apportionment were ever made a rule of law and passenger rates were adjusted accordingly, there would be no railroad in the United States which would not have to abandon its mail and its express business as an unprofitable and losing proposition.

We submit that whether mail and express shall be carried on passenger trains and the rates to be charged for such carriage, are matters resting in the sound judgment and discretion of the operating officials of the road. Unless it is shown that the judgment has been so unwisely exercised that serious wrong is being done to the public, it is not for state officials to lay down other rules or to substitute their own judgment for the judgment of the owners of the property, who are presumably operating it with due regard to their duty to the public.

As to how mail and express shall be treated in this

particular case, we would refer again to the statute in question, which provides that in determining what railroads shall be limited to the two cent rate, the gross revenue per mile from all *passenger trains* (including therein the revenue from mail and from express) is made the determining factor.

MINERAL RANGE RAILROAD.

Certain of plaintiff's trains are run from Houghton, the terminus of one portion of plaintiff's line, to Calumet, over the tracks of the Mineral Range Railroad. The latter railroad is a separate corporation, about 51% of the stock of which is owned by the plaintiff, but is separately managed and separately operated. Calumet, though not itself a large town, is, by reason of its position in the center of the copper mining district, the largest center of population and of potential passenger traffic in the upper peninsula. Originally the Mineral Range Railroad ran its own trains from Houghton to Calumet; but about fifteen years ago the construction of a parallel electric line diverted so much of the local traffic that the operation of trains between such points was no longer profitable and the railroad abandoned such operation. In order therefore, for the plaintiff to get the traffic from Calumet, it was necessary either to depend upon the people coming to Houghton over the traction line and there taking plaintiff's road or for plaintiff to make an arrangement whereby it could run its trains to Calumet over the Mineral Range tracks. The first proposition was altogether unbusinesslike, for the reason that there is running from Calumet to Chicago a competing road, the Copper Range Railroad, connecting with the Chicago, Milwaukee & St. Paul Railroad, making a through competitive line to Chicago and to southern Michigan via Chicago, such line also reaching other points in the upper peninsula of Michigan

in competition with plaintiff's line. Therefore an arrangement was entered into by the plaintiff with the Mineral Range Railroad by which plaintiff was allowed to run its trains from Houghton to Calumet for the purpose of obtaining this traffic. The first arrangement was for the plaintiff to pay the Mineral Range Railroad a certain fixed rental for the use of its tracks. Later this arrangement was changed so that in lieu of a fixed rental the Mineral Range Railroad is given all the passenger revenues which are derived from travel over its tracks, including the local travel between Calumet and Houghton and the proportionate amount of the charge representing the through travel, with a guaranty that those fares shall in no year amount to less than a certain sum fixed as a fair rental for the trackage rights.

Certain connections of the plaintiff, the Chicago & Northwestern and the Chicago, Milwaukee & St. Paul railroads, were also anxious to reach Calumet. Therefore the Chicago & Northwestern railroad entered into an arrangement with the plaintiff whereby a train could be run straight through from Calumet to Chicago, and from Chicago to Calumet. The Chicago & Northwestern railroad hauls the train from Chicago to Ishpeming, and there delivers it to the plaintiff, which takes the train with its own locomotive and train crew, but with all the rest of the Chicago & Northwestern equipment, through to Calumet, and on the return trip delivers the train again to the Chicago & Northwestern railroad at Ishpeming. In a similar manner, the Chicago, Milwaukee & St. Paul railroad hauls a through train up from Chicago to Champion, delivers it there to the plaintiff, which takes the train on to Calumet and on its return delivers it to the Chicago, Milwaukee & St. Paul railroad again at Champion. For hauling these two trains to Calumet and back each day over its tracks, plaintiff obtains not only the use of their foreign equipment, but also obtains all the

passenger fares collected for travel on its lines, including all the local fares and its proportion of the through fares, and in addition, each of the foreign railroads pays it a bonus for running such trains; the aggregate of which amounts to over $14,000 a year, all of which goes into plaintiff's passenger revenues. It was shown that if the trains of plaintiff ran only to Houghton and did not go through to Calumet to reach this large center of potential traffic, such arrangements would not be made by the connecting carriers, nor the bonuses paid (R. pp. 1156-9).

The great advantage which the plaintiff obtains from running its trains through from Houghton to Calumet, aside from the use of this foreign equipment and the bonus paid for the foreign trains, is that it is thereby able to obtain a large part of the traffic destined from the copper country to the lower peninsula of Michigan, in competition with the three routes via Chicago. A passenger from Calumet desiring to go to Detroit can go by any of four routes. He may go via the Copper Range and the Chicago, Milwaukee & St. Paul via Chicago, not touching plaintiff's lines at all. He may go via plaintiff's lines as far as Champion, and from there to Chicago via the Chicago, Milwaukee & St. Paul. He may go via plaintiff's line to Ishpeming and from thence via the Chicago & Northwestern Railroad to Chicago. Or he may go via plaintiff's railroad across the straits of Mackinac to Mackinac City and thence by the Michigan Central Railroad to Detroit. On any of the three first named routes the passenger will be compelled to cross the city of Chicago after his arrival there, to get his connection to Detroit, while if the fourth named route is taken, he can at Mackinac City make the connection by stepping across from one train to another, a very potent argument in soliciting the traffic of women and children. If the passenger takes this last named route the plaintiff gets the haul for almost the whole length of its line.

The plaintiff, in presenting the results of its operations in this case, has, as a matter of course, included among its operating expenses the expenses of running these trains from Houghton to Calumet, and has included in its revenue statements the revenues derived therefrom. The defendants raised no question as to this on the hearing before the Master. When presenting their figures before the Court, however, the defendants made the claim that the plaintiff should not be allowed to charge in its operating expenses any of these expenses for running its trains from Houghton to Calumet; and in their computations they made a deduction from plaintiff's operating expenses of nearly $20,000 to cover what they claimed was this unauthorized outlay. The distance from Marquette to Calumet is about 98 miles, from Houghton to Calumet about 14 miles, and the method of apportionment adopted by the defendants' accountants was to apportion to operations on the Mineral Range Railroad 14/98 of the train expense from Marquette to Calumet, amounting, as before stated, to nearly $20,000 annually.

The Trial Judge disposed of this question in his opinion as follows (R. p. 78):

> "The claim is that in computing net income, this sum of about $20,000 should be deducted from plaintiff's operating expenses. This contention is untenable. Plaintiff's contract with the Mineral Range Railroad Company is in effect a lease of the right-of-way for passenger trains from Houghton to Calumet in consideration of the passenger fares collected upon that part of the line. Plaintiff's purpose in making the contract was to secure traffic upon its own rails. If plaintiff had leased the right-of-way for the sum of $20,000 and had collected and retained the passenger fares, no question could arise as to its right to include in its operating expenses the rental so paid. Viewed from another standpoint,

this expense is similar to that of advertising and of commissions to outside agents to obtain traffic. No question is raised as to the right to include such charges in operating expenses. Moreover, it appears from the Record that plaintiff receives from the Chicago & Northwestern Railroad Company and the Chicago, Milwaukee & St. Paul Railway Company the sum of $14,000 per annum in addition to passenger fares for hauling the trains of those companies over plaintiff's line to Houghton and thence to Calumet. The main consideration for the payment of this money is to enable those companies to reach Calumet. In computing plaintiff's net income, this sum of $14,000 has been included in its earnings."

Western Division.

South Line from Marquette to Ishpeming.

As shown on the map appearing as the frontispiece of this brief, plaintiff's railroad runs west from Sault St. Marie to Nestoria, where one portion of it branches up to the copper country and the other portion goes straight west as a through line to Duluth. This line from Nestoria west is called the Western Division, and the strange claim is made by the defendants that in computing the revenues and expenses and property of the plaintiff in connection with this case, we should not consider the operations on the Western Division, for the reason that it appears that the operations on that division, so far as the intrastate passenger business is concerned, are not profitable.

In reference to this contention we shall say, in the first place, that if it were not for the through business which we get by the operation of that division of the road, the railroad might as well go out of business. In the second place, if we should at any time attempt to abandon intrastate passenger business on that division, there would

be such a protest from all settlers along that road that the Michigan Railroad Commission would, under their powers, compel us instantly to resume the service.

When the stockholders of the railroad undertook to construct that Western Division, they were authorized under the statute to charge 5¢ a mile for the carriage of Michigan passengers; and there is no question that if the railroad were allowed today to charge at that rate, the operation of that division would be in itself profitable. In this respect this case is much different from the Arkansas Case cited by defendants, where a railroad constructed an unprofitable branch under an existing rate and then in subsequent litigation claimed that the rate was confiscatory.

The same arguments are applied by defendants to the so-called South Line, which extends from Marquette to Ishpeming.

These arguments are all effectively answered by the trial judge in his opinion (R. p. 77-8):

> "The so-called Western Division (Nestoria to the State Line) of plaintiff's line was originally built as a connecting link and primarily to create a through interstate road. This part of the railroad runs through a sparsely settled region and the local traffic thereon is considerably less than that upon other divisions of the system. Here the interstate traffic exceeds the intrastate. However, the traffic of both kinds has continuously and substantially increased. Defendants claim that the loss, if any, in plaintiff's passenger business has occurred upon this division and contend that the operations thereon should be segregated from the operations upon other divisions and the loss charged mostly, if not wholly, to interstate business. They further claim that it was incumbent upon plaintiff to make such separation and, not having done so, it has failed to establish with sufficient certainty any right to relief.

The so-called South Line extends from Marquette to Negaunee and Ishpeming and was originally built by an independent corporation as a competing road. In 1884, after it had been operated for about one year, one of plaintiff's predecessors purchased this line. Since then it has been used continuously for both interstate and intrastate passenger and freight traffic. Its use in connection with the main line provides substantially a double tracked road between those cities. Defendants claim that the South Line is unnecessary so far as intrastate traffic is concerned and contend that both the revenues derived therefrom and the expenses incurred thereon should be eliminated from the computation in this case.

These contentions are effectually answered by the rate statute itself, which provides "That in computing the passenger earnings per mile of any company, the earnings and mileage of all branch roads owned, leased, controlled or occupied, or that may hereafter be owned, leased, controlled or occupied by such company, * * * shall be included in the computation, and the rate of fare shall be the same on all lines owned, leased, controlled or occupied by such company". Plainly, no division or branch, used for intrastate traffic can be segregated from the other parts of the line or omitted from consideration in determining whether a statutory rate is confiscatory or sufficiently compensatory. The Legislature, in fixing the rate of passenger fares, has seen fit, at the same time and in the same statute, to require the entire railroad line to be treated as a single unit. Under this statute, if the net income derived from plaintiff's intrastate passenger business as a whole is sufficient to yield a fair and reasonable return upon the value of the property employed in that service, it cannot recover, even though it may have suffered serious loss upon one or more divisions of its road. On the other hand, if the net income de-

rived from its intrastate passenger business upon its whole road in Michigan is insufficient to yield a fair and reasonable return upon the value of the property employed in that service, it is entitled to a decree, even though such business upon one or more of its divisions may have been profitable. Court decisions upon rate statutes containing no such provisions have little application and are not controlling here."

NET RESULTS FROM PLAINTIFF'S INTRASTATE PASSENGER OPERATIONS.

Applying to the division of operating expenses and income the same view from perspective which we employed in studying the results of the different methods of dividing common property, let us step back and see how the results of the divisions, as made by the plaintiff and by the defendants, compare.

The following table shows this comparison. The figures making up this table are taken from the Record, as referred to in the foot notes, most of the figures in the first table being taken from plaintiff's Exhibit 220 (R. Vol. II, pp. 1191-1199), and in the second table from the Parker (defendants') exhibit (R. Vol. V, pp. 160, 330, 518 and 712). As a basis for making the comparison, we take the property valuation as claimed by the defendants and the division of the same between passenger and freight as made by the trial judge.

1914	Plaintiff Total Mich.	Freight	Passenger
Defendants' Valuation	$11,674,752[2]	$8,593,129[3]	$3,081,623[3]
Actual Net Income	417,869[3]	165,398[4]	252,471[4]
Percentage on Value	3.57%	1.92%	8.20%
Estimated Loss	196,046[9]		196,046[9]
Net Inc. after deducting loss	221,823[4]	165,398[4]	56,425[4]
Percentage on Value	1.67%	1.92%	1.96%
1915			
Defendants' Valuation	11,697,474[3]	8,370,131[3]	3,327,343[3]
Actual Net Income	405,948[3]	270,167[3]	135,781[3]
Percentage on Value	3.47%	3.10%	4.08%
Estimated Loss	167,535[10]		167,535[10]
Net Inc. after deducting loss	238,413[3]	270,167[3] Def.	31,754[3]
Percentage on Value	2.01%	3.10%	0%
1916			
Defendants's Valuation	11,526,134[3]	8,452,464[3]	3,073,670[3]
Actual Net Income	767,753[3]	574,757[3]	192,996[3]
Percentage on Value	6.67%	6.80%	6.29%
Estimated Loss	176,641[11]		176,641[11]
Net Inc. after deducting loss	591,112[3]	574,757[3]	16,355[3]
Percentage on Value	5.14%	6.80%	.53%
1917			
Defendants' Valuation	11,875,868[3]	8,986,220[3]	2,889,648[3]
Actual Net Income	732,084[3]	519,617[3]	212,467[3]
Percentage on Value	6.15%	5.78%	7.37%
Estimated Loss	218,234[12]		218,234[12]
Net Inc. after deducting loss	513,850[3]	519,617[3] Def.	5,767[3]
Percentage on Value	4.31%	5.78%	0%
Average 1914-1917			
Defendants' Valuation	$11,693,557	$8,600,505	$3,093,052
Average Net Income	580,913[3]	382,485[3]	198,428[3]
Percentage on Value	5.00%	4.26%	6.42%
Average Net Inc. after deducting loss	391,299[3]	382,485[3]	8,814[3]
Percentage on Value	3.34%	4.26%	.28%

1 (R. p. 1147)
2 (R. p. 86)
3 Difference bet. 1 & 2
4 (R. p. 1191)
5 (R. p. 1192)
6 (R. p. 1193)
7 (R. p. 1194)
8 (R. p. 1195)
9 (R. Vol. VII Ex. 202 p. 11)
10 (R. Vol. VII Ex. 203 p. 11)
11 (R. Vol. VII Ex. 204 p. 13)
12 (R. Vol. VII Ex. 205 p. 9)

1914	Defendants Total Mich.	Freight	Passenger
Defendants' Valuation	$11,674,752[1]	$8,593,129[3]	$3,081,623[3]
Actual Net Income	425,741[4]	48,401[4]	394,442[4]
Per Cent on Value	3.64%	.56%	12.80%
Estimated Loss	196,046[5]		196,046[5]
Net Inc. after deducting loss	229,695	48,401	198,396
Per Cent. on Value	2.65%	.56%	6.44%
1915			
Defendants' Valuation	11,697,474[1]	8,370,131[3]	3,327,343[3]
Actual Net Income	448,437[6]	198,437[6]	266,117[6]
Per Cent. on Value	3.84%	2.37%	8.00%
Estimated Loss	167,535[7]		167,535[7]
Net Inc. after deducting loss	280,902	198,437	98,582
Per Cent. on Value	2.40%	2.37%	2.96%
1916			
Defendants' Valuation	11,526,134[1]	8,452,464[3]	3,073,670[3]
Actual Net Income	778,109[8]	483,195[8]	311,047[8]
Per Cent. on Value	6.76%	5.71%	10.12%
Estimated Loss	176,641[9]		176,641[9]
Net Inc. after deducting loss	601,468	483,195	134,406
Per Cent. on Value	5.22%	5.71%	4.37%
1917			
Defendants' Valuation	11,875,868[2]	8,986,220[3]	2,889,648[3]
Actual Net Income	781,350[10]	434,019[10]	364,997[10]
Per Cent. on Value	6.56%	4.85%	12.62%
Estimated Loss	218,234[11]		218,234[11]
Net Inc. after deducting loss	563,126	434,919	146,763
Per Cent. on Value	4.73%	4.85%	5.05%
Average 1914-1917			
Defendants' Valuation	$11,693,557[1]	$8,600,505[3]	$3,093,052[3]
Average Net Income	608,409	291,238	334,150
Per Cent. on Value	5.20%	3.39%	10.81%
Average Net Inc. after deducting loss	418,797	291,338	144,537
Per Cent. on Value	3.59%	3.39%	4.67%

1 (R. p. 1147)
2 (R. p. 86)
3 Dif. between 1 & 2
4 (R. Vol. V p. 160)
5 (R. Vol. VII Ex. 202 p. 11)
6 (R. Vol. V p. 330)
7 (R. Vol. VII Ex. 203 p. 11)
8 (R. Vol. V p. 518)
9 (R. Vol. VII Ex. 204 p. 13)
10 (R. Vol. V p. 712)
11 (R. Vol. VII Ex. 205 p. 19)

Applying our view from perspective, let us consider what railroad statistics ordinarily show the comparative earnings to be from the passenger and from the freight sides of the business. Such statistics show that the passenger and the freight services, using the property in common, as they do, each service charging as high rates as the mangers of the railroads are able to get out of the traffic, are ordinarily carried on with about the same degree of profit, and if there is any difference in the profit earned it is usually in favor of the freight service. It has been found by the Interstate Commerce Commission in many cases, particularly in the so-called "Five Per Cent Case" (31 I. C. C. Rep. 351) that the passenger business on most railroads is less profitable than the freight business.

Examining the plaintiff's figures, as shown in the above table, it is seen that, based on defendants' claimed property values, for the average of the four years 1914-1917, the plaintiff's net income from all its operations in Michigan was 5%; from its freight operations 4.26%; from its passenger operations 6.42%. These are the figures for the actual operations under the old rate and do not take into consideration the estimated loss. If we figure the estimated loss, we find that the plaintiff would have received from its total business in Michigan only 3.34%; from its freight business 4.26%; and from its passenger business .28%. Therefore the results shown by plaintiff's method of divisions do not appear to be at all disproportionate as regards the net income from passenger and from freight. In fact, they indicate that the plaintiff in its divisions has been more than fair to the passenger, in showing a larger proportionate return from passenger than from freight.

In studying the results, as shown by defendants' computations, we find that, on an average for the four years, the plaintiff earned a net return of only 5.20% from its

total business in Michigan; of only 3.39% from its freight business; but of 10.81% from its passenger business. These results demonstrate, if nothing else, that the returns from the passenger and from the freight business, as found by the defendants, are in very great disproportion, as compared with the railroad statistics generally. Is it not a fair deduction from this circumstance that the criticisms which we have made of defendants' methods of division may be proper criticisms?

We cannot make any proper comparison of the figures of the plaintiff with those of the defendants, as applied to the return from the intrastate passenger business alone, for the reason that before the defendants divide their passenger expenses between intrastate and interstate they weave in their theories of separate apportionments to mail and express and sleepers and diners, and divide between intrastate and interstate only the small balance which they denominate "passenger and baggage." However, by applying to defendants' figures for total passenger income in each of the years the same ratio of proportion which they use for dividing their "passenger and baggage" portion between intrastate and interstate, we find the following results, indicating that the rate of return from the intrastate passenger business, as determined by the application of defendants' methods and figures, is not materially different from the rate of return which they find is received from the passenger business as a whole. In this table we use the passenger net income as determined by defendants after we have deducted the estimated loss, the figures in the first column of this table being the same as those in the last column of the last preceding table.

1914	Total Passenger	Intrastate	Interstate
Defendants' Valuation	$3,081,623	$1,993,453	$1,088,095
Net Income (loss deducted)	198,396	144,739	53,657
Rate of Return	6.44%	7.28%	4.93%
1915			
Defendants' Valuation	3,327,343	2,338,789	988,554
Net Income (loss deducted)	98,582	72,830	25,752
Rate of Return	2.96%	3.24%	2.60%
1916			
Defendants' Valuation	3,073,670	2,176,466	897,204
Net Income (loss deducted)	134,406	96,772	37,634
Rate of Return	4.37%	4.45%	4.18%
1917			
Defendants' Valuation	2,889,648	2,042,114	847,524
Net Income (loss deducted)	146,763	105,669	41,094
Rate of Return	5.05%	5.17%	4.85%
Average 1914-1917			
Defendants' Valuation	3,093,052	2,137,705	955,347
Net Income (loss deducted)	144,537	105,003	39,534
Rate of Return	4.67%	4.90%	4.14%

In order to show how small a return plaintiff would have received from its intrastate passenger business, even by the application of defendants' own methods of division of property and expenses, we present still another table. The figures as to total passenger value have been taken from the defendants' claim as made in the Record, as shown in the foot-note to the table. The division of the value between intrastate and interstate has been made on the proportion of the intrastate and interstate passenger miles in each year, being the basis used by both parties for such division. The remaining figures are taken from the last table preceding.

NET RETURN FROM INTRASTATE PASSENGER BUSINESS, APPLYING DEFENDANTS' FIGURES OF NET INCOME TO DEFENDANTS' CLAIMED PASSENGER PROPERTY VALUES.

1914	Total Passenger	Intrastate	Interstate
Defendants' Valuation	$2,566,054[1]	$1,667,935 64.69%[4]	$898,119 35.31%[5]
Net Income (loss deducted)	198,396	144,739	53,657
Rate of Return	7.63%	8.68%	5.96%
1915			
Defendants' Valuation	2,598,758[2]	1,827,541 70.29%[4]	771,217 29.71%[5]
Net Income (loss deducted)	98,582	72,830	25,752
Rate of Return	3.79%	3.98%	3.34%
1916			
Defendants' Valuation	2,619,894[3]	1,855,222 70.81%[4]	764,672 29.19%[5]
Net Income (loss deducted)	134,406	96,772	37,634
Rate of Return	5.13%	5.23%	4.95%
1917			
Defendants' Valuation	2,644,203[3]	1,868,394 70.67%[4]	775,809 29.33%[5]
Net Income (loss deducted)	146,763	105,669	41,094
Rate of Return	5.55%	5.65%	5.33%
Average 1914-1917			
Defendants' Valuation	2,607,227	1,804,773	802,454
Net Income (loss deducted)	144,537	105,003	39,534
Rate of Return	5.56%	5.82%	4.94%

1 (R. p. 1147)
2 (R. Vol. VII Ex. 202 p. 6)
3 (R. Vol. VII Ex. 203 p. 7)
4 (R. Vol. VII Ex. 204 p. 8)
5 (R. Vol. VII Ex. 205 p. 8)

From the above table we can see that even assuming to be correct the defendants' claimed values of property (notwithstanding such claim is $4,500,000 less than the values claimed by plaintiff, $2,400,000 less than the values found by the Master, and $1,250,000 less than the values found by defendants' own valuation engineer, Mr. Hansell); assuming the correctness of defendants' method of division of common property between passenger and freight by their "Time Ratio" and "Gross Ton Mile Ratio," although such division assigns to passenger less

than 21% of all the railroad property; assuming the correctness of the ratios by which, out of the total maintenance of way expenses of the plaintiff, less than 20% is assigned to passenger, and out of the total station expenses, less than 13% is assigned to passenger; and assuming the correctness of the theory by which nearly $20,000 is for each year arbitrarily taken out of the passenger operating expenses, as the expense of operating the trains while on the tracks of the Mineral Range Railroad; the plaintiff's net return from either its total passenger business in Michigan or its intrastate passenger business in Michigan, would not, for the average of the four years 1914-1917, have been as much as 6%. The only one of the four years when it would have exceeded 6% was the year 1914, which, as appears by the testimony, was an abnormal year for passenger earnings on account of the miners' strike in the copper country (R. p. 1041). It also appeared in the testimony and was found by the trial judge (R. p. 74) that the estimated loss in that year would have been much greater than was actually computed.

The only contention of defendants (considering only such contentions as were carried by them into figures) which is not conceded in making up the above table is defendants' contention that separate assignments of expenses should be made for mail and express and sleepers and diners. It therefore became a matter of necessity for defendants, if they must defeat plaintiff in this action, to invent and maintain such a theory as the creation of a large loss in the sleeper and diner operations.

Assuming the sleeper and diner contention to be untenable, the plaintiff was entitled to a decree, even on defendants' own figures.

Looking now at the results arrived at by the trial judge, who, as before stated, declined to adopt the methods of either of the parties for dividing common property or common expenses of maintenance of way, but adopted

methods much nearer those of the defendants than those of the plaintiff, we find again how small a return plaintiff has been receiving from its passenger business. These results are shown in the Record in Vol. I, pages 86-7, and we retabulate them here.

1912	Total	Intra.	Inter.
Value of Passenger Property	$2,882,375	$1,834,055	$1,048,320
Net Income under Two-cent Rate	100,875	78,609	22,266
Rate of Return	3.500%	4.286%	2.124%
1913			
Value of Passenger Property	$2,793,523	$1,831,992	$ 961,531
Net Income under Two-cent Rate	72,892	55,339	17,553
Rate of Return	2.61%	3.02%	1.83%
1914			
Value of Passenger Property	$3,081,623	$1,993,453	$1,088,095
Net Income under Two-cent Rate	91,191	61,808	29,383
Rate of Return	2.96%	3.10%	2.70%
1915			
Value of Passenger Property	$3,327,343	$2,338,789	$ 988,554
Net Income under Two-cent Rate	Loss 8,007	Loss 5,527	Loss 2,480
Rate of Return	0.0%	0.0%	0.0%
1916			
Value of Passenger Property	$3,073,670	$2,176,466	$ 897,204
Net Income under Two-cent Rate	42,219	25,832	16,387
Rate of Return	1.37%	1.19%	1.83%
1917			
Value of Passenger Property	$2,889,648	$2,042,114	$ 847,534
Net Income under Two-cent Rate	37,957	20,023	17,934
Rate of Return	1.31%	.98%	2.12%
AVERAGES FOR SIX YEARS, 1912 TO 1917.			
Value of Passenger Property	$3,009,685	$2,037,812	$ 971,873
Net Income under Two-cent Rate	56,188	39,347	16,841
Rate of Return	1.87%	1.93%	1.73%
AVERAGES FOR FOUR YEARS, 1914 TO 1917.			
Value of Passenger Property	$3,093,052	$2,137,705	$ 955,347
Net Income under Two-cent Rate	40,840	25,534	15,306
Rate of Return	1.32%	1.20%	1.60%

Even after having accepted without question the defendants' claimed value of the property and after having used for the division of common property and common expenses a ratio which was much more favorable to the defendants than to the plaintiff, the Trial Judge finds that for the six years, 1912-1917 inclusive, the average annual net income which plaintiff would, under the prescribed rate, have received from its total passenger business in Michigan was only 1.87%, and from its intrastate passenger business in Michigan only 1.93%; the average annual return for the period 1914-1917 being 1.32% for the total passenger and 1.20% for the intrastate passenger.

Looking at these three tables of final results of operation, as computed by the plaintiff, by the defendants and by the Court, is it conceivable that the trial judge could have arrived at any different conclusion than that expressed in the final words of his opinion:

> "These figures demonstrate conclusively that, upon any reasonable hypothesis, during the last six years, and particularly during the most important period of the last four years, plaintiff would not have received, under a two cent rate, an adequate return from its intrastate passenger business. This conclusion accords with and is confirmed by many known facts. The passenger travel upon this railroad is comparatively light and very much less than that upon roads of the same class traversing sparsely settled portions of the lower Peninsula of Michigan Climatic conditions are extremely unfavorable. No large cities are served, either along the line of road or at terminals. Distances between even small centers of population are great. Agricultural development is small. The situation and conditions shown by this record are quite similar to those of the Minneapolis & St. Louis Railroad Company, described

in the Minnesota Rate Cases, where the Supreme Court, notwithstanding erroneous methods of computation and apportionment, declared the statutory rate to be confiscatory. In the Arkansas Rate Cases, where the rate of return was little, if any, larger than here, the same Court sustained the contentions of the railroad company. It is settled by experience and by authority that the cost per mile of transportation of the intrastate passenger is more than that of the interstate, and yet, in the Western Passenger Fares Case, the Interstate Commerce Commission granted to the plaintiff, and to the other railroads much more favorably situated, the right to charge two and four-tenths cents per mile for interstate transportation. Plaintiff has never paid a dividend upon its stock and, from its income, has never been able to pay more than a small portion of its interest upon its bonded indebtedness. There is no charge of mismanagement in recent years. Operating expenses have steadily increased and are likely to continue to increase for some time to come.

Plaintiff is entitled to a decree in its favor."

Respectfully submitted,

WILLIAM D. MCHUGH,
JOHN E. TRACY,
Of Counsel for Duluth, South Shore & Atlantic Railway Company, Appellee.

APPENDIX

AN ACT to amend section nine of act number one hundred ninety-eight of the laws of eighteen hundred seventy-three entitled "An Act to revise the laws providing for the incorporation of the railroad, bridge and tunnel companies and to regulate the running and management and to fix the duties and liabilities of all railroad, bridge, tunnel and other corporations owning or operating any railroad, bridge, or tunnel within this State," as amended, said section being compiler's section six thousand two hundred thirty-four of the Compiled Laws of eighteen hundred ninety-seven.

The People of the State of Michigan enact:

Section 1. Section nine of act number one hundred ninety-eight of the laws of eighteen hundred seventy-three, entitled "An act to revise the laws providing for the incorporation of the railroad, bridge and tunnel companies and to regulate the running and management and to fix the duties and liabilities of all railroad, bridge, tunnel and other corporations owning or operating any railroad, bridge or tunnel within this State," as amended, said section being compiler's section six thousand two hundred thirty-four of the Compiled Laws of eighteen hundred ninety-seven, is hereby amended to read as follows:

Sec. 9. Every such corporation shall possess the general powers and be subject to the liabilities and restrictions following, that is to say:

* * * * * * *

Ninth. To regulate the time and manner in which passengers and property shall be transported, and the

tolls and compensation to be paid therefor; but such compensation for transporting any passenger and his or her ordinary baggage, not exceeding in weight one hundred fifty pounds, shall not exceed the following prices, viz: for a distance not exceeding five miles, three cents per mile; for all other distances for all companies the gross earnings of whose passenger trains, as reported to the Commissioner of Railroads for the year nineteen hundred six, equaled or exceeded the sum of one thousand two hundred dollars per mile for each mile of road operated by said company, on which regular passenger service is maintained, as hereinafter provided, two cents per mile, and for all companies whose earnings reported as aforesaid were less than one thousand two hundred dollars per mile of road operated by said company, three cents per mile; *Provided*, That in the future, whenever the earnings of any company doing business in this State, as reported to the railroad commission at the close of any year, shall increase so as to equal or exceed the sum of one thousand two hundred dollars per mile of road operated by said company, then in such case said company shall thereafter, upon the notification of the railroad commission, be required to only receive as compensation for the transportation of any passenger, his or her ordinary baggage, not exceeding in weight one hundred fifty pounds, a rate of only two cents per mile as hereinbefore provided: *Provided further*, That in computing the passenger earnings per mile of any company the earnings and mileage of all branch roads owned, leased, controlled or occupied or that may hereafter be owned, leased, controlled or occupied by such company, exclusive of all spurs and branches over which such company does not operate each way daily, except Sunday, at least one passenger train, or mixed train having at least two passenger coaches or one passenger coach and baggage car, shall

be included in the computation, and the rate of fare shall be the same on all lines, owned, leased, controlled or occupied by such company: *Provided further*, That no company shall charge, demand or receive any greater compensation per mile for transportation of children of the age of twelve years or under than one-half the rate herein prescribed: *Provided further*, That any railroad company may charge a minimum fare of five cents for each passenger transported over its road, whenever cars are propelled or moved by motive power other than steam: *Provided further*, That any railroad company which shall, within thirty days after notification by the railroad commission fail to comply with the provisions of subdivision nine of this section, shall immediately after such failure become liable to the people of the State of Michigan in a penalty of five hundred dollars per day for each and every secular day during the pendency of such failure, which said penalty shall be collected in an action to be brought by the railroad commission in any court of competent jurisdiction within this State, and which said penalty when collected shall be paid into the State treasury and credited to the primary school fund. The penalty in this section mentioned shall be supplemental to and shall not be deemed to supersede any extraordinary remedy by mandamus or otherwise authorized by law, to be instituted by the State, the railroad commission or any State officer or board to compel compliance with section one of this act. The provisions of this section shall apply to all railroad companies operating lines of railroad in this State, whether such companies are organized under the general railroad law or under any special charter from the State legislature.

Approved May 2, 1911.

SUBJECT INDEX.

	PAGE
Method of Valuation	3
Schedule 1. Right of Way and Station Grounds	8
Lands with Special Value on Account of Their Adaptation for Railroad Purposes	9
Trackage Rights in Streets	11
Land Values in Mineral District	14
Schedule 3. Grading	17
Clearing and Grubbing	19
Schedule 6. Ties	21
Schedule 10. Ballast	21
Schedule 11. Track Laying and Surfacing	23
Schedule 34. Ferries and Steamships	23
Schedule 35. Engineering on Equipment	24
Schedule 37. Contingencies	37
Schedule 38. Legal Expenses during Construction	45
Schedule 39. Organization, Administration and General Expenses during Construction	45
Schedule 40. Interest and Taxes during Construction	49
Schedule 43. Working Capital	50
Appreciation	51
Division of Property between Michigan and Wisconsin	58
Effect upon the Valuation of the Increase in Unit Prices in 1917	59

CITATIONS.

	PAGE
City of Owensboro *vs.* Cumberland Telephone Co., 230 U. S. 58	12
Cumberland T. & T. Co. *vs.* Louisville, 187 Fed. 646	50
Cunningham *vs.* Water & Light Co., 5 Wis. R. C. Rep. 306	50
G. R. & I. Ry. Co. *vs.* Heisel, 38 Mich. 62	12
Lincoln Gas & Electric Co. *vs.* Lincoln, 182 Fed. 926	50
M. & S. E. Ry. Co. *vs.* Longyear, 133 Mich. 94	12
Michigan Statutes, Compiled Laws of 1897, Sec. 6234	11
Minnesota Rate Cases, 230 U. S. 352	8, 10, 56
Montana Co. *vs.* Warren, 137 U. S. 348	17
Reidinger *vs.* M. & W. Ry. Co. et al., 62 Mich. 29	12
U. S. *vs.* Chandler-Dunbar Water Power Co., 229 U. S. 53	10

IN THE

Supreme Court of the United States,

OCTOBER TERM, 1918.

ALEX. J. GROESBECK, CASSIUS S. GLASGOW, CHARLES S. CUNNINGHAM and ADDISON L. KEISER,
Defendants and Appellants,

vs.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY,
Plaintiff and Appellee.

BRIEF FOR PLAINTIFF AND APPELLEE ON THE QUESTIONS OF VALUATION.

The trial court, in deciding this case, did not find it necessary to investigate and determine the real value of plaintiff's property which was devoted to the public use. It was apparent to him that the return which the statute would yield to the plaintiff company would be so small that, even accepting the valuation of the property as claimed by the defendants, the return would be inadequate and confiscatory, and upon this ground, he decided the case.

We believe that this court will reach the conclusion announced by the trial court and will, therefore, find it unnecessary to go into the question as to the real, actual value of plaintiff's property, and in our principal brief we have presented the case upon that theory.

However, should this court reach a different conclusion, then it will be necessary to determine the real, actual value of the plaintiff's railroad property, and this brief upon valuation is presented as an aid to the court in such an investigation.

As was stated in our original brief, this case was tried and submitted to a master and a decision was reached by him. Owing to the fact that by the time the master's report was filed, years had elapsed and the testimony before the master therefore related to conditions which were more than three years old at the time of the hearing before the court, the master's report was deemed insufficient for a decision, and testimony was taken covering results of operation of the plaintiff company for the four years intervening between the closing of the testimony before the master and the hearing before the court. The testimony before the court covered, among other things, the valuation for those intervening years. As to land values, it was stipulated on the hearing before the court that the witnesses for the plaintiff who had testified on that subject before the master, should be considered as having testified before the court that the land values during the intervening years, were no less than the values to which they had testified before the master, and that the witnesses for the defendant who testified before the master as to land values, should be considered as having testified before the court that the land values during the intervening years were no greater than they had testified to before the master.

As was said, the trial court did not deem it necessary to refer to the question of the value of plaintiff's railroad property "except in a most general way." (Opinion of the Court, R. Vol. I, p. 81.)

The court further said (Id. p. 82), "the estimates and appraisals prepared and presented by defendant are in many respects much too low."

He further said (Id., p. 83), "if it were necessary in

the decision of this case to determine accurately the value of plaintiff's property used in its railroad business, defendants' claimed values would have to be increased more than $1,000,000."

In view of the fact that the trial court found it unnecessary to determine "accurately" the value of plaintiff's property used in its railroad business, and in view of the further fact that the master is the only person who has actually considered and decided this question in this case, and in view of the further fact that the master's report is in the record herein, comprising Volume III, we shall refer to his report in this argument, although as was said, the report did not constitute the basis of the decree of the trial court.

METHOD OF VALUATION.

In order to find the valuation of the plaintiff's property in Michigan, the plaintiff caused an appraisal thereof to be made by Mr. Henry E. Riggs, an eminent engineer who is now Professor of Civil Engineering in the University of Michigan. His valuation was made as of June 30, 1911, and he used for his plan for listing the property, the classification at that time prescribed by the Interstate Commerce Commission for the keeping of construction accounts. This involved the preparation of forty-three separate schedules, separating in convenient form the various classes of property in use by plaintiff. Later the defendants caused an appraisal of the plaintiff's property in Michigan to be made by Mr. Charles Hansel, who followed the same plan adopted by Mr. Riggs, making his valuation as of October 1, 1912. Later Mr. Riggs made another appraisal of the property, bringing it down to date of June 30, 1913, which was the date fixed by the master as the date on which he based his values. Each engineer, in making his valuation, based it on the theory of cost of reproduction less depreciation, giving for each item in the

several schedules the engineer's estimate of the cost of reproduction, and the percentage of condition in which the property was on the date examined as compared with the condition if it were new. This percentage of condition, applied to the cost of reproduction, gave the "present value." A comparison of these appraisals comprises Volume IV of the Record.

We find, upon an examination of such volume of the record, that through some error in binding, the sheet has been omitted which gives the valuations of each of the engineers in comparative summary form. We are, therefore, attaching such summary sheet as an appendix to this brief.

It will be noted from this summary sheet that the valuations made by these two engineers were not very far apart, if we except land values, as to which both valued on wrong theories, all their valuations on land values being subsequently abandoned as a basis for the claims of either of the parties. Disregarding land values, the valuation of each of the engineers on the total of the remaining schedules was as follows: Hansel (1912) $11,260,859; Riggs (1913), $14,602,343. In addition to the differences due to the later date of the Riggs 1913 appraisal, the differences between the engineers were in some cases as to quantities, in other cases as to unit prices, and in other cases as to theories. A large amount of testimony was introduced in support of, and in opposition to, the valuations as found by these two engineers, and a great many issues of fact were presented which were fought out at length and finally passed upon and decided by the Master, resulting in his finding the total value of plaintiff's railroad property in Michigan to be $13,901,938., as against a claimed value on the part of the plaintiff of $17,044,081, and on the part of defendants' engineer, Mr. Hansel, of $12,727,646., although defendants' counsel now claim the value to be only $11,457,169.

When the hearing before the court was arranged for, the trial judge requested that the valuation be brought down to date of June 30, 1917, and both parties undertook to comply with this request. The plaintiff proceeded in the following manner: It sent its engineers over the road with the detailed schedules of property, as found by the Master to be in railroad use on June 30, 1913, and with instructions to bring the quantities of the items in the different schedules as found by the Master, down to date of June 30, 1917, by deductions for property retired and by the addition of new property acquired in the four years interim; and by making, where necessary, adjustments for additional depreciation. The plaintiff then presented two alternative sets of claims as the values for 1917.

The theory upon which one claim was based was to take the quantities of property in the different schedules as found by the Master, corrected by deductions for property retired and additions for new property acquired, and to obtain the value thereof, not by applying the unit prices used by the Master in 1913, but rather unit prices based upon the average prices of such items of property (rails, ties, equipment, etc.) during the fiscal year ending June 30, 1917, the prices being then on a considerably higher scale than in 1913. In support of this theory the plaintiff introduced a considerable amount of testimony as to the higher prices and their probable permanence. The total value as determined under this theory was $18,070,158., and the detail thereof is shown in plaintiff's exhibit 201 (Vol. VII. of the Record).

The alternative method of valuation adopted by the plaintiff was to simply bring the Master's valuation down to date by making the necessary adjustments for retirements and additions, putting in all additions either at actual cost or at the Master's unit prices. This valuation was made for each of the several dates of June 30,

1914, June 30, 1915, and June 30, 1916, as appears in plaintiff's exhibits 201-A, 201-B, and 201-C, (R. Vol. II., pp. 1190, et seq.). The similar computations for 1917 can be easily made from the tables in exhibit 201 (R. Vol. VII.).

The values for these years, as thus found, were 1914, $14,240,888.; 1915, $14,031,362.; 1916, $14,236,222.

The method adopted by the defendants to ascertain the valuation for the years succeeding 1913, was to take as their basis their original claims before the Master (ignoring his findings, except that in the greater number of instances the Master had adopted the defendants' claim as his finding) and to attempt to bring the same down to date by adding or deducting the net amount shown in the plaintiff's account for "Additions and Betterments" in each year in its report to the State Railroad Commission. It was shown, however, on the hearing before the court, that this method was based upon a misunderstanding by defendants' counsel of the real nature of the "Additions and Betterments" account, which is an account set up and kept in accordance with the regulations of the Interstate Commerce Commission and as to the proper construction of which there can be no conflict. As shown by the classifications of accounts of the Interstate Commerce Commission, which are in evidence (plaintiff's exhibit 216) and explained by the testimony of plaintiff's comptroller, Mr. Delf, (R. p. 1052) the account of "Additions and Betterments" or "Road" is not an account of property but of investment and does not take into consideration at all the question of depreciation. Property deducted from that account by reason of retirement is deducted at original cost new, (or at estimated cost new if the figures of original cost are not available) and property added is put into the account at cost new. For instance, a railroad company may have on its line a bridge which cost new $10,000., but which by deprecia-

tion, is in only 50% condition. The company replaces that bridge by a similar structure costing $10,000. The account of Additions and Betterments would be debited with the cost of the new bridge, $10,000., and would be credited with the investment in the old bridge, $10,000., making no net increase in the account. No account whatever is taken of the fact that the retired bridge had a much less value than its investment cost, and that the railroad now has a $10,000. bridge in 100% condition, instead of a $10,000. bridge in only 50% condition. It is therefore seen that defendants' method of bringing the valuation of 1913 down to date by use of the "Additions and Betterments" account in no way reflects the real change in the values of property between the two dates. Such a $10,000. bridge in 50% condition would have appeared in the Master's valuation as of the value of $5,000. Under the plaintiff's method $5,000. would have been deducted from the Master's valuation for property retired and $10,000. added for new property acquired, making a net addition of $5,000.

Defendants' claimed values for 1914, 1915, 1916 and 1917 are shown in their exhibits 332, 339, 343, 344, 345 and 346 (Not printed). The totals are as follows: 1914, $11,674,752; 1915, $11,697,474; 1916, $11,526,134; 1917, $11,875,868.

In addition to bringing their former valuation down to date, defendants, on the hearing before the court, introduced additional testimony as to the condition of plaintiff's road in 1917, and as to quantities and unit prices of various items of property.

We shall now present briefly our argument on those valuation schedules as to which the parties materially differ:

SCHEDULE I.

Right of Way and Station Grounds.

There was more testimony taken on the value of the lands of the plaintiff than on any other valuation schedule, notwithstanding that there was no testimony on this subject at the hearing before the court, this issue being presented to the court on the stipulation of the parties above referred to as to the use of the testimony taken before the Master. The witnesses, in general, testified to the lands as the same are described in plaintiff's Exhibit 1-C, which was a new inventory of lands prepared to correct errors in previous inventories, and at the same time, to give the allocations of the lands to the different services (1) passenger, (2) freight and (3) common passenger and freight, as the same had been agreed upon between the parties. The method of valuation of lands adopted by both parties was that laid down by this court in the Minnesota Rate Cases (230 U. S. 352) in that the witnesses were asked to base their values upon the value of similar lands adjoining, and if there were not similar lands adjoining, nearby similar lands. Each side furnished to the Master a schedule showing the value claimed by it for each parcel of land to be valued, with references to the testimony upon which they rely, and the Master made a deep study of the testimony and a detailed valuation of every parcel, as shown in his report (R. Vol. III., pp. 84-112).

The totals of land values, as found by the Master and as assigned by him to the different services, is as follows:

Passenger	*Freight*	*Common*	*Total*
$142,679	$1,025,228	$612,332	$1,780,239

It will be noted that of his total valuation of $1,780,239, considerably over half thereof is assigned by the Master to exclusive freight (comprising, to a large extent, the

freight spurs in the mining district). The value assigned to common (being the main line right of way) is only at the rate of about $1,410 a mile, or $117 an acre, certainly not an exorbitant price when we realize that this includes the right of way in all the cities and villages through which the road runs.

There were certain parcels used by plaintiff with reference to which there was a controversy between the parties as to the proper method of valuation and certain other parcels where they differed as to whether the land was properly to be included in plaintiff's inventory. Some discussion of these controversies seems to be desirable.

(1) *Lands with special value on account of their adaptation for railroad purposes.*

There were two such items of property. One was the so-called South Yard of the plaintiff in the City of Marquette, where it was found that the land was peculiarly adapted for the purposes of a railroad yard and that to construct a yard in any other place in that city would not only involve a greater cost of construction, but also of operation, and that the cost of such a substitute yard could be proved and was proved in dollars and cents.

The other item was the right of way in Houghton County from the Pilgrim River to and including the Houghton Terminal, where the railroad occupies a narrow shelf of land along Portage Lake. As to this tract, plaintiff proved that any substitute line, if this were not available, would be much more expensive and the cost of the next most available route was set forth in dollars and cents.

As to the principle that the plaintiff may have the value of its lands that by reason of their special adaptation for railway purposes have a market value beyond the value of ordinary lands in the same vicinity, there can be no question under the decisions of this Court.

It was so expressly held in the Minnesota rate cases, 230 U. S. page 451, citing U. S. *vs.* Chandler-Dunbar W. P. Co., 229 U. S. 53, and other cases therein cited.

The proofs as to the special values in these two instances were undisputed and the special values claimed were moderate in amount. We therefore think the Master was abundantly justified in his valuation of these lands. (Master's Report. R. Vol. III, pp. 84-86.)

(2) *Lands with water rights appurtenant.*

This question involves lands on the water front at St. Ignace, Marquette, and Houghton, respectively, and presented certain issues of fact which were passed upon by the Master on pages 86 to 91 of his report. (R. Vol. III, pp. 86-91).

It is the claim of the plaintiff that the lands on the water front at St. Ignace were all in railroad use, including their water rights, because it was necessary to own the water front on each side of all docks in order to preserve the use of the water on each side of the docks from encroachment by other docks built out from adjoining lands.

There was practically the same situation at Marquette, but the controversy there is now of small importance because the property in controversy is almost all in exclusive freight use.

At Houghton, the property affected was all common passenger and freight. There were no docks then in actual use, but it was the claim of the plaintiff that the water rights were essential to be held for the same use which had been made of them in the past and might be necessary at any time, and we believe the testimony fully justified the Master's decision in plaintiff's favor in this regard.

With reference to all lands on the water front, it was the claim of the plaintiff that if the lands were necessary for railroad use and were wisely selected as affording the most economical place to build a railroad, it was entitled

to the entire value of the land, as water rights are merely appurtenant to the land. This claim was applicable particularly at Houghton, and the testimony was uncontroverted not only that the plaintiff's railroad was economically located, but that it was the only place where it could be located. In addition, the testimony disclosed the fact that it was impossible to use the water rights for other than railroad purposes without interfering with the railroad use of the lands.

(5) *Trackage rights in streets.*

The plaintiff caused to be valued by witnesses two rights of way in streets, one in Lake Street, in the City of Marquette, and one in Canda Street, in the City of Ishpeming. In each instance, the use of the part of the street valued was exclusively in the railroad company, and the easement was, in each instance, perpetual. With reference to the right in Lake Street, the question of perpetuity was in dispute before the Master because the resolution of the Council of the City of Marquette granting the easement was permissive and fixed no time limit. We believe that the Master was of the opinion that it was a revocable right. In this he was clearly in error, although not at all in fault for the error, as the question was not properly argued by the plaintiff nor the conclusive decision of this Court called to his attention.

Paragraph Fifth of Section 9 of the General Railroad Laws of the State of Michigan (S. 6234, Compiled Laws of 1897), covers the terms upon which railroads may obtain the right to cross or occupy public streets. So far as we deem it material, it reads as follows:

> "And in case of the construction of such road upon any public street, lane, alley or highway, the same shall be on such terms and conditions as shall be agreed upon between the railroad company and the common council of any city, of the village board

of any village, or the commissioner of highways of any township, in which the same may be; but such railway shall not be constructed upon any public street, lane, alley, highway or private way, until damages and compensation be made by the railroad company therefor to the owner or owners of property adjoining such street, lane, alley, highway or private way, and opposite where such railroad is to be constructed, either by agreement between the railroad company and each owner or owners, or ascertained as herein prescribed for obtaining property or franchises for the purpose of its incorporation," etc.

It will be seen that while the power to acquire the use of streets comes to the plaintiff from the state in the same way and in the same sense that the power to condemn property and the power to be a corporation comes from the state, the actual right to use a street is obtained only by actual bargain, not only with the municipality, but with the owners of the property abutting on the street.

Reidinger *v.* M. & W. Ry. & D. M. & M. Ry., 62 Mich., 29.
G. R. & I. Ry. Co. *vs.* Heisel, 38 Mich., 62.
M. & S. E. Ry. Co. *vs.* Longyear, 133 Mich., 94.

The Reidinger case had to do with rights acquired by two of the railroads whose property now constitutes a part of the property of the plaintiff, and shows that, as a matter of fact, rights in the streets of Marquette were not obtained without compensation.

City of Owensboro vs. *Cumberland Telephone & Telegraph Company*, 230 *U. S.* 58 determines, beyond controversy, that the right given by the City was not temporary and not subject to revocation, except the power to revoke was expressly reserved, and in the instant case, it was not so reserved. With reference to a franchise not at all dif-

ferent in its nature from the one here under discussion, this Court said, (page 72):

> "When that grant was accepted and acted upon by the grantee, it became a contract between the city and the telephone company which could not be revoked or repealed unless the power to repeal was clearly and unmistakably reserved."

(Page 66)

> "If there be authority to make the grant and it contains no limitation or qualification as to duration, the plainest principles of justice and right demand that it shall not be cut down in the absence of some controlling principle of public policy."

It was also held in that case of the franchise right to use streets (Page 65) that "as a property right, it was assignable, taxable and alienable. Generally, it is an asset of great value to such utility companies, and a basis for credit."

Can it be possible that a property right of this kind is to be excluded from the value of a public utility corporation?

There is absolutely no evidence in the case that the City of Marquette has ever desired even to take this property from the complainant, and the evidence is conclusive that if it could be taken from it, plaintiff would be compelled to obtain adjoining property, not so well suited for its purposes and upon which a railroad could only be built at greater cost to replace the property it is using.

With reference to the use of Canda Street, not only was the right given in perpetuity, but the contract with the City of Ishpeming provided that before the railroad company

> "Shall grade for or lay any track upon the course as designated upon the map, it shall purchase and deed

to the city sufficient land along the north side of Canda Street at places where said course on said map at and near First Street, and also between Lake and Spruce street, approaches nearer to the north line of Canda Street than at the Main Street crossing, so that such land so purchased shall make said Canda Street north of said crossing throughout its entire length of uniform width, and same (as) at the Main Street crossing."

So it appears that there was a consideration passing from the railroad company to the City of Ishpeming for this right, and that, in addition to bargaining with the abutting owners, the plaintiff actually bought and paid for land which it conveyed to the City of Ishpeming in exchange for the land which it now uses, in exclusion of the public. For the Master's findings on these questions see R. Vol. III. pp. 91-94.

(4) *Land values in the Mineral District.*

The facts as to this dispute are very well set forth in the Master's report as follows: (R. Vol. III. pp. 94-100).

"Throughout the city limits of the City of Negaunee, and from thence through the City of Ishpeming, and for some distance beyond, the main lines of the complainant traverse a well-known and very valuable iron ore formation. Besides these main lines, the complainant owns branch lines which are used to reach mines in operation, and are useful and valuable for reaching any mines that may be discovered in the district. The rights of way for all the lines referred to are perpetual and exclusive, and carry with them the right to the permanent maintenance of the surface. Throughout the City of Negaunee the ore is a soft ore which is only economically mined by allowing the surface to cave, following the removal

of the ore, thus causing very considerable depressions in the surface. If a railroad lies over such an ore deposit and must be maintained, not only is it impossible to remove the ore which underlies the track, but it is impossible to remove the ore lying on either side of the track for very considerable distances, except at an expense which is practically prohibitive. There are now three main lines of railroad traversing the district. Of recent years it has been almost, if not quite, impossible to obtain the right of way across this district, except the carrier would agree to remove its track to another place if ore was discovered thereunder, which place it must itself acquire, and bear the expense of the removal of the railroad thereto.

"Shortly before this suit was commenced, ore was discovered under a track of the comp'ainant, and by agreement the Mining Company procured a new right of way and at its own expense, transferred the railroad thereto, the distance being some 2.75 miles. The entire expense of this transfer and the cost of acquirement of right of way was fully proved in the evidence. In addition to the evidence of the actual cost of this piece of right of way, there was opinion evidence as to the price at which the other right of way of complainant could be acquired through this mineral belt, considering the value of the lands over which they ran and the probability of iron existing therein. The chief witness relied upon was Mr. Belden, who had not only purchased the right of way at private sale, but had acquired by condemnation, right of way over similar lands in the district.

It is obvious that the right of way over this territory could not be valued by the value of nearby adjoining mineral lands, because the complainant does not own the mineral, but simply an easement with the right of support. It is equally obvious that this right of way is far more valuable than the adjoining lands valued simply as farming or garden property.

The claim of the complainant as to the nature of these lands and the character of the formation was

substantially confirmed by Mr. Allen, the State Geologist of Michigan. From his testimony it appears that while in some parts of this ore formation the geologist would be more apt to expect ore than in others, that a valuable deposit might be found anywhere.

The character of the ore in the City of Ishpeming is different from that in the City of Negaunee, in that it is a much harder ore, and by leaving pillars of ore the ground may be supported so as to maintain a track, but this can only be done at a loss of 30% of the entire ore body.

"The foregoing are undisputed facts and on them the question to be determined is, what value shall be given to those portions of right of way? Shall it be merely the surface value of the lands involved, or shall there be included also an allowance for the prospective mineral value?

The Master's finding on this point was as follows:

"Whatever elements of value are included in the market value of this right of way, as such value is shown by the evidence, must necessarily be included here. It is the judgment of the buying and selling public that determines the market value, and if that judgment is that the value of the property is enhanced, by its mineral prospects, it is, in fact, so enhanced, whether such judgment is wise or foolish—whether the prospects do or do not justify the estimate of any enhancement of value.

Under the rulings of the Minnesota rate decision, it seems clearly to be my duty to find the market value of this portion of right of way and include it in the valuation without undertaking to analyze and differentiate between the different elements of value that enter into that market value. This I have done, as specifically explained in the detail of land values in Marquette County, and the value of lands there fixed through the mineral belt, I believe to be fair and conservative."

We submit that the Master could not, under the evidence, fail to include in the value of these lands a value due to their permanency and right of support in a mineral district, and that the values as fixed by the Master were fair and conservative.

In this connection we call the attention of the Court to the case of *Montana Ry. Co.* vs. *Warren*, 137 *U. S.* 348.

SCHEDULE 3.

Grading.

The engineers divided the property in this schedule into five classes of items, viz:

(1) Grading proper, being the cost of moving materials used in the construction of the road, including earth work, solid rock and loose rock; (2) Clearing and grubbing; (3) Corduroy; (4) Rip-Rap; (5) Retaining Walls.

(1) *Grading.*

There was no disagreement between the parties as to the quantities of grading, nor as to the unit prices for both loose and solid rock. The principal disagreement between them was as to unit prices for earth work, Mr. Riggs having used a unit price of 30¢ a yard on all earth work and Mr. Hansel a different price for various materials,—his average price being 25.6¢.

The only basis suggested for Mr. Hansel's unit prices is his statement that they were according to his experience (R. p. 534) and he admitted that none of that experience had ever been in the Upper Peninsula of Michigan. He was not supported in his estimate of prices by the testimony of any other witness, except the defendants' witness French, who did not testify before the Master, but who testified before the court (R. p. 1131).

Mr. Riggs' prices were based on his own experience

in railroad construction; on the Michigan State appraisal of railroads of 1900 (known as the Cooley appraisal), which in that period of much cheaper costs used a unit price on earthwork of 25¢ a yard on all the railroads in the State, it being conceded that labor costs are higher for work in the upper peninsula than in the lower; and on prices for which contracts were let for construction of spurs to plaintiff's railroad in 1910, most of which contracts were at or above 30¢. (R. p. 174).

Mr. Riggs' price was corroborated by Mr. R. C. Young, Chief Engineer of the Lake Superior and Ishpeming Railway, who has had twenty or more years' of experience in railroad construction in that particular territory (R. pp. 262, 264); also by Mr. Loweth, Chief Engineer of the Chicago, Milwaukee & St. Paul Railway Company, which company owns and operates lines of railway in the upper peninsula of Michigan. The testimony of Mr. Loweth is interesting in that it shows that his estimate of grading costs was not one given for the purpose of this litigation, but that he was willing to act upon it as a fair basis for contract. In 1912 he testified before the Master, giving his opinion, from his experience, that 30¢ a yard was a conservative price for earthwork grading in that particular territory. (R. pp. 457-9). In 1917, he again appeared on the stand before the court and testified that early in 1915, his company purchased from the Chicago & Northwestern Railway Company a one-half interest in certain mining tracks in the upper peninsula of Michigan, on the basis of paying one-half of the estimated cost of the construction of those tracks, and that he and the chief engineer of the C. & N. W. R. R. Co. agreed that the prices at which grading should be figured should be 30¢ a yard on certain tracks and 33¢ a yard on others; and on his approval, his company paid for the tracks at those prices. (R. p. 1062). The Riggs price was also corroborated by Mr. Hogeland, Chief

Engineer of the Great Northern Railroad, who testified from his experience in letting grading contracts in Northern Minnesota, a country very similar in physical and climatic conditions to the upper peninsula of Michigan. Mr. Hogeland testified that although the average price of grading for the Great Northern System was only 19.3¢ a yard, the average price in Northern Minnesota was 36¢. (R. p. 475). The Riggs price was also corroborated by Mr. Payne, a witness called by the defendants on the hearing before the court, who had at one time been chief engineer of plaintiff's railroad, but had left plaintiff's employ in 1904, and who testified on cross examination that 30¢ a year would have been a fair price to pay for earth grading on plaintiff's railroad in the years 1913 to 1916. (R. p. 1103).

In view of the overwhelming weight of the evidence in favor of the Riggs unit price, the Master adopted it in his valuation of earthwork. (Master's Report, R. Vol. III., pp. 113-4).

(2) *Clearing and Grubbing.*

Both engineers agreed in their theory as to an allowance for clearing and grubbing, viz, that in computing the value of the grading schedule there should be allowed the cost of clearing the right of way occupied by the grade, basing their allowance for the amount of clearing and grubbing to be done upon the present condition of the adjoining lands. They differed somewhat as to the extent of clearing required, and as the amount allowed by each of them was at best only a rough estimate, based only upon their general inspection of the road as a whole, the complainant sent a man over the road for the express purpose of making an accurate estimate as to this, basing his estimate on an actual inspection of the land adjoining the right of way on each side. The carefulness of this esti-

mate was not questioned, and it was accepted by the Master. (Master's Report, R. Vol. III, pp. 117-24.)

There was a dispute between the engineers as to the amount of grubbing required—Riggs claiming that 40% of the cleared area would require grubbing and Hansel's percentage being 29.08. The Master adopted the Hansel figure.

It was the contention of the defendants that no allowance be made for the item of clearing and grubbing, for the reason that it is a part of and included in the land value of the right of way itself. The Master held, however, that here clearing and grubbing is not an item of land value, but of construction cost; that the chopping down of a tree, the removal of the same from the right of way, and the grubbing of the stump is as much of a construction cost as the removal of a stone or boulder, and such cost has no application or relation to land value except in the instances where the land in the right of way has to be valued according to the value of the cleared and grubbed land adjoining. In such cases no allowance for clearing and grubbing was claimed by the plaintiff or allowed by the Master. In the instances where there was no nearby cleared land and the valuation of the land in the right of way had to be based on nearby uncleared or nearby cut-over lands, he excluded all timber value from the lands, but allowed clearing and grubbing under this construction schedule.

The defendants' valuation was taken by the Master as to all remaining items in this schedule—Corduroy, Riprap and Retaining Walls. The Master's findings as to the values in this schedule were all sustained by the court (R. p. 83), as shown by the opinion of the trial judge.

The following table shows the total value of this schedule as claimed by the engineer of each of the parties and as found by the Master:

Riggs (*Plaintiff*)	*Hansel* (*Defendants*)	(*Master*)
$2,855,707	$2,419,763	$2,766,714

SCHEDULE 6.

Ties.

The engineers were not very far apart as to quantities and the Master accepted the lower quantities, being the Riggs figures. The engineers also agreed as to unit prices, but the Master found an error in that both of them had twice included an inspection charge, and he cut the unit price down from 40¢ to 39¢. He also adopted the Hansel percentage of condition of 55%, which was lower than that of Riggs. We do not think the defendants can sustain their claim of error in the court's finding on this schedule. (See Master's Report, R. Vol. III, pp. 126-7) and opinion of trial judge (R. p. 83).

The following table shows the total value of this schedule as claimed by each of the parties and as found by the Master:

Riggs (*Plaintiff*)	*Hansel* (*Defendants*)	(*Master*)
$342,725	$315,428	$286,462

SCHEDULE 10.

Ballast.

The engineers differed as to quantities, unit prices and percentage of condition. For each different kind of ballast the Master accepted the figures of the engineer whose figures were the lower. He did the same as to unit prices. The only error which could be claimed in his valuation of this schedule was in the fact that he failed to depreciate the ballast from its cost of reproduction as found by him. His reasons for not depreciating ballast are set

forth on pages 129 to 135 of his Report (R. Vol. III, pp. 129-136), and his conclusion is as follows:

> "I find that ballast wherever exposed to the action of the elements depreciates slightly from disintegration, but that the depreciation from this cause occurring in the ballast of a railway between the time of ballasting and that of reballasting is so slight as to be practically inappreciable; that the ballast that is placed in the bed of a railway gradually diminishes in quantity by the sinking of portions of it into the ground, and by other portions of it being carried away by the elements, in consequence of which new ballast is required to be added from time to time, but that this diminution in quantity does not diminish the value per cubic yard of the ballast which remains in the road; that the ballast now in the complainant's road has not suffered appreciable depreciation from either of the causes assigned, and that its present value is the amount that it would cost to reproduce it."

In other words, he found as a fact that each engineer, on an examination of the road, found there at that time the amount of ballast which he inventoried. Whatever other ballast there may have been which had blown away since it was put on, was not a question for the court to determine.

The following table shows the value claimed on the total of this schedule by the engineer of each of the parties, and the value found by the Master:

Riggs (*Plaintiff*)	*Hansel* (*Defendants*)	(*Master*)
$657,748	$560,480	$610,247

SCHEDULE 11.

Track Laying and Surfacing.

The defendants on this appeal have abandoned all their former claims as to this schedule except their claim that the items should be carried at less than 100% condition (R. p. 126).

Both Mr. Riggs and Mr. Hansel carried this schedule at 100% condition, on the ground that it was a labor item which did not depreciate, but the defendants contended that it should be depreciated with the average of the five preceding schedules. The Master answered this contention on pages 139 to 147 of his report (R. Vol. III). We concur in his views and are of the opinion that even if the court should conclude that there should be depreciation in this item, the Master has demonstrated that the method contended for by the defendants is not a sound one.

SCHEDULE 34.

Ferries and Steamships.

The property in this schedule consists of two car ferries, the value of which was agreed upon between the parties. The ferries are owned by the Mackinac Transportation Company, an independent corporation controlled by the Michigan Central, Grand Rapids & Indiana, and the plaintiff railroads by stock ownership. The Transportation Company does both a freight and passenger business. In its passenger business it deals with the public generally, and charges a rate, not regulated by statute, amounting to 7¢ per mile. In its freight business it deals with the owning Railroad Companies only, except for a small amount of local freight between St. Ignace and Mackinaw City. Each one of the owning roads shares in the expense of the operation of the boats in proportion to the revenue received by it from freight going over and beyond the Straits of Mackinac in either direction. The

passenger revenues of the Transportation Company are used to reduce those expenses, and the owning roads are regularly billed upon for their respective shares of the net expense. The operations of these boats do not come into plaintiff's books of account, except that those books contain charges for the portion of the expense which complainant is called upon to pay to the Transportation Company for doing plaintiff's freight business.

It was the claim of the plaintiff that one-third of the value of the boats should be included in the valuation as freight property. It was contended by the defendants that one-third of the passenger revenues of the Transportation Company were a part of the passenger revenues of the plaintiff and should be so treated, and that the property should be included as joint passenger and freight. Both parties argued these questions at considerable length. The Master held that the property of this separate corporation, which itself does a passenger business on its own rates, was not a part of the passenger property used by the plaintiff, and no part of its revenues were passenger revenues of the plaintiff. The subject is fully treated by the Master, and in this brief we are quite content to rest the questions involved upon the findings made by him. (See Master's Report, R. Vol. III, pp. 162-168.)

SCHEDULE 35.

Engineering on Equipment.

Both Mr. Riggs and Mr. Hansel, and all other witnesses who testified on the subject, agreed that to arrive at the true value of plaintiff's property an allowance for engineering on equipment must be made, because the price paid for the equipment does not include the cost to the railroad of preparing the specifications for the particular equipment needed, nor the cost to the railroad of the inspection thereof. All the witnesses agreed that an allow-

ance of 2% on the equipment schedules properly measures this cost. Riggs (R. pp. 147-8); Loweth (R. p. 164); Hansel (R. p. 543); Cooley (R. 690).

Notwithstanding this agreement of testimony, the defendants' counsel contended that nothing whatever should be allowed for this schedule. The Master found this element of value to exist to the amount testified to by the engineers, and we do not see how he could have arrived at any other conclusion. (Master's Report, R. Vol. III, pp. 169-70.)

SCHEDULE 37.

Contingencies.

The Master in his valuation allowed an item of $400,000 for contingencies; that amount being slightly less than the amount allowed for contingencies in the valuation of defendants' engineer, Mr. Hansel, and a little more than half the amount claimed by the plaintiff. The defendants claimed that nothing should be allowed for this item. The trial judge, moreover, expressed it as his opinion that "some of plaintiff's claims as to values must be wholly rejected. In any plan for the actual construction of a railroad and in the preliminary estimates of its costs, an allowance for unforeseen contingencies may be proper; but in determining whether a given rate is confiscatory, indulgence in speculation as to what may or may not happen cannot be permitted" (R. p. 82).

The conclusion that an allowance for contingencies in this case would be "indulgence in speculation," altogether ignores the large amount of testimony on that point taken in this case. This testimony was more complete and informative than in any other rate case which has been brought to our attention, and in view of the position taken by the court, we shall quote from this testimony somewhat at length:

Mr. Riggs testified (R. p. 188-190):

"The item of contingencies is one that is added in all cases of valuation, to cover those elements of cost of construction that are not disclosed by the inventory of the property, and those elements that are due to weather, strikes and other causes that go to increase the cost of construction or add to the unit prices that have been used in making up the appraisal estimate.

My percentage averages 7.9%. This item is, and has been for many years, customary in construction work, in the engineering profession. On ordinary construction work, involving all classes of road equipment and bridge work, percentages vary from 5% to 15%, and, more, averaging fully 10% on all items. Engineering practices vary as to exactly how this should be added; some prefer to add a percentage to each item, varying from 5% to 20%, and some prefer to add an average percentage to the entire estimate.

Where percentage is applied to each item, there should be a general smaller percentage applied to undertaking as a whole, to cover elements of cost not covered in specific items. Contingency item is to cover unforeseen things or errors in inventory, and includes casualties, personal injuries, and loss by fire, flood and cyclone. In a property in existence for a number of years, it is difficult to procure accurate inventories, especially of masonry and concrete, yardage of grading, and other elements that go to make the completed property. The percentage is added, on the assumption that the estimate is always under. In practically every estimate of this sort, the serious errors have been errors of omission.

It might be possible to over-estimate, but in all estimates based upon profile quantities, as this is, the almost absolute certainty is that the error is of undervaluation, rather than an over-estimate. The profile fails to show swamp land, where settlement has taken place and additional earth has been hauled in, or

earth for filling sink holes or swamps, or earth hauled in to widen embankments, or where cuts have been taken out by steam shovel work and material used elsewhere. My contingency percentage is lower than in all Cooley appraisals, where 10% was applied to all items, including the overhead charges.

In every appraisal of railroad properties, a percentage has been included for contingencies, the amount of which has not been uniform. I have had frequent opportunity to observe the propriety of the percentage by comparison with actual results of work for which I made estimates. It has been my practice to allow 10% for contingencies in all estimates for new work. I have never been employed on work where the element of contingency in some form did not enter into and affect the cost to such an extent as to wholly or largely justify the percentage used by me, of 10%.

In general, the problem of estimating reproduction cost is more difficult than estimating the cost of new construction of a standard property, as the estimate for the new property is based upon complete surveys and specifications, etc., and the contingencies should be limited to elements of unseen construction, such as clay soil, rock, hard pan, quick sand, swamps, sink holes and weather contingencies, and not upon the omission of things to be done, while in the case of an old property all these things enter in; the property has been built so many years that perfect history of construction cannot be secured, and many things are not found that were encountered in building the property.

In my opinion, a contingency allowance is proper and necessary; the amounts added are reasonable, and I believe that if it were possible to determine the exact history of this property, it would be found that all, or substantially all, of the amounts named for reproduction cost of contingencies has actually been incurred in the way of contingent expense."

"My attempt was to make as complete an inventory as time would permit, and furnish as accurate a valuation as it was possible to furnish at the expenditure of a reasonable amount of money."

"So far as the contingency element applies to the items of difficult construction, bad foundations, expense due to construction in the winter, or weather conditions, or delays to traffic on account of construction or high unit prices by reason of causes that are not now capable of determination, it still leaves a large element of contingencies, and I think that it is unquestionably true that it is fully as difficult, if not more difficult, to arrive at a correct inventory and an accurate estimate of existing property, that has been in existence for many years, than it is to make an estimate of the cost of several hundred miles of standard construction where surveys have been made.

Allowance for contingencies was intended to cover (a) error of inventory, (b) cost due to difficult construction, and (c) cost due to weather conditions, all of which are in South Shore in as large a measure as in property about to be built. I have never known a case where cost of construction did not run in excess of estimated cost as a whole, and I always allow liberally for contingencies. I have endeavored to eliminate all elements of contingencies from the detail of my schedule, except where, in earthwork, I used the Cooley figures as a basis, and there I have added percentages. I think the figures I have given for earthwork actually under quantities that would be disclosed by re-survey. On particular struct res, my experience has been that, when work was finished, some of my structures have underrun and some overrun the estimate 10%.

An engineer may make the most careful estimates on the actual physical construction and be substantially correct, and he may carry out that work, and often engineers do carry out work and get comfortably within their estimate of the cost of doing the physical, but other items entirely outside of their con-

trol come in on every job, to a greater or less extent; that must be classed as a contingency charge.

Other items of contingency would—extra expense due to (d) demurrage, (e) material yard charges, (f) strikes and labor troubles, (g) securing labor, and (h) change of plans."

"I fail to see where it can be said that there is any greater value to the public by reason of the fact that, in the course of railroad construction, strikes occur, or delays to material, or even damages by reason of storms or wash-outs; but, in the building of every property, expenses of those kinds and of similar nature are incurred, and the men who are putting the money into the property, to create the property, are compelled to furnish that money and invest it in the property, and it appears to be a properly chargeable expense incident to construction, and to be properly a part of the capital.

The strike and delay, involving demurrage charge and a dozen other items, are misfortunes that are incident to the building of railroads, and, no matter how carefully the organization may have been planned, they are bound to come in, in some form or other, to a greater or less extent, before you get your railroad built; you cannot avoid spending money—more money than you ought to spend, perhaps—for items of that sort, that are in the nature of a misfortune. A strike is a possibility; certain other elements of contingencies are probabilities."

Mr. Loweth, who has had, in many respects, the most thorough and instructive experience of all present day engineers in the United States, in that as Chief Engineer of the Chicago, Milwaukee & St. Paul Railroad, he performed the last great piece of railroad construction work in this country, the extension of that railroad through to the Pacific coast, in 1905-6, testified as follows: (R. pp. 459-464):

"The item of contingencies in the cost of reproduction of a given property should include those items of cost, whatever their character, that could not be seen in making an inventory of the property or which might be overlooked or by error or oversight omitted from such inventory and by the possible error in the unit cost that might be taken in making the valuation. The contingencies in making an estimate of the cost of a property to be built would cover those things which, due to the haste in which the matter was investigated, had been overlooked or which from the nature of the case could not be foreseen and provided for. I think that there is very little, if any, difference in the allowance for contingencies in the case of making an estimate of reproduction of an existing property and in making an estimate of the cost of property that was proposed to be built, for the reason that as we go over a completed property there are always some elements of cost that are not apparent. It is impossible to carry out any large piece of construction without accidents, accidents of such a nature that they involve a loss of life and property. Those losses enter in as one of the contingent items. In going over a completed property it is impossible to tell whether anything of that kind did happen or not, but from our experience in reconstruction we know that they certainly do happen. When we built our line to the Pacific coast our company spent between $250,000 and $300,000 to make trails and final roads across the Bitter Root mountains. We needed them to get over the country in order to make our surveys and to get our contractors over it and to get the contractors' materials in. There is no evidence of that item of expense today except that the roads are there and belong to the public. It was a contingent item in the cost of that construction. The item of contingencies arising from the necessity of changing the routing of material forwarded to near points from that planned, anything of that sort, almost invariably comes in and

sometimes in very large amounts in any large construction. Another instance in the construction of our line to the coast was that we had anticipated taking all of our track and bridge material out over our own line and carrying the completion of the line out from the Missouri River through to Butte, Montana, and we worked on that plan until we got pretty well into the State of Montana, and due to difficulties which were unsurmountable, we had delays in our grading, so that it was apparent that we would suffer a very serious delay in the completion of our line through to Butte unless we sent our material around by the N. P. road to Lombard and begun the laying of the track easterly from Lombard. That involved the paying of revenue freight on material for long distances, that was not a part of our plan. We are doing at the present time a large amount of new construction work involving 200 miles, more or less, of double tracking and new line construction in Iowa and a similar amount in Minnesota and South Dakota. We have been unable to get waterways completed, that is, bridges in and culverts in, so that in many cases the grading contractors have been obliged to leave openings in the embankments for these incompleted waterways or else to pile the material up at each side of the opening so that it could be put in after the opening was in. That will involve either one of two things, the handling of a large amount of material a second time or the leaving of the openings and temporarily bridging them and the handling and filling them later. In many cases we have put in a construction for waterway which was not the most economical, because of the urgency in getting that particular job done. It sometimes involves a change of plan from the original purpose. There are unexpected difficulties that come up and we find that it is necessary to stop and back up and start again, and that means the abandonment sometimes of work actually done. The contingencies in new construction of

that kind are oftentimes very large and they are more than is usually the case in building construction or in any kind of construction where the work is concentrated, such as it is in a large bridge, where the conditions can be readily seen. The building of a railroad extends over a great many miles of country and sometimes it is difficult of access and the natural conditions are very variable and it is impossible, practically speaking, to anticipate all of the difficulties, and so it is customary to add a considerable percentage for contingencies, and after the road is built and an estimate is made of what it would cost to replace it, there are a great many things that legitimately and properly enter into the cost of the road that cannot be discovered. Open cuts are sometimes found where it was originally intended to build a tunnel or perhaps where a tunnel was originally built. We had a case of that kind near Rosalia, Washington. A tunnel was built through a spur of the hill, I don't remember how long it was, but six or seven hundred feet, as nearly as I can recollect, and before the line was put on a construction basis we found that the material was yielding, before it was put on an operation basis, and notwithstanding that it was a well timbered tunnel, we had to make an open cut of it. The cost of doing that was considerable, because the time that it took to do it extended past the period at which the line had been opened up for traffic, and that enhanced the cost of doing the work. Another contingent item is that work of this character is subject to floods and fire. We are necessarily obliged to build across valleys and along streams. The time required for construction involves many months, sometimes two or more seasons, and floods occur and the work that is partly done is washed away and it has to be replaced. That cannot be guarded against. It is a contingent item. Our company had notable experience of that. We had our line approaching completion and some considerable track was laid between Deer Lodge, Montana, and Missoula, right side by side with the North-

ern Pacific. They were building at the same time and there was an unprecedented flood and the loss to our company from that flood aggregated something in excess of $600,000. It covered a matter of 75 miles or more, and about that same season we had on the other side of the Rocky Mountains in the Jefferson River and in the Musselshell River, a number of bridges in which we had put in the piers and the steel work had been delayed and we were carrying our construction trains over on false work and a flood came and so much drift collected in front of the structures that the stream was blocked and our permanent piers and false work was more or less washed out and we had to replace it, and in addition to the cost of replacing it was the delay to the work. Another contingent item was where a great many timber structures that were built and subsequently replaced by embankment, the intention was to make the embankments from the outset, but there was no material available within reasonable distance by haul by contractors' outfit and it was necessary to put in timber structures to take care of our construction train service, and fill by earth by train haul. The inspection of the completed property after the lapse of some years would not disclose the original expenditures for the trestles. Another contingent item is classification for material. There are many kinds of material which at the time that they are opened up would properly be classified as loose rock or hard-pan, and yet after the surface is exposed to weather they resemble common earth and in going over a road and looking at the surface or slopes of the cuts one would say confidently that that excavation was made in earth whereas by going into it more thoroughly you would find that it was hard-pan or a considerable portion of it was hard-pan. Another contingent item is the diversion of highways and private roads and waterways for one reason or another. It is necessary oftentimes to divert these, the cost of which involves extra right of

way, extra grading, oftentimes the moving of buildings and structures of various kinds. After the work is completed, especially after the lapse of a few months or years, there is no evidence of the diversion of highways, farm roads, no evidence oftentimes of the diversion of streams. A great many contingent items come in from unanticipated or unforeseen expenditures due to delay in transportation of material or equipment or men. In the building of a railroad there are large amounts of material to be purchased and gotten in hand and it is necessary that they should be gotten in hand in their proper order. Track cannot be laid if we have an abundance of ties and have no rail or if we have the rail and have not got the fastenings. Track cannot be laid unless we have the material in hand for the bridges and the culverts. If the material is not there, then either the track laying is deferred and the force of men and equipment stands idle or an expedient is resorted to which costs in many cases a great deal of money. It is of almost daily occurrence that a contingency arises in which you cannot stop to count the cost. It must be met and overcome no matter what it costs and if the material is not on hand for a bridge the ties will be taken and they will be cribbed up, and the track carried over that way. Then after the track is over and the material does come, why those ties, track, will be taken out and the bridge put in. That is only one of thousands of instances of that kind, all of which add to the cost of the construction. They cannot be avoided, or foreseen. They can be foreseen to this extent, that we know that they will come in all large construction and likely to be met with, but I say confidently that one who has not been right on the ground and seen and had experience with these conditions, can hardly realize the frequency with which they occur and the pressure that is brought to bear oftentimes to overcome them irrespective of what the cost may be. When we started to build our Puget Sound line, one

of the first things that we had to do was to cross the Missouri River and we had to get our material across, not only our material, but all the contractor's supplies. We were in a country where there wasn't anything, you might say, and we had to build a temporary bridge over the Missouri River and our construction account shows that after we credited up as much of that temporary construction to the construction of the permanent bridge as was reasonable and proper, that we spent in excess of $70,000, simply for facility to get a track across the Missouri River, that never would show up in any inventory that might be made of that piece of property today. The building of that bridge involved several contingencies. The river is subject to rather rapid rises. It has a very strong current and we had an unexpected break-up in the spring, and we lost a partly completed caisson. It was swept away from its moorings, taken down stream two or three miles, and the cost of recovering it was more than it was worth and it was abandoned. We had several fatal accidents. The cost of that bridge alone was slightly over $1,000,000, and we had, I think, two or three fatal accidents. In my judgment it would be conservative to put a contingent item of ten per cent. on the entire cost in making an estimate of the fair reproduction cost of the Duluth, South Shore and Atlantic road in the Northern Peninsula of Michigan. While the contingent amount on some items might not be as much as 10 per cent. on others it might very readily be much in excess. That would not include 10 per cent. on the cost of organization and legal expenses and interest during construction and engineering and the like, but upon the physical items, the cost other than the overhead items. In my opinion the 10 per cent. would be the average of all items and not the amount of contingencies applicable to each item. I think it is universal in making an estimate for new work, to allow for contingencies, add a percentage that cannot be defined,

and it has been our practice to add 10 per cent., and to add 10 per cent. after we had taken unit prices that in a measure made some allowance for the same. What is done will depend largely upon the thoroughness with which the estimate is made. The contingencies are variable, and you might build a hundred miles of railroad this year and have certain kind of contingent items and rebuild a piece of line side by side and of identically the same character another year and the contingent items be different. Contingent items depend upon the weather, upon labor conditions, and then again the contingent items, take for a hundred miles of railroad in one state, might be of a certain character and in another state they might be of still a different character. It is the unexpected that is covered by the contingent items. Contingencies would be a greater average on some classes of work than on others. For myself, I have gotten at the average by my experience and my observation. Sometimes the contingencies may not be as much as is estimated. At other times they may be much in excess, and an estimate of a certain percentage for contingencies I think from the very nature of the case, must be an estimate, and cannot be arrived at with any exactness."

"I am as confident as I could be of anything that has not occurred that in the reconstruction of the South Shore road, we would have casualties, accidents, which would involve injury to persons and property, which would be contingent items such as those I have mentioned, for work of that character, which would extend through three or more seasons. It is also quite sure that there would be contingent items in the way of floods. There would be contingent items in respect to classification. I doubt not that there is considerable material, the exact character of which would not be evident on a superficial inspection of the property. I do not see how that extent of railroad could be built without involving diversions in

the highways, in farm crossings, and in diversions of streams. Those contingent items would surely occur. There would be contingent items in connection with the construction of the road over or under or across other railroads, electric and steam; due to the crossing of telephone and telegraph wires which would have to be changed; due to the construction in the cities in which paving would be disturbed, water works pipe or sewers or things of that kind. There would be other contingent items, that would be more or less of the general character of those I mentioned. In my judgment there is a reasonable probability that these or a certain proportion of them will occur in every railroad that is constructed. The percentage would vary according to weather conditions, season of the year and character of the country through which the road was built. The contingent items would be smaller if all conditions were favorable, such as casualties, floods and things of that character. The items of farm crossings, highway crossings, of pavements in cities assume the passing through of a settled territory. If the territory is sparsely settled, the possibility of those items and the amount and percentage for them would be smaller, and for exactly the same reason, other contingent items would be more. There is, as I remember the country, a large proportion of swamp land and soft land, the surface of which is soft and yielding, and there would be a more than usual contingent item in the increase of earth work on that account. The country traversed by the South Shore railroad is not as accessible for the getting of supplies and men as a similar length of railroad would be in many other sections of the country, and the difficulties of getting labor and holding labor and getting supplies in, would be enhanced over and above what it would be in most any other section of the country, anywhere within a radius of 500 miles, or a thousand miles. Where the work is contract work, the contractor would bear the cost of casualties

and they would enter into his price. If he was financially able to carry out his contract, he would bear that burden, but contractors are not always able to do that, and when they fail, the railroad company has a contingent item that often varies considerably. I think the conditions might possibly be as favorable or as unfavorable that the contingent items might be as little as 5 per cent. and possibly as great as 15 per cent."

Mr. Hogeland testified (R. p. 475):

"The estimate of reproduction cost of a railroad should include items for contingencies. We found that during 5 years, 1903-1907, the total amount of additions and betterments to the Great Northern was estimated at $25,223,738.65, with an actual cost of the work of $29,096,067.47, an increase of 15.35%. The estimates were itemized in detail, and the engineers were familiar with the work to be done. That was the average; some actual costs fell below estimates. The estimates were made by competent assistants, and the work carried out by different, best fitted, departments."

Dean Cooley, probably the most eminent man in the engineering profession on the problems of public utility valuation, testified (R. p. 684-6):

"I have devoted practically my entire time, outside of teaching, to valuation work since 1899, and have directed or had to do with, or caused to be made, physical valuations of public service and railroad properties. The aggregate value of the various kinds of public utility properties I have had to do with is about twelve hundred and fifty millions. Those properties are steam and electric railroads, electric light and power plants, gas plants, water power and water power electric plants, and water works.

In 1900 I had charge of the valuation of the physi-

cal properties of all the steam railroads of Michigan, and in 1902 I assisted the Government in Newfoundland in the valuation of the mechanical elements of its railroads. Subsequently, I was Consulting Engineer in the valuation of the Wisconsin railroads, and I had charge of the re-valuation of Michigan railroads in 1903 and 1905.

I have, in a general way, kept myself informed of the progress of valuation practice to the present time; I have had something to do with it every year since 1900, and have from time to time engaged in discussions, prepared a few papers, and made a number of addresses, and lectured on the subject for the past five or six years."

"There is now a well known engineering practice on the valuation of public utilities, especially steam railroads. I believe the general practice followed in Michigan in 1900 has been followed in other states where valuations have been made, with some variations. Prior to 1900, there had been no physical valuation of railroads on a large scale. The method adopted in the Michigan valuation was to discover the cost to reproduce the existing properties, with all new elements, then to discover the extent to which the elements actually in use had depreciated, and to affect the cost for new elements by this depreciation, and to determine what we call the present value of the physical elements.

The methods followed by me in Michigan have since been known as the reproduction method. That method has generally been applied where physical values of steam railroads have been undertaken. I think the engineering practice has in general become settled upon the principles that follow in those valuations. There has been considerable discussion of different methods, but I think the majority of engineers have clung to the practice inaugurated in 1900, with some variation in details.

Since the Michigan appraisals, I have given no at-

tention to the South Shore, except in a general way, and have not been engaged by plaintiff to do work or testify for it in this litigation, and have had no formal conference with its representatives. I have had, in a general way, some idea of the progress of the work as it has been going on.

In a general way, in the light of the development of the practice since the 1900 appraisal, that is substantially the right way to ascertain reproduction costs of railroad property,—the one which has been followed,—and only the matter of overhead charges has been more completely elaborated than was possible in 1900. It embraces other elements, and treats them in slightly different ways, e. g., contingency, instead of being put in as a lump item spread over the entire cost, is now divided into two parts, at least, and distributed, varying in amount for the different elements, being larger for some and smaller for others. I have been accustomed to divide it into (1) contingency of construction and (2) contingency of inventory.

The contingency of construction is rather a variable item upon different roads. It is illustrated by such things as sink holes, unknown conditions surrounding bridge foundations, etc. The contingency of inventory is intended to cover the omission of things in the schedule. There never has been a complete inventory, I suppose.

In the Michigan appraisal, the contingency item was expressed by a given percentage of the physical items and some of the overhead items; it was there taken at 10%. I should—10% was as near correct as any other percentage. I have never found that I could depart far from it in my own practice; I have in a few cases dropped a little below, and in other cases gone above. I think 10% would apply to a property like the South Shore. The only question which might properly arise concerning a 10% charge

might be as to the items to which it is applied, whether to the entire valuation, including overhead costs, or that excluding the overhead costs. My recollection of the 1900 valuation is not entirely clear as to whether we applied contingencies to overhead costs; we did apply it to the physical schedule, including lands; we applied it in the same way to all the railroads of the State.

Since then, demands have been made by engineers to ascertain the appropriate percentage which should be charged to each item. We attempted to be more specific in the application in 1900, but could not make any investigation, because that valuation was completed in practically 90 days. The nature of the items or costs covered by contingencies do not permit of such analysis as to enable the appraiser to apply an appropriate percentage to each item of the schedule. If the engineer could satisfy himself in advance as to precisely the right element to call for contingencies, he would not need any contingency item. Broadly speaking, the item is to cover the unexpected things in construction and omissions in inventory. Because items are unexpected, and the omissions unknown, the items are called contingencies."

"In the absence of specific information which might be matters of record, and which would enable us to eliminate, to some extent, the element of doubt, I should not want to make an estimate of the cost of D. S. S. & A. or any other railroad, without allowing 10% for contingency item. I should not want to choose any other percentage in preference to the 10%, unless I had the very best reasons to do it.

The fact that on some items, as ballast, contingencies were much less than 10%, or nothing, would not impair the general truth of the statement or my opinion that 10% of the total would be about right. As to contingency applied to equipment, the railroad could reduce its contingency item by contracting to have equipment delivered at a stated price. This would

not reduce the contingency item to the builder, which goes in the cost of it. As the contingency is in the cost to the railroad, it does not have to allow another 10% but must allow something less.

I have known of instances where the actual cost came below the estimated cost—not as related to railroads though, but to buildings; I don't think of any such thing in railroad values just at this time.

I don't think there is very much to the claim that conditions which bear upon contingencies are different in case of an existing property and property to be built, where the conditions are not so well known. If the record showing the actual construction cost is available when the valuation is made, then you have information to enable you to eliminate a part, at least, of the contingency item, but, without complete records for the existing property, I think it is more liable to be far more accurate to determine a probable contingency cost from original specifications and plans than it would from an inspection of the property existing.

This is mainly for the reason that conditions existing at the time of construction are described in plans and specifications, and you can make your estimates accordingly, but, when you see the structure after it has been built for a time, there is, or may be, no knowledge of the conditions under which it was built. It is almost impracticable to make a good estimate of the cost of a building without first having plans made to get the proper estimate of quantities. I am of the opinion, after a good many years of thought on that particular point, that it is not only possible, but quite probable, that a more careful estimate of contingencies can be made, from plans and specifications, when the building is first built than after it is built.

I think that would apply to the valuation of the South Shore, unless the actual costs are matters of record, and are available. The lapse of time since

making the record might affect the matter seriously, because the conditions under which the work was done originally and under which it would now be done, might vary greatly.

At the time of construction of a railroad, the quantities and classes of material may, during the period of construction, be definitely ascertained, but on appraisal, when records do not disclose quantities and classifications, it is not easy to ascertain correct quantities and make appropriate classifications, unless care is taken to make careful measurements from the actual structure.

It is more difficult to determine the proper estimates years after the structure was built, and then there are many things which have gotten into the structures since they were built that did not enter into the original cost, such as the sinking out of sight of ballast. Before the work is done, the natural surface of the ground at the centerline is known; after the work has been done, unless profiles and records have been saved to disclose it, it cannot be ascertained with accuracy, unless you make careful survey again.

In the Michigan appraisal, I applied at least 10% to all the physical items. In my opinion, the amount of contingencies varies among the items, some items taking none and some more than 10%. The application of the 10% was to arrive at a sum which would be fair to cover the item, including both construction and inventory charges. The 10% was a contingency item to be applied to the property as a whole and not to the individual items; it would not be right to say that I had valued a specific item at the amount placed upon it plus 10%. In the nature of things, the item of contingencies cannot be defined, nor can all the things properly covered by it be listed, either in advance or in the work of the appraiser."

"The contingency item is not properly an overhead cost; it is a construction cost, and belongs in the body of the inventory."

The testimony shows that every engineer knows, from the history of his profession, that although all that appears in a railroad grade is a certain amount of earth in sight, the cost of which can be computed at so much a yard, yet that there must have been on such work certain expenditures, unknown to the estimator, which cannot be discovered or inventoried, but which were, nevertheless, indisputably there, and would be there if he himself were redoing the work. History has shown that these expenditures take place on every important piece of construction work; that they occur with almost fatal regularity, regardless of the care with which plans may be made to forestall them, and so regular are they in their occurrence that engineers everywhere recognize that they must add to their estimates of work, to be done, a certain additional amount to provide for the unknown, and they call this unknown "contingencies."

So, in estimating the cost of reproduction of property already constructed, when the work was done many years ago and time has destroyed all records of actual cost, these same engineers know that there must be added to the various physical elements found by them the element of this unknown cost, and they compute the same upon the proportion at which it has been found to occur in other construction work. This is not a matter of speculative dreaming on the part of the engineer; *it is his knowledge of certainty in the future from his experience and the experience of his profession in the past.* It is an elementary principle of logic that although a certain result may follow from a certain set of circumstances in one case, no conclusion may be drawn that the same result will always so follow. But when it is shown that from the same circumstances the same approximate result follows times without number, the conclusion must be that it is not an accidental happening, but is the logical result to be apprehended from such circumstances. We

do not base our opinion here that the Master's allowance for contingencies must be accepted because Mr. Riggs found such contingencies to occur on one piece of construction in the past, but because he has found them to occur on every piece of work ever performed under his direction; because Mr. Loweth has found them to occur on every piece of work ever performed under his direction; because Mr. Hansel and Mr. Hogeland and Mr. Cooley have found them to invariably occur on every piece of work ever performed under their direction; because the engineering profession, as a whole, from the days of the first engineer, have found them to so occur. We do not and cannot claim the Master's allowance to be the mathematically exact expense of this item, for it is below the allowance made by even the defendants' engineer. We do claim, however, that the figure adopted by him is so low and conservative as to relieve it of any possibility of error.

SCHEDULE 38.

Legal Expenses During Construction.

SCHEDULE 39.

Organization, Administration and General Expenses During Construction.

The plaintiff claims that allowances should be made for these items of value in the inventory, while defendants claim that no amount be allowed whatever for either of these schedules.

These elements of value in the property were recognized by the valuation engineers for both parties.

In computing the item of legal expenses, Mr. Riggs used the percentage method, applying ½% to all the preceding schedules. Mr. Hansel made an estimate of the

amount which would be required to be paid for legal expenses on a reconstruction of the road and fixed the item at a lump sum of $50,000., which was considerable less than the Riggs estimate. The Master adopted the Hansel theory and amount. (Master's Report, R. Vol. III., pp. 191-3).

In estimating organization, administration and general expenses, the engineers also differed in their theories, Mr. Riggs applying the percentage method, allowing 2% on the previous schedules and Mr. Hansel fixing it at a lump sum of $100,000. The Master adopted the Hansel theory, but increased the allowance to $125,000., which was considerable less than the figures of Mr. Riggs, and was abundantly justified by the testimony. (Master's Report, R. Vol. III., p. 194).

In view of defendants' contention that these items of value should be altogether disregarded, we shall discuss somewhat the nature of these allowances.

In this case they are not claimed in any way as promotion expenses, but as construction costs, just as much construction costs as the grading of an embankment. Mr. Riggs defines these expenses during construction as follows:

> "Legal expenses during construction is an item that is intended to cover the cost of services of attorneys during the organization and construction of the property, and to cover the actual expense of legal services in connection with the building of the property. On all of the construction work with which I have been connected there has been the element of legal service incurred throughout. The relation of the engineer during the construction of the roadbed across the lands acquired by the company require pretty constant services of an attorney; there are frequent controversies with contractors regarding the carrying out of construction contracts. The services of attorneys are needed frequently through-

out construction in the matter of looking after and caring for damages to property of adjacent owners, and damages by the setting back of water, building new embankments, by fire set by contractors or company equipment during construction, and on account of injuries to persons during construction; in short, I have never seen an extensive construction operation carried on where the services of attorneys were not almost as constantly in demand, although not in as large a force, as engineers. This item is one that engineers rarely include in their detailed estimates by reason of the fact that it is in the nature of an overhead charge placed by the general officers of the company. It has been customary in all of the state appraisals and in all of the appraisals made for railway companies, to make an allowance for legal services, either alone as an item by itself, or in connection with the item of engineering. It is usually expressed in a percentage of other items, just as I have done it here, and the percentage that I have used, ½ of 1 per cent, is a percentage that has been most generally adopted in valuation work during the past ten years. There was an allowance of ½ of 1 per cent made in the Michigan appraisal of 1900 and I think applied to substantially the same items as I have applied it (659-61).

"This item (organization, administration and general expenses during construction) is inserted to cover those expenses of construction which must necessarily be incurred in connection with the incorporation, organization, preliminary financing and administration of the property during the construction period, and the general expense covering clerical help, accounting forces and other official and clerical organization during the construction period, and the item of general expense, office rental, supplies and expenses incurred during the construction period and not otherwise provided for. I have not included in this any item to cover discount or bonus, nor any commissions, nor items of that nature, but I have included

a figure that I believe to be reasonable, to cover expense that would necessarily and properly be incurred in the construction of this railroad. In the past six or seven years I have been in a position to know much more about the actual cost of items of legal expenses during construction and of organization, administration and general expense during construction than in early years where I was on construction work purely as an engineer, and I do not know of a single instance where these items have not been incurred in large amount, and I do know of instances where these items exceeded the percentages named by me very materially. There was an allowance of 2 per cent made in the Michigan appraisal of 1900 to cover organization, administration and general expense during construction. Every appraisal of railroad properties that has been made by state authorities or railroad authorities has included this item under this name or some similar caption, and has used as a percentage a figure varying from 1½ per cent to 3½ per cent, most of them 2 per cent or 2½ per cent (662-4)."

The legal expenses paid and the expenses paid for office administration during the period of construction are actual outlays made by the owners of the road to bring the road into condition to operate. After the period of operation begins these items are charged into operating expenses. If, prior to the period of operation, the builders of the road are not entitled to charge them into capital account as a part of the cost of the property on which they are entitled to earn a return, the expenditure is forever lost and the remaining schedules without these expenditures do not show the true cost of construction.

So far as we have been able to ascertain an allowance for these items has never been seriously questioned in any rate case.

SCHEDULE 40.

Interest and Taxes During Construction.

Defendants contend that nothing whatever be allowed for the items in this schedule, even though the valuation engineers for both parties have made such an allowance.

The engineers differed somewhat in their method of computing interest during construction. Mr. Riggs estimated the time of construction as three years and allowed interest on the total of Schedules 1 to 38, inclusive, for one-half that period of time, which was shown by the testimony to be the generally accepted method for computing this item. See his testimony (R. p. 476); Cooley (R. p. 690-1).

Mr. Hansel, however, undertook to estimate the time during which the money required for each construction account would be invested before earnings would commence, and he made a schedule based on such estimate, assuming that the entire period of construction would be two and one-half years. He used 6% as his interest rate, and all the witnesses testifying on the subject agreed that the money for the construction could not be obtained at a less rate. (See Hansel's Appraisal, Deft. Ex. 15).

The Master found that the weight of the testimony was to the effect that the total time for the construction of such a road would not be less than three years. He adopted the Hansel method for computing this schedule, changing it, however, to allow for this greater period of time. (Master's Report, R. Vol. III, pp. 191-20).

The amount allowed by applying the Hansel method in this way was considerably less than if the method of Mr. Riggs had been used, and as thus made, the allowance was more than conservative.

Mr. Riggs allowed nothing for taxes during construction, but Mr. Hansel allowed the sum of $50,000 for this item. The Master found that a reasonable allowance

for taxes during construction is an element of the cost and value of the property, which must be included in a railroad valuation, and that the amount allowed by Mr. Hansel was too small, as Mr. Hansel expressly testified that his estimate was made on the assumption that some special arrangement would be made with the taxing officers by which a portion of the taxes which the property would regularly be required to pay would be waived, amounting to an assumption that the officers of the state would refuse to do their duty. The Master allowed for this item the sum of $100,000, which is less than one-half the amount which the plaintiff has paid to the State of Michigan each year for the past eight years for taxes on its property. (Master's Report, R. Vol. III, pp. 201-6.)

SCHEDULE 43.

Working Capital.

The Master allowed for this item an amount equal to the average monthly balance in the hands of plaintiff's Treasurer in the fiscal year 1913, after apportioning a portion of said sum to the Wisconsin operations on the basis of track miles. (Master's Report, R. Vol. III, pp. 208-11). It was the defendants' contention that no allowance should be made for this item, but the evidence in the case abundantly justified the Master in making such allowance. That working capital is a proper element of value in a rate case, has been recognized and approved by so many courts and commissions that it makes the citation of authority almost unnecessary. We cite, however, the following authorities on this point:

Cunningham *vs.* Water & Light Co., 5 Wis. R. C. Rep. 306.

Lincoln Gas & Electric Co. *vs.* Lincoln, 182 Fed., 926.

Cumberland T. & T. Co. *vs.* Louisville, 187 Fed., 646.

In reviewing this schedule, the trial court expresses the opinion as follows:

> "Defendants have not allowed anything for working capital, although the record shows that plaintiff has had on hand upwards of $100,000 for use in its current business. Working capital is necessary to the successful operations of any railroad, and when actually possessed, should be included in the appraised value of its property" (R. p. 83).

APPRECIATION.

In addition to the items of property contained in the appraisals of the two valuation engineers, there is one other element of value, which the Master found should be inventoried. By some witnesses it is called "appreciation"; by other witnesses it is called "solidification and adaptation of road-bed". It is the element of value which accrues to a railway from the settling and solidification of its banks, the gradual cleaning out of its cuts and the sodding of its slopes, and which element of value comes only by constant work on the roadbed and by lapse of time. Every engineering witness, who testified in this case on the question of valuation, agreed that this was an important item and its value would amount to a large sum.

Mr. Riggs testified (R. p. 144):

> "The cuts and fills on this road are in a condition today of absolute stability due to settlement, due to the fact that all of the erosion by water and various other forms of sloughing and settlement that will take place, have taken place, and that many, or I may say most of the embankments and slopes of cuts have become sodded over. The roadbed of the company is in very much better condition today than a new green unseasoned roadbed would be. It is better because there will be no settlement and the expense of main-

tenance is very materially less on an old, well seasoned roadbed that has become thoroughly adapted to conditions of drainage, that are formed or created by the construction of roadbed. As to the amount of labor required to maintain the roadbed of this company in the condition it is in now, compared with the same if new, in my judgment the cost of track maintenance would be increased on an average by the addition of two or more men per section for the first six or seven years to take care of the work of cleaning out of cuts and of replacing earth around embankments that had sunk down or been washed away."

Mr. Young testified (R. p. 264):

"A railroad embankment which is reasonably well maintained for railway operation appreciates in value. The road when it is first built settles constantly and it is necessary to employ a larger number of section men and do more work on the track in order to keep it in good operating shape, and the shoulders on the embankment wash down and it is necessary to haul more material on for shoulders until banks and cuts get grown over with vegetation so that they stay practically the same. Growth on slopes adds to the value of the property. It gets in fair shape in five or six years, and after ten years, it is practically permanent."

Mr. Hansel testified (R. p. 567):

"At the end of two and a half years you would not have as good a roadbed because it has to have age to season it; that cannot be included in reproduction. If the operation is successful, as to that item, reproduction estimate is always necessarily less than actual value as an operating tool. As an instrument of commerce the road bed solidifies by time and operation over it is better. Much of the road bed in flat, soft country is made of gravel, hauled from pits over

a long period of years. This is done at an increased cost over reproduction new estimate. It is impossible to say when construction ends and operation begins. A considerable amount of yardage must be moved after the contractor finishes and during the first years of operation to take care of settlement, shrinkage, maintaining shoulders, etc. As a practical matter, until you have sod on the bank, you must keep renewing it."

Mr. Cooley testified (R. p. 692):

"Some elements of the property appreciate in value with lapse of time and maintenance, being particularly that part of the road bed below the ties. I have never given study to the subject or attempted to analyze any railroad property with a view to determining what the appreciation might be. While we considered the elements in the Michigan valuation, we made no figures or allowances. It is my opinion that appreciation should be taken into account in getting at the present value. Assuming two properties with reproduction costs the same, one brand new and the other ten years old, the present value column of the older would be greater than that of the newer road. The appreciation comes about in increased solidity of embankment and increased thickness of ballast, which is constantly put under the ties and distributed in the embankments, thereby enriching them, making them more stable, improving the drainage, increasing the safety, in greater solidity and increased permanence of road bed and the ease with which the grade and alignments are maintained, thereby reducing operating costs, the hauling power and the maintenance expense. Such appreciation of an old road bed with lapse of time is recognized as a substantial element of value by railroad engineers generally."

Only one witness furnished a standard by which the value of the element of appreciation could be measured

in money. His testimony on this point stood uncontradicted. The witness was Mr. Riggs, who testified that this value could be expressed by the additional cost of two or more men per section for the first six or seven years after the construction of the road. All the elements were in the case for putting this estimate of Mr. Riggs into figures, and, using two men and six years, the amount arrived at was $553,000.00.

The Master, however, allowed only the sum of $300,000. (Master's Report, R. Vol. III, pp. 212-221).

There is abundant authority in law, as well as in reason, for the inclusion of this item in the value of plaintiff's property, and we need go no further in the search for authorities than to refer to the Minnesota Rate Cases, *230 U. S. 352*, where this court expressly recognized that there may be such an element of value, which when properly proved, should be allowed.

The trial judge, however, in his opinion suggested that

> "the claim for appreciation of roadbed is quite uncertain and speculative. Undoubtedly a well maintained roadbed increases in efficiency and value with age. The older it becomes, the less is its cost of repairs and upkeep. But in a case of this kind an allowance for such appreciation must be supported by positive proofs, which measure the value therein in terms of money."

Answering this assertion, that in this case the proofs as to the amount of increased value in the road bed by reason of appreciation were not "positive proofs which measured the value therein in terms of money", we shall say that from the outset in considering this problem we were confronted with the practical difficulty of obtaining clear, definite and exact mathematical proofs on this point, for such an item of value is concededly not capable

of exact mathematical measurements. We might, to be sure, have secured an engineer's or contractor's estimate of what the cost would be if men were set to work all over 491 miles of new road bed, with tamping tools, tamping and tamping and tamping, until they had made the roadbed in as solid and compact a condition as has resulted from the action of the elements, the rain and the frost and the pounding of trains through thirty and forty, and in some portions the line, through sixty years of constant use. We could also have furnished an engineer's or contractor's estimate of what it would cost to take a new road bed of 491 miles and sod the slopes in as complete and satisfactory manner as the slopes of plaintiff's railroad are now sodded, making the slopes proof against the washing away by the elements. But when we had obtained such figures and presented them to the court for consideration, they would have been so enormous that we would have difficulty in getting any court to adopt them. But because no exact calculation can be made as to any certain element of value is no reason why that value should be disregarded if it is possible to adopt a figure which is so moderate that there can be in the minds of the court no question as to the figure being far within the limits of any calculation that could possibly be made. For example, we believe that it would not be difficult, on very general testimony, without detailed estimates or computations, to obtain a finding from any court that the value of the real estate in the District of Columbia is at least $10,000,000. So in the case at bar, we believe that the master was more than justified in the conclusion which he reached, that

> "As the fact of appreciation is proved by uncontradicted evidence, and as there is some evidence of the amount of that appreciation, which evidence is uncontradicted, and as the complainant is clearly entitled to the amount of the appreciation when shown,

it seems to be clearly my duty to give effect to the evidence as to the amount of appreciation, and allow the amount thereby shown for appreciation in the value of the complainant's property; but with the recommendation, however, that this finding be neither approved or disapproved without first giving opportunity for a fair trial of the question by the introduction of further evidence by each party."

"That my allowance of $300,000 for this item of appreciation is conservative I am fully convinced, in view of the testimony of all the witnesses as to the greatly increased value of complainant's roadbed by reason of adaptation and solidification, and my conviction in this regard finds further confirmation in the fact that in the Minnesota rate cases, the State conceded that the adaptation and solidification of the roadbed of the Northern Pacific Railroad amounted to the sum of $1,613,612, which was over 15% of the remainder of the grading item as found by the Master, whereas the allowance which I have made is less than 11% of the remainder of my grading schedule."

"As to the propriety of this allowance, the only possible question is the above described question as to the sufficiency of the evidence as to its amount. That there has been some appreciation in the value of the property is shown and not disputed; that in order to reach a proper estimate of the value of the property under the method of valuation employed in rate cases, any appreciation in value that has taken place must be added to reproduction cost less depreciation, there is no room for question either on authority or on principle. In such method of valuation, depreciation must be allowed, and depreciation cannot be allowed without the allowance also of appreciation. The two are there vitally and inseparably connected. The latter is the necessary corollary of the former. Every reason which calls for the allowance of depreciation calls equally for the allowance of appreciation. The ground on which depreciation

is allowed in such method of valuation is that it is a necessary step in determining the amount that it would cost to acquire the property in its present condition as regards depreciation, it being assumed that the purchaser will be willing to pay for the property, its cost of reproduction less existing depreciation. But to determine value it is not enough to find only what the purchaser will be willing to pay; it is equally necessary to find what the vendor will be willing to accept, and in finding this, it is just as necessary to allow for appreciation as it is to allow for depreciation in finding what the purchaser would be willing to pay. In this case the allowance for depreciation on the entire property amounts to a very large sum —being in excess of $2,000,000, and it is allowed because it appears that such depreciation exists. But it also appears that while that depreciation was taking place, some appreciation was also taking place, and it would be a manifest injustice and an irrational application of the method of valuation employed to deduct $2,000,000 from reproduction cost on account of existing depreciation and fail to add anything on account of existing appreciation" (R. Vol. III, pp. 219-221).

It will be noted that among all the questions considered by the Master in his report, this is the only one as to which he suggests that the parties be allowed to offer further proof; and although defendants were given every opportunity so to do on the hearing before the court, they introduced not a syllable of testimony on that point. The only proper conclusion to draw from their failure to meet this issue when the opportunity was afforded them is that they must have been advised by their engineers that any attempt to attack the conservative figure adopted by the Master would result in an increase rather than a decrease in the figures to be taken as the value of plaintiff's property.

DIVISION OF PROPERTY BETWEEN MICHIGAN AND WISCONSIN.

Nearly all of the property owned by the plaintiff can be easily allocated either to Michigan or to Wisconsin. As to property which is in use in both States, such as rolling stock, methods of apportionment have been used which have been accepted by both parties as proper.

The only real dispute between the parties is as to the shops and round houses of the plaintiff, which are located in Michigan, and the machinery therein. Defendants claim that a portion of these values should be assigned to Wisconsin. It is defendants' theory that as the shops of the plaintiff, which are located in Michigan, are used for the repair of equipment which is used in both States, and as the round houses in Michigan house engines which run in both States, a portion of their value is attributable to the Wisconsin operations. So far did defendants go in their theory, that they even asserted that a portion of the value of station buildings in Michigan should be assigned to Wisconsin, on the ground that such buildings are at times used by passengers who travel into Wisconsin. We do not think, however, that defendants ever carried their theory as to station building as far as to make actual apportionments. The Master yielded to this contention of the defendants as to the general shops at Marquette, and the round house at Thomaston, which is near the State line, and houses locomotives running in both States. None of the other round houses are used for locomotives engaged in the Wisconsin operations. The Master assigned to the Wisconsin business a portion of the value of the Marquette shops and the machinery therein upon the basis of the track miles in Michigan as compared with the track miles on the whole line, being the basis contended for by defendants, and also assigned to Wisconsin a portion of the value of the Thomaston

round house, on the basis of the track miles between Marquette and Superior, these being the termini of the runs of all locomotives housed at Thomaston. (Master's Report, R. Vol. III, pp. 222-5).

Inasmuch as these shops and these round houses are located entirely in Michigan, are taxed as Michigan property, and the plaintiff would have to have them to use in its operations if it had no lines in Wisconsin, we submit that their whole value should be included as Michigan property, upon which the plaintiff is entitled to earn a return. The theory of defendants, if carried to a logical conclusion, would involve the property into such a complication of apportionments as to make the real value altogether impracticable of ascertainment. For example, there are small repair shops at Superior, Wisconsin, which are used for repairing equipment which runs into Michigan, and, upon defendants' theory, such shops should be valued and a portion of the value assigned to Michigan. So there are round houses located in Wisconsin which house locomotives running into Michigan. If, on defendants' theory, a portion of the value of the station buildings in Michigan should be assigned to Wisconsin, so also should a portion of the value of the station buildings in Wisconsin be assigned to Michigan, and so on with almost every item of property. We submit that the true rule should be that all property having a situs in Michigan should be valued as Michigan property.

EFFECT ON THE VALUATION OF THE INCREASE IN UNIT PRICES IN 1917.

In considering the operations of the past, it is the claim of the plaintiff that the court should adopt a value for each year at least as high as that adopted by the Master in 1913; and for the subsequent years, a value at least as high as that value plus the net addition.

For the year 1917, it is the claim of the plaintiff that the court should adopt a value which may not necessarily be based upon all the high prices which the plaintiff in its computations put on labor and materials in that year; but which must take into account these prices of labor or materials, in so far as the court is able to conclude that they represent actual prices as they will exist in this country for some time to come.

One thing took place on the hearing before the court, which tended to emphasize the situation most clearly. Mr. Kates, the engineer who valued plaintiff's equipment for the defendants, testified that he valued the equipment for each year during the years 1914 to 1917 according to the normal values of all equipment of the same character upon the Western Railroads of the United States in the period between 1910 and 1914; except that where he found an actual purchase by the plaintiff of new equipment during the years 1914 to 1917, he substituted for his estimated figures the actual purchase price of that equipment. It appears that in the year 1917, the plaintiff had actually purchased one new locomotive. The price fixed by Mr. Kates for that locomotive, being the actual purchase price thereof, was more than 60% in excess of the value which would have been placed by him on that locomotive under his so called "normal price" method.

The plaintiff has on its railroad many locomotives of modern design, which, if they were destroyed today, the plaintiff would wish to replace in kind. To replace those locomotives in kind would not cost the amount which Mr. Kates fixed as their value, nor which the plaintiff's witnesses fixed as their value, nor the amount which the Master found to be the value. It would cost 50% and in some cases more than 100% more today. The increased replacement cost does not only apply to locomotives, but to everything else in the whole inventory. We think that

there is no question that the replacement cost of the whole railroad if it were obliterated tomorrow, would be 50% in excess of the replacement cost in 1913. It will continue to be greater than in 1913 during the next year and the year after, and many years after that, if the opinions of the witnesses, and the conclusion which we all in our own minds have as to the permanency of present prices is at all true. Therefore, it is our belief and contention that it is the duty of the court to give effect to the large increase in the replacement costs of plaintiff's railroad as in their best judgment they consider such increase may be reflected in the conditions of tomorrow and the conditions of the future, so far as the future appears to us now.

Respectfully submitted,

WILLIAM D. McHUGH,

JOHN E. TRACY,

Counsel for Plaintiff and Appellee.

No.	SCHEDULE
1	Right of Way and Station Grounds—Including expenses of purchase and condemnation, abstracts, fees and commissions—Not included in 1913 Riggs Appraisal
2	Real Estate Not Used in Railway Operation—Including expenses of purchase and condemnation, abstracts, fees and commissions
3	Grading—Including clearing, grubbing, grading, channels, drainage, overhead, corduroy construction, retaining walls, rip rap and sea walls
4	Tunnels
5	Bridges, Trestles and Culverts—Including foundations and superstructures over water courses, streets and other railways including ¾ z on bridges and wooden and steel guard rails
6	Ties—Track Cross Ties—Not including switch or bridge ties—including transportation, handling and preservation of main line ties
7	Rails—Including transportation, handling and inspection of main and branch line rails—not including steel guard rails on bridges
8	Track Fastenings—Including transportation, handling and inspection of main line fastenings—not including fastenings used on bridge guard rails
9	Frogs, Switches and Crossings—Including transportation, handling, inspection and labor of placing in track and including all head blocks and switch ties
10	Ballast—Including cost of material, loading, transportation, unloading and placing in track of ballast for main and branch lines
11	Track Laying and Surfacing—Including distributing and laying rails, ties and fastenings, track construction and surfacing, but excluding side track and switch construction
12	Fencing—Roadway fencing and snow fences, not including stock yards or shop yard fencing, or fences around stations or section houses
13	Crossings, Cattle Guards and Signs—
14	Interlocking and Signal Apparatus—Including cost of transportation, foundations and installation
15	Telegraph and Telephone Lines—Including material, labor and transportation—All lines joint ownership with Western Union—D., S. S. & A. proportion, labor only
16	Side Tracks—Including grading, ties, rails, track fastenings, ballast and labor of construction of side tracks, excluding turnouts
17	Station Buildings and Fixtures—Including heating, lighting, plumbing, platforms and walls
18	General Office Buildings and Fixtures
19	Shops, Engine Houses and Turntables—Including transfer tables, pits, oil and sand houses, line and shops houses
20	Shop Machinery and Tools—Including boilers, engines, shafting, cost of transportation, foundations and installation
21	Roadway and Construction Tools—Including tools and equipment of roadway and bridge and building departments
22	Water Stations—Including pumps, boilers, rams, tanks, stand pipes, wells, intakes, dams, piping, foundations and installation
23	Fuel Stations—Including platforms, sheds, pocket chutes, racks and machinery, derricks, booms and trestle approach embankments, concrete floors and foundations
24	Grain Elevators
25	Warehouses—All included in other classifications
26	Docks and Wharves—Ferry landings, mercantile docks, ore docks, buildings, machinery, lighting and equipment—all tracks on docks are included in side track schedule
27	Electric Plants—Light and power—including engines, dynamos, switchboards, machinery, power transmission and distribution lines, lamps, etc., including material and labor
28	Miscellaneous Structures—Including all buildings, stock yards, scales and scale houses and other structures not specifically enumerated in other groups
29	Engineering on Roadway and Structures—Including salaries, expenses, supplies and transportation of engineers, inspectors and architects and fees for inspection of material and machinery
	Fixed by Riggs at 4% of Items 1 to 28 inclusive. Estimated by Hansel
30	Locomotives—Including tenders and all attachments
31	Passenger Train Cars—Including passenger, express, mail, baggage, buffet, dining, sleeping, chair and official cars
32	Freight Train Cars—Including all classes of freight train cars
33	Miscellaneous Equipment—Including steam shovels, derricks, wrecking outfits, unloaders, snow plows, etc.
34	Ferries and Steamers—All vessel properties. Hansel shows separately. See Appendix
35	Engineering on Equipment—Including all engineering salaries and expenses connected with the purchase or construction of equipment — Fixed by Riggs at 3% of Items 30 to 34 inclusive
	Hansel at 2% on Items 30 to 33 inclusive
36	Terminals—Interest owned by D., S. S. & A. R'y in Joint Terminal and Bridge Properties, including engineering upon all structures, Hansel shows separately—See Appendix
37	Contingencies
	Sub Total 1—Physical Properties
38	Legal Expenses—During construction—¼ of 1%, Items 1 to 37 inclusive—Estimated by Hansel
39	Organization, Administration and General Expenses during Construction—Riggs, 3% of Items 1 to 37 inclusive—Estimated by Hansel
	Sub Total 2
40	Interest and Taxes during Construction
41	Furniture and Fixtures
42	Stores and Supplies
43	Working Capital
	Grand Total State of Michigan

TLANTIC RAILWAY

1913 APPRAISAL

SUMMARY

	Riggs—1911—Exhibit 1							Hamel—1912—Exhibit 15						Riggs—1913		
	Original Totals		Modifications Additions		Modifications Deductions		Modified Totals	Original Totals		Additions		Modified Totals		Exhibit 1-A		No.
	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.	C.R.	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.	C.R.	P.V.	
	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	
	2,311,923	2,311,923			14,756	14,756	2,297,167	1,270,883	1,270,883	65,904	65,904	1,466,787	1,466,787			1
	12,733	12,733			12,733	12,733	0	0	0			0	0			2
	2,279,494	2,279,494	111	111			2,279,605	2,442,811	2,419,763			2,442,811	2,419,763	2,289,743	2,286,986	3
	0	0					0	0	0			0	0	0	0	4
	647,856	647,856			12,282	10,050	635,574	659,412	342,486	25,420	22,420	694,832	360,944	632,241	625,535	5
	492,000	290,000			26,296	15,770	465,400	673,504	315,427			673,504	315,427	571,309	342,725	6
	1,500,533	1,152,378	27	23			1,500,560	1,421,697	1,158,280			1,421,697	1,158,280	1,565,326	1,221,984	7
	237,074	174,655	9	9			237,073	236,541	182,568			236,541	182,568	226,036	171,618	8
	195,526	111,120			6,077	2,400	189,449	102,122	63,180			102,122	63,180	203,609	123,060	9
	646,905	646,905	4	4			646,909	657,807	560,490			657,807	560,490	657,749	657,749	10
	253,374	253,374	7	7			253,381	296,430	296,430			296,430	296,430	261,479	261,479	11
	105,185	54,179					105,185	118,830	61,400			118,830	61,400	109,632	83,196	12
	19,469	13,116					19,469	16,171	11,912			16,171	11,912	16,908	12,603	13
	1,350	1,545					1,350	1,000	800			1,000	800	1,350	1,515	14
	82,951	37,066					82,951	82,951	37,066			82,951	37,066	82,960	37,072	15
	735,006	681,222	13,226	105,158			811,622	713,303	555,527			713,303	555,527	800,439	735,689	16
	168,963	138,393					168,963	161,783	126,460			161,783	126,460	172,540	143,468	17
	0	0					0	0	0			0	0	0	0	18
	289,200	182,088			2,200	1,200	287,000	231,151	186,785	21,620	12,220	252,771	169,005	266,301	197,460	19
	94,827	75,900					94,827	114,549	92,010			114,549	92,010	119,091	90,140	20
	16,040	12,832					16,040	16,040	12,832			16,040	12,832	16,041	12,832	21
	88,405	70,722					88,405	97,689	68,219			97,689	68,219	91,206	72,422	22
	100,494	75,486					100,494	86,540	60,552			86,540	60,552	101,933	78,722	23
	0	0					0	0	0			0	0	0	0	24
	0	0					0	0	0			0	0	0	0	25
	1,549,122	794,310					1,549,122	853,001	488,139			853,001	488,139	1,200,078	680,036	26
	9,607	8,855					9,607	9,607	8,768			9,607	8,768	9,607	8,855	27
	188,688	183,855					188,688	177,815	136,270			177,815	136,270	170,376	133,136	28
	427,516	427,516					427,516	255,000	255,000			255,000	255,000	468,270	468,270	29
	664,966	443,304					664,966	684,322	466,552			684,322	466,552	907,550	702,243	30
	336,941	220,583					336,941	421,466	283,354			421,466	283,354	406,002	272,934	31
	1,895,147	1,045,920					1,895,147	1,842,904	1,097,890			1,842,904	1,097,890	1,966,866	1,306,019	32
	73,172	30,144					73,172	102,995	66,172			102,995	66,172	83,712	50,972	33
	288,687	173,000					288,687	0	0			0	0	223,000	216,000	34
	88,894	88,894					88,894	61,042	61,042			61,042	61,042	71,772	71,772	35
	147,662	138,332			27,824	29,474	119,838	0	0			0	0	120,000	108,000	36
	1,196,480	691,597					1,196,480	479,735	479,735			479,735	479,735	1,122,046	982,917	37
	17,824,488	13,980,706					16,977,935	14,150,128	11,227,263			14,312,072	11,388,794	15,827,830	12,548,822	
	85,122	85,122					85,122	70,000	70,000			70,000	70,000	77,637	77,637	38
	240,490	240,490					240,490	100,000	100,000			100,000	100,000	210,551	210,551	39
	17,469,096	14,356,320					17,402,544	14,320,128	11,397,263			14,482,072	11,558,794	15,918,717	12,936,810	
	1,208,757	1,208,757					1,208,757	809,058	809,058			809,058	809,058	1,193,679	1,193,679	40
	12,982	9,735					12,982	12,982	9,735			12,982	9,735	12,471	9,353	41
	229,271	229,271					229,271	280,050	280,050			280,050	280,050	308,502	308,502	42
	198,000	198,000					198,000	100,000	100,000			100,000	100,000	154,000	154,000	43
	19,108,105	16,132,083					19,152,554	15,531,327	12,596,114			15,684,171	12,727,640	17,594,369	14,602,343	

though unremunerative, extension of service because furnished by acquiring traffic rights from another company. P. 613.

(3) Sleeping car, parlor car and dining car services should not be treated as separate operations, but the passenger service, including these facilities, must be treated as a whole. *Id.*

(4) In the present state of railroad accounting, what formula should be adopted for dividing charges and expenses common to freight and passenger services and not capable of direct allocation, is a question of fact rather than of law; and the court cannot say that the trial court erred in adopting the method pursued in this case. P. 614.

Affirmed.

THE case is stated in the opinion.

Mr. Leland W. Carr and *Mr. Roger I. Wykes*, with whom *Mr. Alex. J. Groesbeck*, Attorney General of the State of Michigan, was on the brief, for appellants.

Mr. John E. Tracy, with whom *Mr. William D. McHugh* was on the briefs, for appellee.

MR. JUSTICE BRANDEIS delivered the opinion of the court.

The constitution of Michigan (Article XII, § 7) authorizes the legislature to pass laws establishing "reasonable maximum rates of charges for the transportation of passengers and freight." In 1907 it fixed two cents a mile as the maximum intrastate passenger fare on railroads operating in the Lower Peninsula and three cents for those in the Upper. By Act approved May 2, 1911 (Public Laws No. 276), the two-cent rate was made applicable to all the railroads of the State whose gross earnings on passenger trains equal or exceed $1,200 per mile of line operated. Before the statute took effect, the Duluth, South Shore and Atlantic Railway Company, an interstate carrier operating in the Upper Peninsula, brought this suit in the District Court of the United States for the Eastern District of

Michigan to enjoin the enforcement of the act. The bill alleged that the reduced rate would deprive plaintiff of its property without due process of law in violation of the Fourteenth Amendment. The Attorney General and the Railroad Commissioners of the State, being charged by the law with its enforcement, were made defendants. They denied that the rate was confiscatory; and on this issue the District Court found for the Railway. A final decree granting the relief sought was filed February 14, 1918; and an appeal to this court was promptly applied for by the defendants and allowed. Meanwhile, on January 1, 1918, the Federal Government had taken over the operation of this and other railroads, and is still operating the same. The two-cent rate was never put into effect on this railroad, as a restraining order issued upon the filing of the bill was continued until entry of the final decree. In 1919 the statute attacked here was repealed (Public Laws No. 382). But the case has not become moot for the following reason: On continuing the restraining order the Railway was required to issue to all intrastate passengers receipts by which it agreed to refund, if the act should be held valid, the amount paid in excess of a two-cent fare. Later the Railway was required to deposit, subject to the order of the court, such amounts thereafter collected. The fund now on deposit exceeds $800,000, and the refund coupons are still outstanding. In order to determine the rights of coupon holders and to dispose of this fund it is necessary to decide whether the Act of 1911 was, as respects this railroad, confiscatory.

The issues of fact were tried below with great thoroughness. The case was referred to a special master to hear the proofs and to report the evidence together with his findings to the court. The report fills 503 pages of the printed record. The transcript of the testimony introduced before him covered more than 12,000 typewritten pages; and there were besides many exhibits. The evidence before the

GROESBECK ET AL. *v.* DULUTH, SOUTH SHORE & ATLANTIC RAILWAY COMPANY.

APPEAL FROM THE DISTRICT COURT OF THE UNITED STATES FOR THE EASTERN DISTRICT OF MICHIGAN.

No. 254. Argued October 15, 1919.—Decided November 10, 1919.

The laws of Michigan prescribing a maximum intrastate passenger fare for railroads whose gross passenger earnings equalled a certain amount per mile required that all lines of a railroad within the State should be treated as a unit in computing such earnings, and in applying the rate limitation. In determining whether the rate was confiscatory in this case—

Held: (1) In the absence of any suggestion of illegality or mismanagement in acquisition or operation, all parts of the railroad's system within the State, profitable or unprofitable, should be embraced in the computation. P. 611.

(2) Unremunerative parts were not to be excluded because built and used primarily for interstate traffic (p. 611), or because not required to supply local transportation needs (p. 612); nor was a reasonable,

master related largely to the results of the operation of the railroad for the four years ending June 30, 1913. When the case came on for hearing before the district judge in 1917, supplemental evidence was taken in open court covering the operations of the four additional years ending June 30, 1917. The evidence disclosed the usual diversity of opinion as to the value of the property and as to the proper method of dividing between the passenger and freight services the common expenses and the charges for property used in common. Upon the whole evidence the court found that the two-cent fare would have resulted in a return on intrastate passenger business of less than 2 per cent. during the six years ending June 30, 1917.

Between the commencement of this suit and the entry of the final decree many of the questions in controversy below have been settled by the decisions of this court in other cases.[1] The state officials do not deny that there was legal evidence to justify the findings of fact made by the lower court; nor do they request that this court should undertake a general review of the evidence. But they insist that the finding of the district judge of the low return is erroneous, and that the error is due partly to his having included in his calculations property and operations which

---

[1] *Interstate Commerce Commission* v. *Union Pacific Ry. Co.*, 222 U. S. 541; *Minnesota Rate Cases*, 230 U. S. 352; *Missouri Rate Cases*, 230 U. S. 474; *Chesapeake & Ohio Ry. Co.* v. *Conley*, 230 U. S. 513; *Oregon R. R. & Nav. Co.* v. *Campbell*, 230 U. S. 525; *Southern Pacific Co.* v. *Campbell*, 230 U. S. 537; *Allen* v. *St. Louis, I. M. & S. Ry. Co.*, 230 U. S. 553; *Missouri Pacific Ry. Co.* v. *Tucker*, 230 U. S. 340; *Wood* v. *Vandalia R. R. Co.*, 231 U. S. 1; *Louisville & Nashville R. R. Co.* v. *Garrett*, 231 U. S. 298; *In re Englehard*, 231 U. S. 646; *San Joaquin, etc., Irrigation Co.* v. *Stanislaus County*, 233 U. S. 454; *Northern Pacific Ry. Co.* v. *North Dakota*, 236 U. S. 585; *Norfolk & Western Ry. Co.* v. *West Virginia*, 236 U. S. 605; *Missouri* v. *Chicago, B. & Q. R. R. Co.*, 241 U. S. 533; *Rowland* v. *St. Louis & San Francisco R. R. Co.*, 244 U. S. 106; *Darnell* v. *Edwards*, 244 U. S. 564; *Denver* v. *Denver Union Water Co.*, 246 U. S. 178.

should have been excluded, and partly to his having adopted improper formulas for the division of common charges and expenses as between the freight and the passenger services; and that if these specific errors are corrected it will appear that the two-cent fare would have been highly remunerative. These alleged errors must be considered separately.

First: It is contended that the Western Division should be excluded from the calculation. The Duluth, South Shore and Atlantic Railway extends from Sault Ste. Marie to Duluth and has, including branches, 584 miles of line, 475 of which are in Michigan. The Eastern Division serves mainly the iron region; the Central, the copper country; the Western, extending through sparsely settled country from Nestoria, Michigan, 101 miles to the Wisconsin state line, and thence to Duluth, serves mainly interstate business. This division is said to have been built not in a desire to serve local needs, but for the purpose of establishing a through line from Duluth to Sault Ste. Marie. The statement, if true, furnishes no reason for excluding it from the calculation. The cost per mile of transporting passengers varies greatly on different parts of the same railroad system according to circumstances, being dependent, among other things, upon the cost of the roadbed and terminals, the grade, the number and character of the trains, the density of traffic and the length of the haul. The justification for a uniform fare per mile is furnished by the doctrine of averages; and the legislature of Michigan made clear its purpose to apply the doctrine of averages in order to give to travellers the benefit of the two-cent fare on those portions of a railroad on which travel was light and the cost of carrying each passenger necessarily far in excess of two cents a mile. For this act declares: "That in computing the passenger earnings per mile of any company the earnings and mileage of all branch roads owned, leased, controlled or occupied or that may here-

after be owned, leased, controlled or occupied by such company . . . shall be included in the computation; [i. e., determining whether the year's gross passenger earnings equal $1,200 per mile] and the rate of fare shall be the same on all lines owned, leased, controlled or occupied by such company." In other words, the legislature has declared that for the purpose of determining the right of an intrastate passenger to travel on any part of the company's lines at the rate of two cents a mile, all of the lines within the State must be treated as one; that those on which travel is light must be averaged with those on which it is dense; and obviously also that those parts of the system which are unprofitable must be taken with those which are profitable. Every part of the railroad system over which the passenger is entitled by the act to ride for a two-cent fare must be included in the computation undertaken to determine whether the prescribed rate is confiscatory. This is true, at least, in the absence of illegality or mismanagement in the acquisition or operation of the division in question; and of such there is not even a suggestion in the record. There is nothing in *San Diego Land & Town Co.* v. *National City*, 174 U. S. 739, 758, or in *San Diego Land & Town Co.* v. *Jasper*, 189 U. S. 439, 446, upon which the state officials rely, which is inconsistent with this conclusion.

Second: It is likewise contended that the so-called South Line between Marquette and Ishpeming should be excluded from the calculation. This line which for miles substantially parallels the main line, was originally built as an independent road and was purchased by plaintiff's predecessor in 1884, probably to avoid ruinous competition. It is used mainly for heavy freight, and the intrastate passenger travel over it is light. It is asserted that the construction of this road was not required to supply the transportation needs, and that it would still be possible to carry all existing traffic between Marquette and

Ishpeming over the main line. What has been said above in regard to the Western Division applies equally to the South Line.

Third: It is contended also that a loss was incurred in operating through passenger trains from Houghton over the Mineral Range Railroad to Calumet and that such loss should be excluded from this calculation. This extension of plaintiff's service was clearly reasonable in view of the importance of Calumet, which lies only fourteen miles from its own lines. It was admitted by the state officials that passengers on the route were, under the act, entitled to travel at the two-cent rate. The fact that the service was furnished by acquiring traffic rights instead of by building an independent line, clearly affords no reason for excluding the results of the operation from the calculation.

Fourth: The further contention is made that the sleeping car, parlor car and dining car services should be treated as separate operations; that they should be charged with their proportion of specific and general expenses but credited only with the amounts received from charges for the specific service; and that no part of the apparent loss on these services should be taken into consideration in determining whether the two-cent fare is confiscatory. In support of this contention it is urged that these services were voluntary; that the law (Michigan Public Acts of 1875, No. 38) permits railroads to make special charges for these services "in addition to the regular passenger fares allowed by law," and that travellers in day coaches must not be allowed to suffer because a railroad fails to make these services compensatory. On American railroads of importance these services have been well-nigh universal for more than a generation; and the charges for them are substantially uniform throughout the country. It would be practically impossible, as it would be obviously unwise, for a railroad like the plaintiff's either to discontinue the

services or to increase the charges to cover the cost of the particular service on its line. It is inconceivable that the legislature of Michigan should have intended in enacting the two-cent fare law to deny to its citizens these customary facilities; and for the purpose of determining whether the act is confiscatory the passenger service including these facilities must be treated as a whole. The fact alleged that these facilities are used mainly by interstate travellers is immaterial.

Fifth: The remaining objection relates to the formula adopted by the lower court for dividing charges and expenses common to freight and passenger services, and not capable of direct allocation. What method should be pursued in making such division is a very difficult problem to which railroad accountants, the Interstate Commerce Commission and state railroad commissions have for years given serious attention.[1] Despite much patient study and the exhibition of great ingenuity no wholly satisfactory method has yet been devised. The variables due to local conditions are numerous; and experience teaches us that it is much easier to reject formulas presented as being misleading than to find one apparently

[1] The Interstate Commerce Commission upon its organization July 1, 1887, required the railroads to report operating expenses separately as between the freight and passenger services. The difficulties were so great and the results so widely discredited that the requirement was withdrawn as of June 30, 1894. The requirement was restored as of July 1, 1915. *In the Matter of Separation of Operating Expenses*, 30 I. C. C. 676. In the interval railroad accounting had in this respect made gradual advances. T. M. R. Talcott, Transportation by Rail (1904); *Buel* v. *Chicago, Milwaukee & St. Paul Ry. Co.*, 1 Wiscon. R. R. Com. 324 (1907); *Minnesota Rate Cases*, 230 U. S. 352, 458–461 (1912); 14th American Railway Engineering Association Proceedings, pp. 587, 1128–1135 (1913); *Western Passenger Fares*, 37 I. C. C. 1, 12–30 (1915): see M. O. Lorenz Railroad Rate Making, 30 Quarterly Journal of Economics, pp. 221–232 (1916); W. J. Cunningham, The Separation of Railroad Operating Expenses between Freight and Passenger Services, 31 Quarterly Journal of Economics, pp. 200–249 (1917).

adequate. The science of railroad accounting is in this respect in process of development; and it may be long before a formula is devised which can be accepted as satisfactory. For the present, at least, the question what formula the trial court should adopt presents a question, not of law, but of fact; and we are clearly unable to say that the lower court erred in adopting the method there pursued.[1]

The decree of the District Court is

Affirmed.

[1] The average rate of return for the years 1914–1917 according to the formula adopted by the trial judge was 1.20%. By the use of a formula more favorable to the defendant he found it to be 2.52%. The modified revenue train mile ratio used by the plaintiff showed a loss of over $100,000 a year; while the gross ton mile ratio proposed by the defendant indicated an average return of at most 5.82%. Of these methods employed by the parties it may be noted that the Interstate Commerce Commission has said:

"The representatives of the state commissions advocated the use of 'gross-ton-miles' as a basis, while the representatives of the railways favored 'engine-ton-miles.' The discussion seemed to be somewhat influenced by the possible effect of these respective bases on statistical evidence which might be introduced in passenger rate cases. It may fairly be said that the facts and arguments presented do not warrant the final approval by the Commission of either the gross-ton-mile or the locomotive-ton-mile at this time." *Rules Governing the Separation of Operating Expenses Between Freight Service and Passenger Service on Large Steam Railways, Effective July 1, 1915, p. 3.* These rules are now in process of revision.